Quality and Renewal 2011

Kvalitet och Förnyelse 2011 (KoF11)

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Preface

The first comprehensive evaluation of all research at a Swedish university, Quality and Renewal 2007, or KoF07 as a Swedish acronym, was carried out at Uppsala University in 2006–2007, following an initiative by the Vice-Chancellor, Professor Anders Hallberg, upon taking office. The primary objective was to identify strong research activities and research initiatives with potential to develop into future strong areas of research, thereby aiding the university management in its continuous strategic decision-making process. The present evaluation, KoF11, also initiated by Professor Hallberg, now at the end of his term, aims at gauging the development of research at Uppsala University by repeating the evaluation in the same way as it was carried out on the first occasion. This also offers an opportunity to review the measures taken as a result of the previous evaluation exercise.

The evaluation comprised two different parts. Firstly, a peer-review process, conducted by distinguished scholars of the international research community who were invited for a one-week site visit. Secondly, as a separate exercise, bibliometric studies of publications from Uppsala University in the period 2007–2010. In addition to the Web of Science-based citation analysis as conducted in KoF07, this time also a study based on the national Norwegian model using publication channel categories was carried out for the Humanities and Social Sciences. Preparation before the site visits was based on written material provided by the departments and made available a few months prior to the visit.

It is evident from the present report that there are many fields of strength at Uppsala University. Comparing with the KoF07 report yields a number of strengthened research activities owing to measures taken as a result of that evaluation, and in some cases quite likely also due to an increased general awareness of quality aspects in research. The evaluation also points at weaknesses and offers valuable advice on actions for successful development to be used in the years to come.

Experience from the previous evaluation ascribes a non-negligible value to the evaluation process itself. This is witnessed by quite a few people involved in the preparations for KoF07. The necessity of joining forces in a process where faculty members need to agree upon a common description of present status and future opportunities, and to formulate a common vision, is shown
to be both fruitful and creative. At the same time, one should acknowledge that an evaluation exercise of the present scope puts considerable strain on the departments to be evaluated, despite the efforts made to minimize this workload. Therefore, it is encouraging to note that in many cases our associates have regarded the exercise as an opportunity to sharpen strategies and express strengths and visions.

As the project manager I want to express my appreciation of the professional and competent work of the deans, heads of department, faculty members, and other personnel in carrying out the tasks that have been required from them. The panel chairs and experts have been deeply committed to the task, and their qualified assessment work and generous sharing of advice and good ideas is highly valued. Finally, the capabilities and friendliness of my collaborators in this project have made this work quite an enjoyable experience. In particular, the extraordinary administrative skills of Mr. Per Andersson have been instrumental in the successful undertaking and completion of this project.

Uppsala in October 2011

[Signature]

Joseph Nordgren
KoF11 (and KoF07) Project Manager
Executive summary

During the academic year 2010/11, an evaluation (KoF11) of the research at all faculties of Uppsala University has been carried out in order to assess the quality of research and to identify opportunities for renewal. The main objective of the evaluation exercise was to identify strong research activities in specific areas as well as in multi-disciplinary constellations and to offer advice on activities with potential to develop into new strong areas of research. A follow-up of how recommendations from the previous evaluation, KoF07, had been handled was also an objective. The evaluation was intended to provide the university management with reliable background material for the decision-making process and also to offer departments and faculties support in their quality development work.

The evaluation was conducted in a peer-review process, where distinguished scholars of the international research community were engaged in reviewing the research. As a separate exercise, two bibliometric studies for the period 2007–2010 were carried out. The first one, based on citation analysis, was conducted by Leiden University in the Netherlands. The second bibliometric study was done in-house and is based on the national Norwegian publication channel-based model.

The peer-review was based on written background material containing self-assessments, documents presenting facts and figures of department activities, and lists of publications. In order to acquire an in-depth opinion about the status and future plans of the various departments, all panels spent a week at Uppsala University conducting site visits, during which time they met and interviewed faculty members and PhD students. The review work was distributed across 25 different expert panels with an average of 8 panellists per panel, in total 192 panellists. Eleven panels were assigned to Humanities and Social Sciences, seven panels to Science and Technology, and seven panels to Medicine and Pharmacy.

Each expert panel was led by a chairperson who was responsible for the panel work and for the writing of a report expressing the conclusions and recommendations of the panel. Prior to the site visit, the panel chairs were asked to give their viewpoints on a tentative schedule of the site visit proposed by the departments. The chairs also had the opportunity to participate in the selection of panel members.
Executive summary

The panel report, which was written in a format defined by a template, was due in a draft form at the end of the site visit, and at an exit interview on the last day the main conclusions were presented by the panels to the respective department chairs. As far as possible, quality assessments were performed in terms of comparing with international standards as known and defined by the panel experts, using a set of recommended ratings: (1) *Top-quality* (world-leading level); (2) *Internationally high standard*; (3) *Internationally recognized standard*; (4) *Acceptable standard*; and (5) *Insufficient*.

Apart from direct research quality assessments, a number of different aspects were requested to be elucidated: (i) Research environment and infrastructure; (ii) Networks and collaborations; (iii) Opportunities for renewal and emerging science; (iv) Actions for successful development; and (v) Effects of the previous evaluation conducted in 2006/07.

In the 60 departments and units evaluated, some 500 research groups and activities were addressed and commented upon. The panels identified research activities of the highest quality level, *Top-quality*, in well over 30 departments distributed over all three disciplinary domains. The highest quality rating was given to more than 90 specific groups or activities.

A few departments as a whole were found to perform at a level no less than *Internationally high standard*. The number of cases for which panels discuss research activities or groups mentioning Internationally high standard is about 140. Furthermore, some panels judge research to be of very high quality without explicitly using the recommended quality ratings. The rating *Internationally recognized standard* is found in approximately 70 occurrences for different research activities. Mention of research of *Acceptable standard* is found in 30 cases, and in rare cases the panels discuss activities that are assessed to be *Insufficient*.

It should be reiterated that the main task of the panels was not to grade all research, but to identify particularly strong research, emerging science and opportunities for renewal. In effect, the departments had also made a sort of pre-selection of activities to be evaluated when compiling the self-evaluation and presenting research activities in a size-limited document.

The panels also discuss structural conditions and their implications for successful development. Some of these comments refer to recruiting and career issues such as tenure-track positions and career paths, mobility and visits abroad, inbreeding, gender issues, and mentorship. Another cluster of comments relates to research activities and dissemination; research vs. teaching load, fragmenta-
tiation and research focus, critical mass, qualitative imbalances, contacts and networks, and publication issues. Finally some panels have made comments regarding overall planning and infrastructure.

As a general observation one can note that the panels would like to see a more long-term perspective in the strategic planning, and a stronger focus on making priorities regarding future research directions. The panels find research groups that are of sub-critical size or do not exploit the opportunities present to form stronger constellations that could attract a more robust funding situation. From the panel reports one can extract some of their preferred prerequisites for achieving world-class research:

• Ensure a mixture of local and international staff, including PhDs.
• Encourage mobility, with ingoing and outgoing research visits.
• Focus research efforts on a few actively selected research areas.
• Collaborate extensively on the international arena (but do not forget local collaboration).
• Disseminate research results in prestigious publications and channels.
• Be aggressive, but selective, in pursuing external funding.
• Do not lock up all available basic funding in long-term tenure-track positions.

As a separate part of the research evaluation, researchers at Leiden University carried out a bibliometric study on department level of research publications from Uppsala University in the period 2007–2010. The study did not apply to all research areas since it required a sufficient number of publications in international journals indexed in the Web of Science databases in order to allow normalized citation scores to be calculated with reasonable accuracy.

The number of Web of Science publications was 7,038 (for 2007–2009). These obtained 44,673 citations during 2007–2010, self-citations excluded, i.e., on average they were cited 6.35 times. One quarter of the publications had not been cited at all, while 512 papers belonged to the five per cent most cited papers in their field. The impact of the research in relation to the research field(s), measured as the field-normalized citation score, was 1.39 for the University as a whole, i.e., Uppsala researchers had a 39% advantage over the world average. Above the University average were Biology (1.75) and Medicine (1.55), and below were Social Sciences (1.17), Chemistry (1.13), Physics (1.10), Mathematics and Computer Science (1.08), Pharmacy (1.07), Earth Sciences (1.02), and Engineering (1.00).
Executive summary

The bibliometric study also shows that Uppsala scholars on average publish in journals that have an impact that is 27% above the world average. Again there were variations between fields in the University. Above the total average were Biology (1.51) and Medicine (1.29), and below were Chemistry (1.26), Physics (1.26), Pharmacy (1.22), Engineering (1.20), Earth Sciences (1.17), Social Sciences (1.14), and Mathematics and Computer Science (1.04).

The articles included in Web of Science-indexed journals, and covered by the external citation-based bibliometric study above, are to a dominating extent published by scholars in the disciplinary domains of Science and Technology, and Medicine and Pharmacy. Researchers in the Humanities and Social Sciences on the other hand have larger shares among non-Web of Science articles, book chapters, books, edited books, reviews, and book reviews.

In a separate and internally conducted publication channel-based bibliometric study, the conditions for Humanities and Social Sciences are considered in a different way. This study, based on the Norwegian model, allows for a bibliometric analysis that also includes monographs and articles in anthologies as well as journal and review articles. The model focuses on the publication channel (i.e. journals and publishers) rather than citation frequency of individual publications. The relative proportion of publications published in or by ‘prestigious’ journals/publishers, as defined by a list of selected channels, is used as an indicator of quality.

The total number of publications in 2007–2010 from the Humanities and Social Sciences is 8,488. Of these, 3,012 are regarded as scientific publications according to the Norwegian classification, with 27.2% published through ‘prestigious’ channels and the remaining 72.8% through ‘normal’ channels. A comparison with the Norwegian universities in 2010 shows that 23.3% of all scientific publications in Norway were assigned to the prestigious level. Since the share of publications classified at this level is usually higher in Science and Medicine, and these are not included in our internal bibliometric study, the result for Uppsala University is quite satisfactory. The percentage of publications in the prestigious category also matches well the findings in the recent research evaluation at the University of Gothenburg, with a corresponding figure of 23.6%.
Part I: The Project

Introduction

Since the mid 20th century, research and higher education have become increasingly significant activities all over the world. They are often seen as a means to achieve economic growth and prosperity. As a result, the number of institutions for research and higher education has increased considerably, now more than 15,000 worldwide. Accordingly, the number of researchers and students has increased. This in turn has made resource allocation more complicated and in many countries led to efforts to evaluate research and higher education. In some countries, like the United Kingdom with its Research Assessment Exercise started in 1986, this has led to a relatively elaborate system for evaluating the standards of research and higher education.

In Sweden, evaluations of research started out in the late 1970s by the then Swedish Natural Science Research Council (NFR) starting evaluations of the various natural science disciplines. They were followed by similar evaluations carried out by the other research councils. The then Council for Research in the Humanities and Social Sciences (HSFR), for instance, undertook evaluations of economics, history and sociology. These evaluations by the research councils have continued ever since. However, they have not had any direct links to funding of research. Discussions within the government are nonetheless on-going regarding to what extent “quality measures” should be linked to the public funding of research. The concept of nationwide research evaluations, somewhat like KoF, is being investigated during 2011 and for a few years a minor portion of the government funding for research has been reallocated in relation to, e.g., bibliometric analysis.

Since the early 1990s, universities and university colleges have also been subject to evaluations by a central body, initially by the Office of the University Chancellor (Kanslersämbetet) and later in 1995 by the National Agency for Higher Education (Högskoleverket). The former organization evaluated the procedures for quality improvement, while the latter focussed on the quality of various disciplines. Although the quality evaluations were primarily directed towards educational programmes, the evaluation reports also referred to the quality of research.

In addition to these national initiatives, local evaluations of research in order to reallocate resources within individual universities have been undertaken, such as the BASTU project at Uppsala University.

In the same spirit, Vice-Chancellor Professor Anders Hallberg announced an overall evaluation of the research within Uppsala University as he took office in the summer of 2006. He thus proposed that the University Board launch the
Part I: The Project

project Quality and Renewal 2007 (*Kvalitet och Förnyelse* 2007, or KoF07). The University Board decided to go ahead with the evaluation, and the KoF07-evaluation did engage a large number of distinguished scholars from many different countries, putting considerable weight on site visits. The expert panels visited Uppsala during three different weeks in March, April and May 2007 and presented panel reports with conclusions and recommendations and also reviews of the quality level of research as judged in an international perspective and on a four-point scale (Top-quality/world leading, Internationally high standard, Internationally recognized standard, Acceptable standard). Some 500 research groups/activities were commented upon, about 10% of which were judged to be “Top-quality/world leading” and an additional 20% were considered to be of “Internationally high standard”.

With KoF07 Uppsala University was the first university in Sweden to conduct a self-initiated evaluation where all research activities were assessed simultaneously. KoF07 received considerable attention in both academic and political circles, both nationally and internationally. After KoF07, evaluations of similar structure were conducted at Lund University and KTH/Royal Institute of Technology (2008), SLU/Swedish University of Agricultural Sciences (2009), and at University of Gothenburg, Örebro University, and the Karolinska Institutet (2010). A second evaluation cycle can be said to have started with the present evaluation, KoF11, and Lund University will follow with a second evaluation in 2013.

This second overall evaluation, KoF11, follows the overall layout of the first evaluation in 2007. It also includes two advanced bibliometric studies that have been carried out as separate exercises independent of the assessment based on written documents and site visits. The main part of the present report comprises the panel reports that were produced after the site visits. However, before turning to these, the report will put the evaluation in context by briefly summarizing the Swedish system of research and some characteristics of Uppsala University. In addition, the project design is described, and some observations from the panel reports are presented and discussed. The full bibliometric reports appear in Part IV.
The Context of KoF11

The Swedish system in brief

The Swedish system for research can be said to be based on the Humboldt principle that research and higher education should go hand in hand. The number of research institutes is therefore very limited and research that is not pursued by industry is concentrated in universities and university colleges.

Currently, there are fifty-two institutions offering higher education in various forms in Sweden. Most universities and university colleges are public authorities, subject to the same legislation and regulations as other public authorities in Sweden, as well as to the particular statutes, ordinances and regulations relevant to the higher education sector. A number of universities and university colleges are self-governing and independent, obliged to follow the statutes, ordinances and regulations relevant to the higher education sector.

There are presently 16 institutions with university status, 14 of which are public and 2 are independent (Chalmers Institute of Technology and the Stockholm School of Economics). Uppsala University and Lund University are the oldest, founded in 1477 and 1666, respectively. In the late nineteenth century, they were followed by the colleges, later universities, in Stockholm (1878) and Gothenburg (1891), and in the twentieth century an additional six universities were founded (Umeå, Linköping, Karlstad, Mid-University, Växjö and Örebro). Furthermore, there are six stand-alone institutions with university status: three institutes of technology, a medical school, a business school and a university of agriculture and forestry. Universities have degree awarding power in the first cycle (University diplomas and Bachelors’ degrees), second cycle (one-year and two-year Master’s degrees), and third cycle (licentiate and doctoral degrees). In addition, they have entitlement to direct government funding for research.

Sweden is among the nations worldwide that allocate the most money to research and development (R&D) in relation to its gross domestic product (GDP), almost 4%. This amount continues to grow. The business and corporate sector accounts for around 75% of the research spending, concentrated in a small number of multinational companies, such as ABB, AstraZeneca, Volvo and Ericsson. Research institutes account for only a small share, as already mentioned, which distinguishes Sweden by international comparison.

The public sector finances R&D through grants paid directly to higher education institutions (HEIs) and through support via research councils and sectorial research agencies. In addition, several research foundations have been established with public funds, providing research funding in excess of SEK 1 billion annually. The Swedish Parliament grants R&D funds in all of the ministries’ areas of responsibility. By far, most publicly funded research in Sweden is conducted in HEIs, see Table 1.
Table 1. R&D funding by the Swedish Government 2010, billion SEK (ca.).

<table>
<thead>
<tr>
<th>Source of Funding</th>
<th>Amount (billion SEK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directly to HEIs; universities, etc.</td>
<td>14</td>
</tr>
<tr>
<td>Through research councils and sectorial research agencies</td>
<td>8</td>
</tr>
<tr>
<td>Other ministries’ than higher education</td>
<td>6</td>
</tr>
<tr>
<td>To defence agencies</td>
<td>2</td>
</tr>
<tr>
<td><strong>Government funding for R&amp;D, total</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

The research councils mainly support basic research. Sectorial research agencies fund R&D aimed both at meeting the knowledge needs of individual sectors and at fostering the development of society. In all, Sweden has some 20 sectorial research agencies with resources for R&D. County councils and municipalities also fund research, mainly in health care and social services.

In addition to public sources of funding, Sweden has private funding sources, foundations, and fund-raising organizations. Several are major stakeholders in the research sphere and provide substantial grants for research in their respective fields. Collectively, private non-profit organizations contribute SEK 2 billion per year to Swedish research.

The trends for the basic research funding have been that the government has moved from a system with very specified direct grants to one in which the direct grants are less specified but decreasing relatively. At the same time, there has been an increase in project grants. This started out in the 1940s when Councils for Research were established.

In the year 2000 these research councils were merged into one body, the Swedish Research Council (Vetenskapsrådet). In addition to this organization, there are a number of other bodies financing research as mentioned above. The Swedish Government research policy has developed in several steps since the 1980s:

(i) An expansion of strategic research funding, to improve university–industry collaboration and to promote new organization forms for academic research, mainly large-scale centres with an international profile;

(ii) The above-mentioned reorganization of public research funding by the creation of a joint basic research council (the Swedish Research Council) and an agency for innovation support (VINNOVA); and

(iii) A decrease in block funding to universities, coupled with growing demands that universities should develop more coherent strategic plans and priorities.

This development reflects, some would argue, a general distrust of the universities’ ability to use increasing resources in a strategic, proactive manner and make sharp priorities. Instead, additional support to academic research has been channelled through external funding, and this increasing share of external funding has been viewed by the Government as important for quality assurance in
In recent decades, there has been a gradual increase in the importance of external funding. In the 1980s, external funding accounted for 20–25% of the total research budgets at the major Swedish universities. Currently, slightly more than 50% of research funding is external (public or private), while for some departments/fields it is more than 75%. A bone of contention in project funding, particularly regarding private foundations, has concerned overhead costs.

In recent years, the emphasis on external funding in general has been complemented by an orientation towards targeted support of "strategic research areas", with a large Government call in 2009. To get funding under this call, universities were supposed to team together in larger constellations. Uppsala University received funding in 10 different strategic research areas (in 7 as lead partner), involving all our disciplinary domains and for the period 2010–14.

In terms of recruiting, it is important to note that the Swedish procedures for recruitment differ somewhat from those of other countries, particularly the United States. First of all, there is no tenure track system. Instead there is a double career system with one track (tenured lecturers), primarily directed towards teaching, and another track (tenured chairs, and previously also non-tenured post-doctoral positions for four years) with research and teaching. Along the first track, lecturers may apply for promotion to professor when they have reached the qualifications to hold a chair. The promotion does not automatically give research time, however. Instead lecturers and promoted professors are generally supposed to apply for research funding through the different funding bodies mentioned above.

It should also be borne in mind that departments are not expected to take too much of an active role in the final selection among applicants for academic positions. They work out the definition of appointment profiles, and thereafter in a rather formal procedure, based on evaluation by external experts, the candidates are selected.

As of January 1, 2011, a new ‘Higher Education Ordinance’ and a ‘Higher Education Act’ are in effect in Sweden. The universities are given increased freedom to decide on various matters that used to be centrally regulated by law. For instance, the earlier four-year postdoc research position (forskarassistent) was an important career step, but in its present form it will now be terminated. Only professor and lecturer positions will be centrally regulated, and instead regulations regarding several positions, as well as the hiring procedures, will be established locally, at the individual universities. Provisional regulations are effective during 2011 while negotiations take place on the national level to try to establish a framework for positions at the various universities, especially limited-term positions.

To sum up, Uppsala University is one of 16 Swedish institutions with university status. It is acting in a system in which academic teaching and research are
kept together. Recently, funding bodies have tended to concentrate resources through the provision of larger grants, and the Government has given the university increased freedom to decide on various matters.

Uppsala University in brief

Being the oldest university in Northern Europe, Uppsala University has long traditions and has played an important role in the higher education and research in Sweden. At its foundation in 1477, the teaching was directed towards philosophy, law and theology. Teaching lasted a few decades into the sixteenth century, but ceased for most of the remaining part of the century. In the seventeenth century, donations from the King, Gustavus (II) Adolphus, provided improved conditions for the university and a renewal occurred, particularly marked by activities in medicine and the natural sciences by professors like Olof Rudbeck. In the early decades of the eighteenth century, the natural sciences became even stronger with subsequently well-known professors such as Anders Celsius, Carl Linnaeus (Carl von Linné) and Torbern Bergman. In the early nineteenth century, this epoch was followed by an increased emphasis on the humanities, and in the latter part of the century, by an expansion in medicine and the natural sciences. In this period, several new institutions were created: the Observatory (1853), the Chemical Laboratories (1859), the Hospital (1867) and the University Building (1887).

Uppsala University counts as its alumni a large number of eminent persons, in, e.g., politics, culture and innovation, besides those who started their research career here. Eight Nobel laureates are connected with the university: Allvar Gullstrand and Robert Bárány (in medicine), The Svedberg and Arne Tiselius (in chemistry), Manne Siegbahn and Kai Siegbahn (in physics), and Nathan Söderblom and Dag Hammarskjöld (the Nobel Peace Prize).

It was not until after the Second World War that any real growth in the number of students was seen. In the 1950s, the number of students was 5,000, and in 1970 it was 21,000. Presently, there are more than 40,000 undergraduate students and 2,000 graduate students. At the same time, the different disciplines in the university have developed considerably and a number of new disciplines have been introduced.

In terms of the present organization of the university, its top management consists of the Vice-Chancellor, the Deputy Vice-Chancellor and the University Director. The first two are selected through a collegial process within the university, while the University Director is recruited on the labour market. The Government appoints the Vice-Chancellor after a proposal from the university. The Deputy Vice-Chancellor and the University Director, on the other hand, are appointed by the University Board (Konsistoriet). The latter presently has a majority of Government-appointed members, eight persons, while faculty members are represented by four, among them the Vice-Chancellor, and the
students by three persons. In addition, representatives of the three labour unions have the right to be present and to speak.

The chairperson of the board used to be the Vice-Chancellor, but this system was changed in 1998 when the then Social Democratic Government decided to appoint external individuals as chairpersons. Since a new Government took office in 2006, universities and university colleges did obtain the freedom to select board members themselves and to have these selections confirmed by the Government.

In addition to the Board, the Vice-Chancellor, the Deputy Vice-Chancellor and the University Director, Uppsala University has had three Vice-Rectors for almost fifteen years. They are elected among peers and have the responsibility for the disciplinary domains of (i) Humanities and Social Sciences (Faculties of Theology, Law, Arts, Languages, Social Sciences, and Educational Sciences), (ii) Medicine and Pharmacy, and (iii) Science and Technology. All in all the university has nine faculties and some 60 departments. They have together about 5,500 employees, 550 of whom are professors, with an additional 3,000 involved in teaching and research.

The total annual budget of the university presently is SEK 5,100 million (€ 550 million), 65% of which is allocated to research and graduate education. The budget allocated to undergraduate education is spent on delivering an average of 23,000 FTE (full time student equivalents) per year – corresponding to 45,000 individual students – within some 55 programmes for beginners, 59 master programmes, and some 1,900 single-subject courses. Of these, 34 master programmes and 370 single-subject courses are taught in English. The budget allocated for research and graduate education, in turn, annually results in about 5,000 scientific publications and some 300 doctoral degrees.

In order to stimulate quality in education and research, the university has student exchanges with nearly 500 universities and approximately 3,000 international collaborative research agreements throughout the world.

Uppsala University can thus be said to have long traditions and has, over the centuries, undergone many transitions and changes. From a small institution primarily focusing on philosophy, theology and law, it is today a multidisciplinary organization with a considerable number of students and employees. It is producing a substantial number of graduates and research publications through extensive international collaborations.
The KoF11 Project

Introduction

The KoF11 evaluation is in line with most of the strategies listed in the “Goals and Strategies for Uppsala University” to become a university of excellence. The primary goal of KoF11, as for KoF07, was to identify strong areas of research and successful research constellations at Uppsala University. Furthermore, it aimed at finding emerging science and identifying opportunities for new research by probing the standing of research at Uppsala University in national and international perspectives. For KoF11, an additional goal was to follow up on the recommendations and conclusions in KoF07 and how these had been handled at various levels within the university. The evaluation was not primarily aiming at comparing different disciplines within the university.

The evaluation was set to provide means to strengthen the quality of the scientific activities by offering reliable background material for the decision-making process for future strategic projects. It would also offer departments and faculties support in their own work on formulating plans for future research. Probing renewal and innovation in academic research is generally more difficult than assessing past performance. It is, however, a most important task, not least since numerous retirements of senior researchers are foreseen in the years to come. The results of the assessments of the expert panels on opportunities for renewal are therefore expected to be of vital importance for the strategic planning of research at the departments. It will offer departments and faculties support in their work to continue to encourage, develop and provide backing for good research.

The evaluation was carried out in two parallel, and as far as possible independent, tracks. The first track was based on peer review in which the invited experts during a week visited departments and groups to get a comprehensive view of conditions, activities and achievements in research. The second track consisted of a bibliometric analysis in which the scientific output in different departments was measured, in the form of publications and of citations of these, compared with the corresponding subjects/fields in an international perspective.

During KoF11 almost 200 international experts from 20 countries, and in 25 different panels, evaluated the research in the university’s 60 departments. Each panel consisted of a chairperson, a Swedish panellist from another university (to bring knowledge of the Swedish research system) and 4–9 other experts. 28% of the panellists were women, and 23% of the panellists in KoF11 also took part in KoF07.

After assessing the procedures in carrying out KoF07, it was decided that KoF11 should follow the same general layout. One difference is that the panel chairs were selected and invited earlier, up to 10 months before the site visits,
and they also had the opportunity to take a more active role in selecting the members of the panels. The overall time schedule is presented in Figure 1, and in the following subsections, the different steps are described in further detail.

Project organization

Project management
The project was launched by the Vice-Chancellor after approval by the Board of Uppsala University (see Figure 2). It was managed by a project management team with the following members:

Project Manager: Professor Joseph Nordgren, Vice-Rector for Science and Technology
Evaluation Office:
Project Coordinator: Mr. Per Andersson, MSc, Office for Science and Technology
Web Portal Administrator: Dr. Marcus Agåker, Department of Physics and Astronomy
Bibliometrics Coordinator: Mr. Leif Eriksson, University Library
Publication Editor: Dr. Björn Sundquist, Office for Science and Technology

The University Management constituted a reference group for KoF11. For the external panel visit administration the project team was supported by Academic Conferences (Akademikonferens), a joint organization between Uppsala University and the Swedish University of Agricultural Sciences. In addition, the university administration provided staff who accompanied the different expert panels during the visits at the departments, so-called panel guides.

The major work effort was carried out by individual researchers, groups, and management at the departments as they analysed and compiled the data sent to the panels beforehand. They also prepared and made presentations of their research activities during the site visits.
Method of evaluation
The background material contained self-assessment documents, facts and figures of department activities, and lists of publications. The extended site visits were considered necessary in order to acquire an in-depth opinion about the status and future plans of the various departments and research groups.

The review work was distributed across 25 expert panels with an average of eight panellists in each panel, in total 192 panellists (another five panellists had to withdraw, for health reasons, shortly before the site visit). 11 panels were assigned to Humanities and Social Sciences, 7 panels to Science and Technology, and 7 panels to Medicine and Pharmacy.

The result of the bibliometric studies was not made available to the panels. It was instead the intention to get an independent comparison of the quality ratings as represented by the two different methods, peer-review and bibliometrics. In addition, the trust in the validity and applicability of bibliometrics varies between disciplinary areas, which was another argument for separating the two different kinds of evaluation.

Each expert panel had a chairperson who was responsible for the panel work and for the writing of a report summarizing the assessments and conclusions of the panel. Prior to the visit, the panel chairs were asked to participate in selecting the panel members, and to give their viewpoints on the tentative schedule of the site visit proposed by the departments. A panel report was written in a format defined by a template, and the main conclusions were presented by the
panels to the respective department chairs at an exit interview on the last day of the visit.

Project portal
The project used an Internet portal in order to collect and distribute information to departments and panel experts, as well as providing a means to host an evaluation specific web page. The portal tool used was Designtech’s Project-Coordinator® X. This is a project coordination tool specially developed to handle large projects with many collaborators located at geographically dispersed sites. The portal operates through a web-based interface where a login page, with the option to have a more extensive public web page, gives access to a secure environment on a server where documents and other information can be stored and accessed.

A public web page provided general information in Swedish and English about the project; such as a general description of the evaluation process, the time plan and project organization, department division on panels, panel members, etc.

An internal web page provided specific information and instructions as well as links to downloadable documents. Panel members could access the portal and the self-evaluation documents. Other documents like Terms of reference and a Panel report template were provided on these pages (see further below). Panel chairs could access the working mode of the portal to allow uploading of documents, which was not used to a large extent, however. The other panel members could only access the internal home page and view the information provided there and access the documents through the links.

The project portal offered an efficient means to collect and distribute information and documents. It facilitated the work of the panellists in terms of reading background material as this was available from any location with Internet access.

Defining units for evaluation
The basic unit for evaluation was a department, as the department is the legal unit in the university organization and thus suitable for handling the various phases of the evaluation process. A formal decision structure is needed, since formulating a condensed written presentation that describes the research profile of a department may require elements of negotiation, as a department comprises several quite independent research groups. In several cases, the research profile of a department turns out to be too scattered to make a department unit a suitable choice. Instead, subsections of some departments have been grouped together with other departments to form suitable clusters of units for evaluation by a certain expert panel. In other cases where departments are more homogeneous, several departments have been grouped together in a cluster.
Evaluation package

The evaluation was designed to optimize the relation between information value and work load for the departments, and to provide a condensed and informative background material for the panellists prior to the site visits. In particular, it was designed to stimulate a process where faculty at the departments would work together to arrive at a common description of on-going research at the department, as well as to formulate visions for the future. It is envisaged that this process in itself would be a beneficial component in the quality development work.

Three sets of documents were prepared and provided to the panellists: (i) a self-assessment exercise; (ii) a document presenting a number of quantified quality factors; and (iii) a document presenting facts and figures. The forms of these documents can be found in Appendix A.

Part A: Self-assessment

The first document comprised a written description of on-going research activities and plans and visions for the future, as a self-assessment by the departments. In order to achieve condensed written material, the amount of text was limited in proportion to the number of full time equivalent (FTE) researchers for each department. Also a limited number of publications – or other research outputs – were to be selected and listed, representing research activity and renewal. Comments on how recommendations from the KoF07-evaluation had been handled should also be presented, as well as other effects following the previous evaluation. In addition, the entire publication list was available to the panels through the Uppsala University Academic Archive On-line, DiVA.

Part B: Quantified quality factors

The second document contained an account of achievements, assignments and other factors that can be assumed to express a degree of quality. Furthermore, these factors were accounted for in terms of frequencies, so that, for instance, the number of plenary talks at international conferences or extensive research visits abroad were stated. The detailed lists were not given, but could be asked for by the panels. Even though each individual factor (or indicator) should not be ascribed very high importance, the over-all picture may provide some hints to the quality level of the research at a department.
Part C: Departments – facts and figures
The contents of the third document were extracted from the common data bases at the university. It offered a brief account of the situation at the departments with respect to staff, research exams, publication rates and economic conditions.

Number of staff was given in terms of full time equivalents (FTE) for the categories chair professor, promoted professor, senior lecturer, researcher, postdoctoral staff + assistant professor, doctoral student, and other staff. Information about the fraction of research staff was also provided. Total number of employees at the departments was presented as well as average age and percentage of females for the different categories of staff. All figures were given as of January 2011.

The account for research exams concerned PhD and Licentiate exams, annual average for 2005–09 and totals for 2010. Fraction of women, age upon completion, and gross and net study time were also presented.

The publication rates at the departments were provided with a division into different categories, i.e. monographs, journal articles, conference proceedings, etc. Annual average figures for 2005–09 and total number for 2010 were presented.

The economic conditions of the departments were presented in terms of total revenues, total costs, and revenues and costs for a few major categories like undergraduate teaching, direct funding of research and research education, external funding for research, and personnel costs and operating costs. Figures for 2010, after closing of the books, were provided.

Terms of reference
The anatomy of the KoF11 research evaluation was described in the Terms of reference document (see Appendix B). It was used as a steering document for the expert panels. The document was supposed to be read together with the documents Evaluation documents A, B and C (Appendix A) and Instructions to departments for the planning of panel site visits (Appendix F).

The Terms of reference document gave a background to the evaluation exercise, stated the objectives and described the method adopted. It furthermore presented evaluation criteria and the recommended mode of work of the panels. The quality ratings to be used in the document were defined in terms of relative standing with respect to international comparison, and recommended ratings were Top-quality; Internationally high standard; Internationally recognized standard; Acceptable standard; and Insufficient.

The application of the quality ratings was to a high degree based on the knowledge and definitions of international standings of the panel experts, as they were experienced evaluators at the international level. As the main objective of the evaluation was to identify strong research and interesting opportunities for renewal, it was not mandatory to grade all research, although the panels were asked to comment on actions for development. They were asked to address activities with clear potential for improvement. As the unit of evaluation
was department rather than individuals, the panels were asked to qualify the extent of activities in the respective rating.

The document also described the working arrangements of the expert panels, the particular responsibilities of the chair and other matters of importance for the evaluation task such as confidentiality and trust.

**Panel report template**

A template for the individual panel reports was provided in order to achieve a sufficient degree of conformity between the different panel reports, and to make sure that the most important set of questions was addressed by the panels (Appendix C). The items that the panels were asked to comment on were:

- General assessment of the department/unit
- Quality of research
- Research environment and infrastructure
- Networks and collaborations
- Opportunities for renewal and emerging science
- Actions for successful development
- Effects of the KoF07-evaluation
- Other issues

**Selecting experts**

The strategy for the recruitment of the expert panels was to have a number of all-international panellists complemented by one member from another Swedish university than Uppsala, preferably from a research field adjacent to the central field of the panel. The panel chair should be a very well-recognized generalist researcher with high degree of integrity and experience.

The assignment of expert evaluators for academic research is a delicate task in the sense that panellists should have a high degree of competence and skills along with integrity, and trust by the researchers to be evaluated. Therefore, the procedure to select experts needed support among faculty members and yet resist claims of challenging issues. The method adopted worked through invitations from deans to departments to nominate evaluators according to a search profile. The nominees were screened by the project management with respect to challenge issues, and in only a few cases were nominees found to be disqualified due to too close associations. A document defining the specified requirements for scholars to be nominated is found in Appendix D.

To cover the various research directions and special fields represented by the departments and groups assigned to a particular expert panel, between 6 and 11 panellists were engaged in each of the 25 panels. The over-all acceptance rate for invited panellists was 50% and for panel chairs slightly higher. Variations between panels were considerable. It can be noted that the acceptance rate for
women was ca. 10% lower, for all types of panel roles. 28% of the panellists were women, compared to 23% in KoF07. 40% of the panellists were from Scandinavia (except Sweden), 32% from Europe outside of Scandinavia and 16% were from non-European countries. 23% of the panellists in KoF07 also participated in KoF07, though in some cases in other roles. The selected panel experts are presented in Appendix E.

Site visits

In order to assess strengths and weaknesses, and in particular potential strengths and weaknesses, it was considered a vital ingredient in the evaluation to allow panel experts to devote enough time to department visits. Therefore, an extended site visit was planned, also since it was planned for the panels to write their report during the visit. In general, the panels submitted a draft report before leaving, and the final report was delivered two weeks after the visit.

Each of the 25 expert panels paid a one-week visit to Uppsala University, with five working days besides the arrival day (see Appendix F, last page). The visits were organized in two different work weeks, May 9–13 and May 16–20, 2011. A preparatory meeting with the panel chairs and the Swedish panellists was held on the evening of the arrival day, Sunday. This meeting allowed the evaluation management to introduce the chairs to their role as leaders in the evaluation process, as well as to offer the chairs a possibility to discuss and to be updated on new information.

For the panel members, the site visit started on Monday morning with an introduction to the evaluation process. After lunch, presentations of the faculties were given by the vice-rectors and deans, and the panels were then given time to plan their visits during the week. At this internal meeting of the panels, the respective panel guide from the university administration was present.

Tuesday, Wednesday and Thursday were devoted to department visits and internal panel meetings. The detailed time schedules for department visits were worked out by the departments in communication with the respective panel chair.

The last day of the visit included a final internal meeting of the panel to finish the draft of the panel report. In the last part of the meeting, department chairs and deans were invited to an exit interview, where the panel chair gave a summary of the findings, conclusions and recommendations of the panel. The site visit was then concluded for all panellists except for the chairs.

A separate meeting with the panel chairs was organized on Friday afternoon. The University management was invited to this meeting as well as the faculty and section deans. The objective was to bring up issues of multi-disciplinary and cross-faculty nature that might not have been attended to in a satisfactory way and also to offer a further opportunity for the deans to discuss with the panel chairs about matters relevant to their respective areas.
Bibliometric studies

As a separate part of the research evaluation, a bibliometric study of research publications from Uppsala University in the period 2007–2010 was undertaken. The study was carried out by external expertise, the CWTS at Leiden University. The expert panels were not provided with the results of this study, and in fact the study was mainly conducted after the submission of the panel reports.

The separation of the bibliometric exercise from the peer-review evaluation was deliberately chosen in order not to bias the assessment work of the panels. Furthermore, the validity of bibliometrics varies among the different disciplinary areas of research, owing to the varying publication traditions. In this discussion there is no disagreement that the output of publications constitutes a reasonable measure of performance. The differences in points of view concern the channels for publications, and how these differences should be handled. While journal articles in English constitute the main form of publication in the natural sciences and medicine, articles and books in other languages than English are a common form of dissemination of ideas among scholars in the humanities and in several fields of the social sciences.

Since only ca. 10% of the publications from the Humanities and Social Sciences at Uppsala University are articles in Web of Science-indexed journals, traditional bibliometric studies (as in KoF07) will be of little value for these fields.

In KoF11 it was decided to make an additional bibliometric study using the national Norwegian model for these research fields. This method focuses on the publication channel (i.e., journals and publishers) rather than the individual publication, and the channels are classified in different levels.

Quality measures can then be based on other aspects, such as number of publications (including anthologies, monographs, etc.) in relation to available resources, e.g., number of researchers, research funding, or proportion of publications in prestigious channels (level 2).

The results of the bibliometric studies are presented in Part IV.
Part II: Summary of the results

Expert panel evaluation

In the report of the previous KoF07 evaluation a summary of each panel report was presented. Although best efforts were made to make short and representative summaries, the manner in which pieces of information from the panel reports were selected could to some extent contribute to the overall impression of the panels’ judgements. It would be even more difficult this time to make a condensed summary without risking such skewing effects. In this summary we have thus chosen to concentrate on general conclusions extracted from the panel reports, comments from the joint meetings with panellists and chairs during the visit week, and impressions on changes in relation to KoF07. It is therefore very important for the reader of this report to go to the individual panel reports for the full picture. The final panel reports are presented in full in Part III of this document.

In this second KoF evaluation we find that the panels in general have spent more time formulating detailed conclusions and recommendations for the individual research groups. Less time has been spent commenting on overall issues and problems (national or university level). As a result of this, the panel reports, in total, comprise some 100 more pages than in the KoF07 report.

General observations

Introduction

For a summary of the peer-review ratings, and a comparison with KoF07, see page 66. Mostly, the rating for the individual groups/activities and the associated comments were comparable between KoF07 and KoF11, not surprisingly as pointed out by one of the Science and Technology (ST) panels:

In science, four years is a relatively short time for dramatic improvements.
The panel was therefore not surprised that many of the comments made by the panel of KoF07 were still valid as such.

However, a number of activities were given a higher rating than in KoF07, in not a few cases as a result of actions initiated in light of the previous evaluation. It is not always possible to compare the results directly, however, since many groups have other prerequisites in 2011 than in 2007. They might have been merged, relocated or newly initiated. The panels have been somewhat more detailed when it comes to rating subunits (e.g., “the overall rating of the depart-
Part II: Summary of the results

ment is on level X, however group Y is clearly at a higher level and activity Z is of top-quality”).

This more detailed rating was clearly encouraged in the Terms of Reference for KoF11. If the panels would have to make just one grade for the whole department it would have been a mean value, easy to grasp and compare at the university level but of little value for the department itself, and its future development. This also means that grades are relating to activities of different volume, and total numbers of certain grades cannot be directly compared, between panels in KoF11 or between KoF07 and KoF11.

A number of activities received a lower rating in KoF11 than in KoF07. In some cases this generated strong feelings, as such a group might feel that they had progressed since KoF07. There are several possible reasons for a lower grade; one that other activities within the same field had progressed even faster and further (the comparison was supposed to be in relation to international standing of the same fields 2011 and not in relation to the result of KoF07). The panels point to some other explanations for why a rating could be different for KoF11 as compared to KoF07:

The slight change in quality assessment of the division most likely reflects the change in the evaluation panel rather than a change in the actual standing of the work. (ST panel)

As mentioned above, 23% of the panellists in KoF11 also participated in KoF07, on average two members in each panel. This ensured some degree of “panel memory” and in some cases made a clearer comparison between the two evaluations possible.

It should be reiterated here that the main task of the panels was not to grade all research, but to identify particularly strong research, emerging science, and opportunities for renewal in the material presented to them. In fact the departments themselves made a sort of pre-selection, since they compiled the self-evaluation describing research activities and made the draft for the panel visit schedule. It was not compulsory to present all research activities, and the limited space available for the self-evaluation makes it likely that not all activities were presented.

It has also to be noted that the panel reports vary in terms of how distinctly they are grading the evaluated activities, though in overall terms the grading is more expressive than in the KoF07 reports. Most panels are very clear on giving grades to departments and research groups, while others provide more general subtle assessments. As in KoF07, a few panels have been particularly reluctant to use grades, and have found it difficult to apply the recommended quality ratings. As pointed out by two panels in the Humanities and Social Sciences (HS):

[…] the members are not convinced that the setup of the evaluation allows us to formulate a well-founded judgment on the substantial quality of research, at least not within the humanities.
It is difficult to measure research in the humanities along the same lines and norms as are customary in the sciences, but the panel has even so followed the instructions given by the evaluation project.

Several panels pointed out that they had worked as a team during the site visits and not acted in sub-panels, as encapsulated by one of the ST-panels:

> It is important to note that, while members of the panel have their individual competency areas, this report of panel [...] is based on the collective judgement of all the members of the panel - as encouraged in the terms of reference for the evaluation. All members of the panel took part in both discussing and writing the evaluation for each of the divisions and centres. Thus, the report should be read as reflecting the views of the panel as a whole, and not simply as the sum of a series of individual reports reflecting the views of specific panel members with specific research interests.

The panels paid considerable attention to the renewal aspect of the evaluation. They were well aware of the prevailing age-heavy demographic profile, and they often chose to see this as an opportunity for renewal. Thus, in several cases they suggest that upcoming retirements be used to strengthen existing efforts or to redirect research.

Some panels submitted their reports before their departure from Uppsala, although most used the option of taking another two weeks for additional editing. Each department was given an opportunity to comment on its report, and this led to minor revisions with respect to factual errors or misunderstandings.

Discussions with panel members revealed some difficulties on their part in understanding the institutional setting of the Swedish system, particularly the procedures for recruitment and funding. However we believe that such difficulties were less frequent in KoF11, possibly due to the fact that most panels had a few members that also took part in KoF07 and the presence of a Swedish non-Uppsala panellist in each panel. There was still some confusion related to the fact that translations of titles (into English) varied among and even within departments.

The panel reports reveal a number of critical remarks on conditions governing the university system as they appear at Uppsala University, although they are likely to be relevant also for other universities in Sweden. These will of course provide important information for the relevant research groups and their leaders in the university hierarchy. Two panels made specific comments on the university’s internal organization:

> Uppsala University appears to be burdened by too many layers of management: The Rector, the Vice-Rector for a domain, the Faculty, the department, and even sometimes layers within the department. That makes for about five layers between top and bottom, which appears to be excessive and not a product of any rational process of planning. (HS Panel)
A recurrent observation made by our panel during this evaluation week is that the administrative structure of the university appears unnecessarily complicated. This must almost certainly create complications in terms of the internal management and the decision making process, but it also projects a blurred and confusing image for the outsider who is in search of information. (ST Panel)

In the following, a number of remarks of general character are brought up to illustrate the comments from the panels. They can be divided into three groups:

- Recruiting and career
- Research activities and dissemination
- Overall planning and infrastructures

**Recruiting and career**

As in KoF07 a common theme in the panel reports concerns the possibilities to recruit and nurture well-qualified scholars. The upcoming generation shift is not mentioned as often as in KoF07, instead comments are concentrated around issues relating to the individual researcher’s hiring and career but also some overarching issues on a higher level:

- Recruitments and international atmosphere
- Tenure-track positions and career path
- Mobility and visits abroad
- Inbreeding
- Gender issues
- Mentorship

**Recruitments and international atmosphere**

Regarding recruitment of non-Swedish staff (postdoc, PhD, and lecturers/professors) some comments pointing out weaknesses are:

We agree that the lack of international, or at least Nordic announcement of vacant positions, may have disadvantages. An alternative to recruiting internationally to regular positions is to establish an approach to attract internationally reputed scholars on a part-time basis. (HS Panel)

The Panel was surprised by the small number of international PhD students. Student mobility is connected with visibility. An attractive image is important. The […] Institute could serve here as a vehicle for enhancing the international visibility of the strong graduate programs that exists in Uppsala and in Sweden more generally. (ST Panel)
Part II: Summary of the results

Most of the PhD students, however, are from Sweden and in particular undergraduates from Uppsala University. In the current stock of PhD students […] 20 per cent are from abroad. This is an improvement since KoF07, but a larger proportion of good foreign students could have a positive impact on the quality of research at the department. This would require a more extensive promotion of the doctoral program abroad and a more intensive selection process. (HS Panel)

But there are also comments commending the situation in other departments:

Over 50% of scientists are from abroad, and this brings along an international atmosphere, which is always beneficial in science. (MP Panel)

We note with satisfaction the positive working environment and conditions for doctoral students, and that access to doctoral positions appears to be entirely non-discriminatory in regard to non-Swedish students. (HS Panel)

In general, the situation regarding foreign visiting scholars seem to have improved since KoF07, and the comments regarding this are generally positive, for example:

The level of interaction exhibited by this program is impressive. There is without question a strong international flavor to the program as a whole, with students, postdocs, researchers, and professors representing a broad cross-section of the international scientific community. A particularly striking aspect of the program is the extent to which this group has endeavored to bring in rotations of individuals from various groups for multi-month periods. (ST Panel)

In addition, the […] group builds its international networks by hosting visitors from abroad who visit repeatedly for varying (but short) periods of time, and whose collaboration with the […] group’s researchers is evident in the publication portfolio. […] The […] group also invites leading scholars for short visits, and seems to be increasingly strategic about selecting these visitors […] Uppsala’s status as a leading centre of […] research makes it an attractive institution for top scholars in the field. (HS Panel)

Following recommendations in 2007, the department has brought in several senior visiting professors on 5–25% salary costs, who provide teaching and, especially, co-direction of PhD research and some research. The visiting professors in several cases have helped to enhance the scientific level. This, and planned scholarships for overseas students, may help the
department develop further its European collaborations and funding, and especially, wider links with institutions outside Europe. (ST Panel)

Tenure-track positions and career path

The earlier four-year postdoc research position (forskarassistent) is being terminated in its present form as the new Swedish ‘Higher Education Ordinance’ is effective from January 2011. Only professor and lecturer positions will be centrally regulated, and instead regulations regarding several positions, as well as the hiring procedures, will be established at the individual universities. A national framework for certain, especially limited-term, positions are still under negotiation. These, and other, circumstances invoked a number of comments and concerns from the panels:

During our meetings we have noted that the Swedish system of job classification as researchers or postdocs, assistant professors, associate professors, promoted professors and full professors has severe shortcomings. First, the teaching load is very unevenly distributed as the associate and promoted professors are full time teachers unless they receive research grants. Second, the system does not offer a straightforward career path. This causes uncertainty among young researchers and is strongest in the case of foreigners and female researchers. As a result, it may get them to pursue other goals than a career at Uppsala University. (HS Panel)

The issue of how to give younger scientists a chance at what could be called true tenure-track positions that can also be competitively advertised in an international arena remains a problem that was discussed in KoF07. The basic issue is the evidently increasing degree to which a significant fraction of a younger scientist’s, or even a promoted Professor’s, basic salary has to come from external research funds. This leads to a situation in which the way forward for younger people who desire an academic career is not clear, and in which the university is also hindered in being able to recruit broadly and in an international context for new positions. There is also an uneven character of this support across the divisions in […]. However, this issue goes beyond […] and impacts the entire university, if not the whole higher education system in Sweden. We thus recommend action at the highest local and national levels to try to remedy this. (ST Panel)

[…] is an excellent example of the successful recruitment of a very talented scientist from abroad […] The review panel was surprised, however, to learn that Uppsala University is not providing a tenure track option upon the employment of such a scientist. In the long run, the lack of a tenure track option - e.g. decided upon by international evaluation af-
ter five years - will seriously harm the global competitiveness of Uppsala University, not only but particularly in the area of [...]. As part of the university’s newly obtained autonomy, it should urgently establish such a process. (MP Panel)

For the postdoc researchers, the combination of salary and little teaching presently offered seem to be satisfactory to compete internationally in attracting high-quality researchers. But in order to keep them, more satisfactorily and more transparent long-term job prospects must also be put on the table. (HS Panel)

A two-stage system is being discussed, starting with a 2-year postdoctoral position followed by a junior fellow position that may become tenure-track. In developing the new model, it is important to make sure that the more senior positions have enhanced prestige and adequate funding. In many other European countries, there are prestigious senior fellowships that provide support for five years, with adequate research costs [...], and the new Swedish model might seek to emulate the best of such schemes. (ST Panel)

The department expressed concerns about the termination of junior research associate (forskarassistent) positions. The department has relied on these to keep a flow of two or three new people each year whose research contributed strongly to their groups, and who might or might not eventually be offered a permanent position. The department fears that the new tenure-track model might discourage such high levels of activity among junior appointees, and perhaps lock some weaker candidates into the system. (ST Panel)

Implementation of a tenure track system at the university is necessary to provide an option for career development for the brightest young scientists. This system is also needed to guarantee high quality performance of the departments in the future. To attract scientists of high caliber in a very competitive global market, the university should put in place a tenure track option right from the start of employment. This issue is highly relevant in attracting young scientists, and is needed against the background of an expected generation shift among senior principal investigators and key clinical collaborators within the next 5–10 years. (MP Panel)

Mobility and visits abroad
As in KoF07, some panels pointed out the negative effects of the low mobility in the Swedish academic system: the lack of competition for the research posi-
tions, combined with the lack of mobility, inevitably result in a risk of moderate quality of research in the long run.

[...]

Inbreeding

Comments regarding the habit to recruit one's own alumni for research positions were not few. Panels from all domains had noted this circumstance, as in KoF07, but some positive trends were also highlighted.

We were surprised at the extent to which the department appears to be dominated by its own alumni. Only one out of 40 teaching staff was previously not linked to the department at an undergraduate or PhD level, and frequently both. We suggest that in the future, open positions be widely announced internationally. Uppsala's strong reputation would be expected to attract outstanding applicants. This would be advantageous especially if the department seeks to provide a more evenly balanced distribution of areas of research and teaching, as we recommend in this report. (HS Panel)

Recruitment policies of PhD students and junior faculty have focused on internal recruitment. This has probably contributed to organizational coherence and effectiveness, but at the cost of diversity and in some conflict with the university-wide principle of internationalization. In the PhD program, for instance, it was estimated that the large majority – perhaps three-quarters – were recruited from the Master's program in the department or from research assistants working in the [...] program. (HS Panel)

Inbreeding is still prevalent in the Swedish university system. Research faculty should be encouraged to move between universities early in their career to enhance their experience. The nature of the system is that there is a high average age of faculty. It is hard to hire young, independently minded faculty who are not supported by existing senior people. That might not be a problem in a field that evolves slowly, but the speed of change in [...] forces faculty to hire people in fields far from that of existing senior faculty. It should be the department's responsibility to nurture people in these new areas, even if they do not play into anyone's current program. (ST Panel)
Similar to the situation in the KoF07-evaluation, the vast majority of the faculty has pursued their scientific careers from undergraduate studies to professorships, except for the postdoctoral periods, at Uppsala University. Undoubtedly, bringing in novel experience would contribute to the scientific milieu and is expected to increase the overall attractiveness of Uppsala University. Although the panel noticed that among the newest recruits, the number of scientists without Uppsala background is substantial, the panel recommends an extra effort to be put to attract faculty also from outside the ‘Uppsala breed’ to renew the university. (MP Panel)

**Gender issues**

Though substantial actions have been taken to try to level out the gender differences within the different employee levels change still seem to be slow. A typical gender profile is brought forward by the first panel below:

The gender profile represents a somewhat extreme version of that noted internationally, with 70% of PhD students being women, 50% of postdoctorals, 56% of researchers, 38% of senior lecturers, 25% of promoted professors and only 17% of chair professors. Two of the professors about to retire are women, which would leave the department with no female professors. There is clearly a need to attempt to redress this balance while maintaining academic standards. (HS Panel)

It has been shown that having role models at all levels in a [...] department hierarchy is very important for the retention of female students. We thus encourage hiring and promoting more women at the higher ranks. This would have a great impact for the future of [...] since it will also enhance the natural retention of female undergraduate and graduate students, as well as those who may decide on an academic career. One graduate student expressed the desire to have a senior female faculty member in each of the divisions and we believe this is a worthwhile goal for the future. (ST Panel)

Many talented female staff are engaged in research and teaching across the Faculty. Gender imbalance, with a bias towards males, was apparent among senior versus junior scientists, and also in major research funding success. While this situation may not necessarily be unique to Uppsala University, career advancement must remain independent of gender and focus on academic performance and achievements. (MP Panel)

**Mentorship**

Several panels addressed the need for mentoring, especially of junior researchers:
A particularly important lack is that of support for junior researchers. If they are part of a strong group, then support from within that group appears to be excellent. However those outside appear to be expected to raise their own research funds, something that is difficult for a young researcher without a track record to do. Internationally, it would be the normal case that young staff members would automatically be assigned research space, some equipment and some scientific and mentoring support. Without this, they will find it hard to flourish. (HS Panel)

It is important that junior academic staffs are given mentoring by senior staff about planning their research portfolios. The rising pressure to obtain small funds for every circumstance can act against the achievement of truly world-leading research results: junior staff may become obsessed with securing small pots of money to buy equipment or fund a PhD, and lose sight of the need to have the courage to lead in their international collaborations. (ST Panel)

At the department, there has been a strategy of encouraging everyone to contribute to the research output. However, the individual staff members must fulfil this supportive opportunity, otherwise the department as a whole fails to upgrade its research performance. To avoid this, the more experienced staff should give advice and support in the publication practices for key international journals. (HS Panel)

Many of the […] projects are in mainstream areas that are fiercely competitive and fast-moving in the international arena, […] This shows an admirable level of engagement in scientific problems of international stature, but comes with some risks: it is important that some help is given to the younger and less experienced researchers involved, to ensure they have a full grasp of the relevant data and its limitations, and of the international competition they face. There is a clear mentoring and supervising role here for the more senior members of the group, whom we urge to examine these issues carefully. (ST Panel)

Research activities and dissemination

In comparison to KoF07 funding peculiarities were less of an issue raised by the panels in KoF11, as were overhead costs. Regarding overhead costs, all universities in Sweden have introduced a common principle for accounting in terms of direct and indirect costs, but this system is still new and has not been evaluated.

Most comments regarded time allotted for research (in comparison to other duties), focus issues, and publication and dissemination issues. The latter was
Part II: Summary of the results

rarely mentioned in KoF07. These issues address research groups and their success rate but also some overarching conditions:

- Research vs. teaching load
- Fragmentation and research focus
- Critical mass
- Qualitative imbalances
- Contacts and networks
- Dissemination and publication

Research vs. teaching load

Among the most common type of comments were notes on the different teaching loads applied across groups, departments and faculties. The separate funding to research and education seems to be a Swedish peculiarity, and most of our own researchers as well as external panellists have viewpoints on this and its effects:

The career path structure appears to impede full exploitation of the research potential of the departments we visited. The panel learned that mid-career staff is expected to spend up to 75% of their time on teaching. This limitation on research time clearly hinders the university’s research quality. It seems a waste not fully to exploit the proven research capabilities of this group of competent staff who are at the prime of their research lives. (HS Panel)

The main focus of the Faculty seems to lie on teaching, with rather heavy obligations on the personnel, and no possibilities for regular sabbaticals. The Faculty has attempted to remedy this by reducing the teaching obligations for “lektors” and professors, but is still hampered by more general Swedish norms and by the fact that the research part of the Faculty’s budget is decreasing in relative terms. Unless the Faculty can obtain external funding of its research activities or convince the university to bring a better balance between allocations for teaching and research, we fear that it can be difficult for the Faculty to maintain the necessary standard of research in the future. (HS Panel)

The heavy teaching load for young faculty without external funding is a well-known and chronic problem retarding the development of the best and the brightest (as well as discouraging potential applicants for lecturer positions). (ST Panel)

Again continuing an issue raised in KoF07, the teaching loads are in some cases unevenly distributed over divisions, with a major factor being the
relative amount of external funding that is in some sense used to “buy out” one division’s staff from more teaching than another. Some attempt should be made to make this more uniform, in direct connection with the issue of support for positions raised above. We reiterate with a quote from KoF07: “As one reference number in this context, the almost canonical teaching load in the sciences in a research-oriented U.S. public university is 3 lecture hours per week, plus some minimal laboratory or seminar supervision.” (ST Panel)

Finally, for some senior persons the teaching load is too heavy to enable them to do good research. This should be considered. It may result in different ways in which areas are taught but also in the way these persons are being paid for their research endeavor. This could also entail that teaching is divided among the staff in a more flexible way, e.g., by asking less teaching from some faculty. (MP Panel)

While in some individual cases teaching burdens may be excessive, in general terms teaching loads seem to compare favourably with those found in other countries. We consider therefore that the issue may concern more strategic leadership with respect to the rational organisation of teaching - and the relative status attached to teaching and research - rather than the volume of teaching in itself. (HS Panel)

At the same time this structural obstacle has been reduced, or even overcome, by some of the departments and centres we visited. Often, the teaching load of mid-career staff has been reduced because the departments have succeeded in attracting external funding which they have then used to give mid-career staff more time to do research. However, this raises the question whether such solutions are in fact optimal. Certainly, achieving external funds is not cost-free: some of the time and effort needed to apply for external funds could be channeled directly to research. Therefore, we recommend that mid-career staff be allocated more time for research. It is our belief that the current staff structure is a hindrance to raising the research quality at Uppsala. (HS Panel)

A considerable proportion of resource allocation to the groups of the department is based on teaching activities that are quite unevenly distributed. Some PIs use half or even more of their time for teaching whereas some do not teach much at all. The department leadership is currently reconsidering distribution of teaching. A strategy where all groups participate in teaching to some extent should be possible in the department. The strategy where resource allocation to the groups depends on teaching activities should be also reconsidered, and more emphasis should be
given to research accomplishments and participation in major thematic research areas. (MP Panel)

**Fragmentation and research focus**

Many comments addressed the fragmentation of research found for many activities at the university. The balance between “freedom of research” and the need for focused efforts is delicate, and it reveals the sometimes opposing relation between efforts to reach top-level research vs. offering a variety of research directions in a limited environment:

Most important is that the areas for research which the group presented to the panel – […] – are too broad to provide an opportunity to achieve leadership positions given the current size of the group. Departments with 40 to 50 faculty members (full professors and senior lectures) […] may strive for global recognition on such a broad research basis; a group comprised of three professors and five senior lecturers is simply too small to achieve such recognition. We recommend that the […] group collectively develop a more focused research strategy. (HS Panel)

In whole the department is diversified, more focused on individual output than team work. […] Second, while the variety in the staff’s research interests is impressive and very attractive to their students, a more focused approach on a smaller number of research themes would result in a richer output and give visibility to a few, very high quality research areas. (HS Panel)

All the directions for future research suggested by the division are by themselves appropriate and interesting, and well aligned with the division’s scientific strengths, needs of society, and/or commercial potential. However, the panel believe that it would be beneficial for the division in terms of quality development, and international visibility and impact, if it could consolidate its resources in somewhat fewer directions overall. (ST Panel)

The committee was a little worried at the sheer range (both intellectual and geographical) and number of collaborative international projects the […] group was involved in. Certainly they are putting their energies where their declared strategy lies. Only they can judge whether this is realistic, whether the senior leadership can keep quality control over such a range simultaneously, and whether they can deliver high-quality research in all those areas. Some conscious prioritization or targeting may become necessary in the future if quality is not to slip, and planning for such a contingency is probably sensible. (ST Panel)
Secondly, synergy is needed to stimulate working on common research questions, theoretical approaches and methods. Thus, the more in depth approach needed for high quality research can be reached. The research groups in the department vary in size (3 to 42). Different investigations suggest that for creative and synergistic research a critical mass from 10 to about 30 members in size in groups is needed. We suggest that there be a re-organization of the existing groups. Common themes should be identified. (MP Panel)

Yet, the department does not have a clear overarching focus to drive its efforts and distinguish it from other groups at Uppsala University and elsewhere. It is therefore particularly difficult to judge its overall quality. As on our previous visit, the panel encountered a lack of conceptual clarity as well as limited strategic vision. One might actually say that in itself the lack of such overall vision is a weak point. Similarly, a number of the groups have no clear vision of their main focus nor of the central research questions they address. Theoretical underpinning of the research is often lacking. The panel met many groups of different quality and of different focus. (MP Panel)

Some examples were also highlighted, where an intentional, or unintentional, strategy from a department contributed to less overall focusing:

The general policy of the department, the “thousand flowers” approach, is also applied to the PhD training and the recruitment principles for new research students. However, this individualism mitigates against strong network formation. If groups and strong networks are not formed during the research-training years, there is less chance that young […] will ever learn to work in strong groups and networks. (HS Panel)

The research management at the Faculty can be described as decentralised in the sense that the choice of research areas and topics and whether the research should be done individually or in groups are left to the researchers. This is the result of a deliberate strategy based on a firm belief in the advantages of a bottom-up approach to research. Apart from ensuring that there are qualified teachers in every subject taught in the […] curriculum the Faculty’s more targeted directing of research activities has been limited. […] Like the panel of KoF07 we nevertheless think that the Faculty could benefit from an explicit discussion about its general research policies, stating the priorities and development areas in future research. The bottom-up approach seems to have led to a lack of a necessary overview over the activities going on. A more comprehensive approach to the research activities could facilitate a more active role for the Faculty in bringing researchers together and giving necessary stimulants and
incentives independent of the need being recognized by the individual researchers. (HS Panel)

The panel noted that junior academic staff within the Faculty was encouraged to develop independent research programs, even though their participation in collaborative research would foster the development of critical mass within a thematic research area. The panel considers that this apparently strict requirement for junior staff to develop their own independent programs may limit their ability to interact or share with colleagues, or mutually mentor students. This also leads to fragmentation into smaller research groups under junior scientists, and a lack of critical mass in any one area of research. (MP Panel)

It was pointed out by at least one panel that too sharp a focus could also pose a potential problem:

While we were in general impressed by the research within the department, two things concerned us. The first of these was the degree of concentration of resources onto a few areas [...] A strong research department must of course specialize on a subsample of these areas, but relying on one or two areas [for the whole department] is dangerous. Even the most exciting topics run into fallow periods when they become relatively unproductive, while funding agencies are always in danger of a change in governmental priorities. A broad based department is likely to be much more able to withstand such lean years. (HS Panel)

Finally some positive examples were highlighted:

Its focus on two restricted areas of research makes for high quality work that can have international significance. Much of the research is published in peer-reviewed English language international journals, among the most prestigious in this field of research. The journal articles reviewed by the panel were throughout of a good standard, as would be expected given the journals in which they were placed. The unit thus targets its efforts effectively and to best advantage. (HS Panel)

The Department [...] is organized into five thematic programs. The faculty within the programs has overlapping research interests; thus the clusters of individual research groups form cohesive research and training programs. Moreover, there is ample opportunity for synergism and collaboration among the groups in such areas as [...]. The department overall is very strong, with a notable number of research groups that are of the highest quality - headed by international leaders in their respective fields of research. (ST Panel)
The process of incorporating the previously independent departments [...] has created a situation of extreme diversity in this department. This diversity can be seen as a potential strength to create multidisciplinary constellations extending from very basic [...] studies to clinical research. The panel recognizes that this potential has in some units been realized since the KoF07-evaluation. As a consequence, the department has identified four major thematic areas where this multidisciplinary potential is exploited: [...]. These thematic areas form the basis for strategic development in the Department of [...] and have created a research profile that highlights its wide scope. [...] From an international perspective, the thematic areas of the department cover major research initiatives that have led to publications in top-tier general and [...] science-oriented journals. (MP Panel)

**Critical mass**

A common note in the reports has been that research units (groups or in some cases even departments) are too small and that they thus fall short of a critical mass, though to a lesser extent than in KoF07. This is true for panels in all three disciplinary domains of the university. They mention several examples of groups that are too small or individuals who are mainly working by themselves:

However, with its current size, the department is vulnerable to all sorts of uncertainty. We recommend that the Department of [...] make an effort to increase the present level of external funding in order to create more research opportunities. Such funding would also make it possible to form a larger group of teachers, which in turn would alleviate the problem of heavy teaching load of members of department. (HS Panel)

There is nevertheless a serious problem as the two senior personnel have considerable teaching loads, largely because they are both promoted professors, and there is minimal staff below them who could both lighten this load and provide important support for PhD students. The panel considers that a solution to this problem needs to be sought urgently. (ST Panel)

The panel suggests that synergy in the department needs to be nourished for two reasons. First, the groups are currently small and therefore vulnerable. They sometimes depend on one person only. Such lines of research may have to be terminated when that one person would no longer work in the area. Thus, no continuity can be built. Their consistence seems historically rather than content driven. (MP Panel)

As already mentioned, the overall research environment is not optimal due to the dearth of academic staff and the need to cover an immense
subject area with such limited resources not only in research, but also in teaching, planning and networking. (HS Panel)

**Qualitative imbalances**

A more delicate issue regards the qualitative imbalances found in most departments and how these could affect the overall standing.

Stronger groups in particular have excellent networks of international and national contacts and collaborations. This is less so for the weaker groups, something that tends to lead to the strong becoming stronger and the weak weaker. This in turn leads to a very unbalanced department. (HS Panel)

The department has been very successful in getting external funding for research projects especially in […]. However, the research projects tend to be connected to individual researchers and their external networks rather than being conducive to larger collaborative projects within the department. (HS Panel)

Since KoF07 significant positive developments have taken place. The research now gives more priority to the previously stronger research themes [...] and less priority to a previously weaker theme [...]. (ST Panel)

**Contacts and networks**

In the same spirit comments are made on the outreach from different research groups, which truly vary in quantity and quality:

Substantial research is carried out in a number of important areas. However, not everything is rosy. The general impression of the research is one of fragmentation and an uneven and scattered pattern of interest areas. Some important areas of […] seem to have vanished from the department’s horizon […]. At the same time, staff members seem to collaborate little in areas where research is done. (HS Panel)

The physical environment of the department is excellent, both in quantity of space and for the most part, in quality of equipment. The intellectual environment however is not so good. In particular, links between groups appear to be weak, even when they would appear to work in related areas, as in the several groups concerned with the study of […]. There does not appear to be a system of internal talks whereby various groups could learn about each other’s activities. (HS Panel)
Many of the groups still view themselves as independent programs, with little overlap and contact between groups. This was a common perception across all […] departments and seems to be a historical artifact from the time when research groups were each a self-contained department. The committee felt there were many areas of common interest among groups, in such areas as […]. There appear to be artificial barriers to crossing program lines that inhibits the considerable synergy that could be gained by interactions among the programs. This led us to the concern that students and postdoc are not learning as much as they could from each other, since they seem to stay within their own groups. As modern […], they need cross-disciplinary training in order to compete internationally. (ST Panel)

Despite this favorable development that has certainly improved quality and renewed the department’s research on the selected thematic areas, some research areas still exist that have not found any connection to other, likely synergistic, areas of the department. (MP Panel)

The research presented in this area is strong, with a good publication record and productivity, including intellectual property and spin-out companies. However, the science appeared to be making incremental contributions to a well-developed field […]. If the group were to work more closely with other laboratories among the academic staff focused in thematic areas, the opportunity to share resources and benefit from the expertise of other academic staff would be enhanced. (MP Panel)

**Dissemination and publication**

Many panels, mostly HS Panels, commented upon the situation regarding dissemination of research results such as publication. Roughly the same number of negative and positive examples was brought up. Most panels also made concrete suggestion on how to improve the dissemination and footprint of Uppsala University. Rooms for improvement were pointed out:

While the numerous (funded) research projects have resulted in many conference proceedings, the panel was disappointed by the inability to bring these preliminary research publications to a higher level required for publication in top journals. While there was some limited success in doing this, given the size of the group and the high level of research support, clearly many more conference papers should have been improved for submission and publication in top-tier journals. (HS Panel)

We have, however, noted the lack of overall strategies for internationalisation and publication. There should be a more explicit policy which encourages doctoral students to study abroad and establish international
contacts. It is also our impression that the question of where to publish and how to reach out in international publication channels is left to the individual researchers. We believe that all could benefit from support from the Faculty in such matters. (HS Panel)

But also some positive examples:

We would also like to commend this group for publishing very influential books as well as the refereed journal articles that are the focus (sometimes too exclusively) of most [...] schools, [...]. Books are much more likely than refereed journal articles to reach across disciplinary boundaries and to exert an influence on a multiple communities of researchers, and the reputation of the group has been greatly enhanced by its production of influential books, and we recommend the continuance of this practice. (HS Panel)

All research groups that were presented to the panel encourage internationally embedded research and do publish internationally. They actively work to publish in the better journals/publishers although resources, notably time constraints, sometimes also make publications in less prestigious journals acceptable. (HS Panel)

Many publications within the unit still are “intra-Swedish”, i.e., written in Swedish for Swedish venues, and thus less likely to attract the attention of the international [...] studies community. However, the unit has followed the 2007 recommendation that the Faculty of [...] make its research more visible internationally by turning its in-house journal [...] into a peer-reviewed online journal with external reviewers and a much broader international readership than before. The journal is now inviting a guest contributor from outside Sweden for each issue, is putting out an international call for submissions, and is announcing each new issue on international [...] studies e-lists. (HS Panel)

Some other points, or suggestions, put forward regarding publication principles were:

The group should also establish annual and five-year objectives for the number of articles published in top tier journals. (HS Panel)

Expectations of young scholars in terms of success criteria concerning research and publication, the obtaining of external funding, teaching and relations to students, as well as interactions with society in general could be spelled out in clearer terms. There is, for example, a current debate about publishing monographs versus publishing articles, and about quan-
tity and quality when it comes to publication in general. The department should aim for the highest possible quality in every area of publication. (HS Panel)

Although it is important to publish in the languages and literatures under study, and essential that Swedish scholars be able to discuss and describe their research in their mother tongue, we wish to stress the importance of publishing in internationally recognized journals and series, and in the case of monographs, with leading presses, and producing adequate summaries in English when that is not the language of publication. This will strengthen the dissemination and evaluation of research at Uppsala University. (HS Panel)

In this connection a general problem should be mentioned: In Sweden there is no general practice among publishing houses to have the manuscripts they receive from scholars peer reviewed. Since many scholars within the humanities write books that are published by commercial or semi-commercial publishing houses and reach a larger public, this causes an evaluation problem that is growing concurrently with the demand within the university culture that humanistic research publications must be peer reviewed. Procedures should be established to support the double goal of peer reviewing and large public outreach. (HS Panel)

Even amid the push to publish in English many studies concerning Sweden deserve to be published in Swedish in order to effectively disseminate the results and have an influence on public debates. (HS Panel)

Panellists were quite impressed by the quality of some of the books published by Uppsala University. However, since many of these publications are not widely marketed or distributed outside Sweden their international impact is likely to be considerably diluted. The panel feels the lack of a competitive university press with an international profile at Uppsala represents a lost opportunity both to showcase the work of scholars at Uppsala and to forge connections with scholars in other countries (a true university press would, of course, publish work by foreign scholars as well). It is a challenge to ensure broader international presence for key Uppsala publications, and we therefore recommend that this issue be addressed. (HS Panel)

In view of the excellent experimental facilities in the […] lab and the appealing research program we encourage the researchers in the […] Department to take more opportunities to publish in high impact scientific journals. This would increase visibility and improve ranking. (ST Panel)
Overall planning and infrastructures

A third cluster of comments and suggestions can be said to comprise higher-level issues such as strategies, overall planning, and (larger) infrastructures.

Many comments regarded the need for overall strategies and how to maintain expensive equipment and infrastructure also within the premises of the university. These are issues relating mostly to Faculty and University level but with direct impact on individual groups and researchers. Most comments can be related to any of these three headings:

- Strategies
- Infrastructure
- Databases and simulation techniques

Strategies

Negatively flavoured comments were e.g.:

There are likely to be a number of retirements in the near future, coupled, we understand, with major national changes in the university funding system that will allow universities much more freedom to plan for future developments. It is essential that the department take this opportunity. Unfortunately however, there is little evidence of a broad strategic plan.

(HS Panel)

The apparent lack of a strategy may not affect the quality of the research at the Faculty directly, but for instance, the fact that there is little or no substantial research within fields such as […] does not seem to be the result of a conscious decision. A strategy could also help making the gender perspective more visible. It could also help the Faculty to decide on what resources would be needed to develop […]. Apart from aiming at fulfilling the teaching obligations, there seems to be no long term plan on how to recruit new researchers. The long term planning is especially important when senior scholars are up for retirement, where there is a need for a clear vision on how to maintain and further develop the competence and networks that have been established. […] (HS Panel)

The research projects in […] selected to be presented were led either by the professor in charge, or surgeons not officially in charge of the research at the clinic. It turned out that research conducted by the professors seemed quite vulnerable in the way that many of them had continued too long with the same research areas, which they had been familiar with for a very long time. Such research is in danger of losing interest and power, if not young research colleagues are taken onboard. The time of retirement
had apparently not been anticipated and handled adequately in many of the [...] research fields. (MP Panel)

But on the other hand several positive examples and instances of good practice were put forward:

The KoF11 panel saw several cases where small amounts of resources have yielded significant publication results. One mechanism that has encouraged this has been the flexibility allowed by faculty to concentrate their teaching duties into relatively short duration blocks of time (e.g., over three to four months) thereby permitting extensive blocks of time for intensive research efforts. These blocks of time can be used for research at Uppsala or they may enable the specific researcher to travel to other universities for collaborative efforts with other [...] researchers. (HS Panel)

The presentations did not make unrealistic claims, but instead showed a balanced awareness of what was achievable and relevant, and what would make their participation effective. As far as interaction with industry was concerned, they showed a clear awareness of the difference between a routine consulting role and a much more rewarding intellectual role in driving forward the methodologies, techniques or imaging capabilities that make a substantial difference to what industry can achieve. (ST Panel)

The vision, aims and strategies of the department are clearly formulated and if followed, the department will be in an excellent position to increase its already very high standard. (MP Panel)

Other observations and suggestions were:

Assistance with “technology transfer” (acquiring worldwide patents, further commercialization, etc) would further enhance the societal usefulness and benefits of this program. (ST Panel)

If any recommendation were to be given to the group, it would be to encourage the group to be somewhat more adventurous in its choice of research topics so as to take a chance of moving ‘ahead of the crowd’. (ST Panel)

In parallel with the assessment and consideration of the three options described above, there is an immediate need for strategic planning across the Faculty. Due to the retirement of a large number of full professors within the next few years, the opportunity for renewal is exceptional. […]
New professors should not be appointed until future appointments are considered within a whole-of-Faculty context and assessed against the strategic intent and research and education needs of the overall Faculty. (MP Panel)

For such enterprise to be effective, the leadership model may involve developing management skills for leading executives and organizing responsibility in such manner that change can be assured. It is suggested that an external advisor can accompany this process over the next years. (MP Panel)

The panel interviewed groups with outstanding success in raising EU money. Grants from, e.g., the EU or NIH, however, cause internal administrative problems with overhead and matching financial contributions from the university. […] Particularly in departments like […] having several groups extremely successful in attracting grants, these issues create a risk to impair the development of the department as a whole. Strategies for grant management thus need to be rethought at the university/Faculty level. (MP Panel)

Infrastructure

This is also an issue that is highlighted in, especially, many of the ST and MP Panels. Several of them discuss core facilities that should be common to the whole Faculty or the University.

A number of panels comment on the possibilities of applying for external funding for expensive equipment etc., on the national level. These possibilities are likely to decline in the future, e.g. as Sweden must redirect significant research funds to support major new multi-billion infrastructures to be built in Sweden (such as ESS; the European Spallation Source, and MAX IV; a new national accelerator laboratory for synchrotron radiation). One panel points out that care should be exercised that these huge projects do not adversely affect the other high-quality research in the country, although the new investments could bring high-profile activities to Swedish science and to Uppsala University.

The panel believes that it will be of utmost importance that the Faculty […] finds novel routes to support and renew the instrument park […]. This is said in light of the fact that the possibilities for applying for funding of larger infrastructure have apparently been reduced in Sweden. It is, however, vital that this problem is solved without making the program a mere service function unit for possibly paying users or clients. It is important to find a balance between research and service functions. (ST Panel)
The MSL [Microstructure Laboratory] in the Ångström lab is a unique and excellent processing and analytic clean room laboratory. Several of the divisions […] use it intensively. In order to stay up to date and competitive, a continuous renewal of capital equipment is necessary. In particular the analytical equipment (e.g. electron microscopes) is mostly over 10 years old. Since external funding for equipment renewal appears more difficult to obtain in future in Sweden, Uppsala University should safeguard sufficient funds to ensure the laboratory to remain competitive. Conversion of parts of the MSL from semiconductor processing to life-sciences oriented research has been started and this is supported by the panel. (ST Panel)

Several panels point out that enhanced cooperation within the university is probably a wise step to consider for the future.

We note however that although the group relies crucially on neuroimaging facilities (PET and MRI), they are dependent on the use of machines owned by the hospital. This means that work has all to be done out of normal working hours, when the equipment is not used for patients, and is furthermore, dependent on the excellent relations between this group and the hospital, where the person providing this essential link is shortly to retire. This means that the university can no longer guarantee facilities for this highly important group, or for any further developments in this area of very considerable current worldwide interest. We find it somewhat surprising that a university of this quality does not have its own neuroimaging facility. We strongly recommend that a university neuroimaging centre be set up, to be used by […] and other interested departments. (HS Panel)

There will be a serious issue in the future concerning the replacement and purchase of state-of-the art equipment, some of which is expensive. The university and Faculty should develop schemes to judge and prioritise requests for equipment, and identify external and internal funding sources. (ST Panel)

The group uses supercomputer facilities whenever necessary and appears to have adequate computing facilities. Additional facilities may become necessary when the new methods become available and applications become more important. Quite generally, Sweden’s central supercomputer facilities currently lag behind local clusters installed in many European and American universities. (ST Panel)

The panel identified the opportunity for both university-wide and Faculty-wide research and infrastructure platforms to facilitate collaborative
research. This optimizes resource utilization and economy. […] In a Faculty-wide context, comprehensive research platforms could include newly organized core facilities that would consolidate existing instrumentation and expertise as core campus resources. Coordination and integration of core facilities across Uppsala University would produce attractive financial benefits, as well as improved efficiency in resource visibility, utilization, and management. The panel recognized immediate opportunities in the following specific core capability/platform areas […] (MP Panel)

Expensive equipment that is used with low intensity (electron microscope, etc.) would be best placed and maintained in a core facility. (MP Panel)

The core facilities should be strengthened further, particularly in terms of space and continuous renewal of hardware components. The latter is critical to keep the units competitive. The core facilities, for example […], could be merged in order to improve accessibility, visibility and exchange. (MP Panel)

We heard repeated concerns about staffing issues for common facilities. Facilities in some cases have been constructed with no provision for maintenance and staffing. This is a very common problem worldwide. It is becoming the usual practice in the universities that the panel represents, to include such funds for running the facility when the facility is planned and initially funded. (ST Panel)

… but on the other hand:

Many staff feel technical support is poor, but most understand that this is an issue for consideration within the department, and that specialist technical support should generally be supported from external grant funding. (ST Panel)

Databases and simulation techniques

One area that was mentioned only briefly in KoF07 is now put forward as a renewal possibility by panels in all disciplinary domains: to take advantage of, and cooperate on, the large number of extensive datasets built up under decades on both national and University levels. These databases have in many cases been vehicles to initiate new research areas and to generate knowledge in methods and simulation techniques that could be further developed. Some examples are:

Its data base […] is unique. […] it is widely used by researchers in academic institutions and international organizations, and generally consid-
erred to be of top quality. [...] It is now truly filling the role of flagship. Updating and expansion has made it more comprehensive and richer in nuance. There is no comparable data set internationally in this area. (HS Panel)

Another source of significant competitive advantage is the excellent and internationally unique resource which it has developed in the [...] dataset. Some 10 years ago the institute started establishing this longitudinal data base consisting of all individuals who have resided in Sweden in any of the years between 1990 and 2008. The data base has information on, for example [...]. A substantial part of the research that the [...] engage in with respect to neighbourhoods and neighbourhood effects utilises this data base. This has produced results in the form of two completed dissertations and some more to follow and more than 10 articles in high ranking journals. (HS Panel)

The rich register datasets available at [...] provide very good possibilities for doing this type of empirical work. This research is very important, in particular in these days when much of the macroeconomics around the world, and affecting the thinking of policymakers, is rooted in macroeconomic models that are based on overly simplified representations of microeconomic behaviour. [...] In discussions with members of the department it turned out that analyzing climate change using time series techniques is emerging as a possible research topic there. There is no doubt potential for interesting and useful statistical contributions to that area. The large variety and availability of time series data on various climate indicators should create ample opportunity to do serious applied work jointly with local experts on climate and climatology. (HS Panel)

The position within a strong faculty [...] provides opportunities for cross-disciplinary research through a more conscious strategy at the faculty level to reduce the mental barriers between departments, although this potential has not been utilized as much as could have been the case. [...] A more sophisticated utilization of the internationally unique [...] database is an opportunity for internationally highly visible research with also strong potential for societal relevance. For this, also more sophisticated approaches are needed. (HS Panel)

A long tradition of [...] research has led to significant databases that can be used by researchers. Building on these existing databases is a very cost effective means of generating research papers and reports that can be of significant interest to the broader research community. The panel encourages [...] to continue these types of activities. (HS Panel)
We were also struck by another very promising area of research being initiated in the department in collaboration with colleagues in […], where they are using the extensive “twin registry” to investigate the role of genes in influencing political behavior and attitudes. No one on our committee or for that matter in the […] community generally, can know where this research will lead and/or whether the interesting findings generated so far will in fact “turn out”. Certainly, this is a very controversial topic for research in Sweden, as elsewhere. But, this is by any measure pioneering research. We also believe that this area of research might be fruitfully further combined with work in experimental methods, another promising relatively recent development. (HS Panel)

The […] represents a huge opportunity for Swedish […]. When the time is right, the committee hopes that, following the example of the USA […], all the data will eventually go on the web with open access. This would ensure (a) that everyone would use it, (b) that quality-control would be assured, as users would notify the operators about faulty calibrations and performance, (c) its probable continuity as an essential international resource, and (d) an enormous amount of goodwill and intellectual support from the international community. […] Here is a real chance for Sweden to break the European tradition of jealously guarding and restricting data, and of showing the true potential of open international cooperation. The goodwill alone triggered by this action would ensure that Swedish […] would always be in demand as international collaborators. (ST Panel)

Finally, competence in modelling and simulation was touched upon by several panels, e.g.:

There are areas the panel would particularly encourage more internal collaboration, for example, we feel it would be very beneficial if the various modeling and simulation groups presently scattered between different programs create a virtual center of modeling and simulation, as recommended in KoF07. (ST Panel)

Expanded and integrated “modeling and simulations” capabilities across the three current departments could include coordinated efforts in […]. Indeed, a deliberate plan for more interactions would leverage these strong capabilities and position the Faculty and the researchers to further define this field. Even greater success could result as changes in society demand collaborative science, mandating even closer synergy and cooperation with these groups and other research constellations at Uppsala University. (MP Panel)
Conclusions on general observations

In reading the panel reports, a great deal of valuable information has been disseminated in the University. This is true for individual scholars, research group leaders, department heads, deans and the university leadership. As pointed out before, a considerable part of this information concerns the lower levels of the University.

However there are also a number of comments that have to be taken seriously also at higher levels, even by policy-makers on the national level. It is evident that the panellists have found peculiarities in the Swedish system both regarding recruiting and regarding working conditions.

Inside the university, they plead for a more long-term perspective with a stronger focus on strategic choices regarding future research directions.

Some basic ingredients for achieving a top-level and world-class research group are obvious also from the comments regarding such groups in the KoF11 report:

- Ensure a mixture of local and international staff, including PhDs
- Encourage mobility, with ingoing and outgoing research visits
- Focus research efforts on a few actively selected research areas
- Collaborate extensively on the international arena (but do not forget local collaboration)
- Disseminate research results in prestigious publications and channels
- Be aggressive, but selective, in pursuing external funding
- Do not lock up all available basic funding in long-term tenure-track positions

To succeed fully in all of these would be very difficult, but all groups should consider to what extent they are, or could be, pursuing success in these terms. In general there also seem to be an interconnection and positive feedback between the terms, such that success in a few will also facilitate success in the others.

The goal to reach for, in e.g. KoF11 rating terms, should be based on active and joint decisions. To strive for research excellence in any of these terms can also be opposed by external factors outside the control of the group, such as diminishing research funding or extended teaching loads. A broader but mainstream level would also be desirable if the primary objective is to have a broad offering of undergraduate courses or an open environment towards graduate students.

Effects from KoF07 and post-KoF07 developments

Besides specific notes in the previous sections, some comments should be made on how the results from KoF07 were handled within the university.
National level

We can establish that several of the issues brought up in KoF07 have changed since then.

On a national level, e.g. the “Freedom Act” where universities are given more freedom to decide on various matters including recruiting, a new nation-wide accounting system for universities, reallocation of research funds between universities due to “quality factors”, and an initiative from the Government to encourage extended cooperation between universities through the new Strategic Research Areas.

It is difficult to say to what extent KoF07 had any part in initiating or fine-tuning these new ventures. However, the fact that a self-initiated university-wide research evaluation in Sweden, designed and controlled by an individual university, was initiated with KoF07 has inspired numerous other universities to follow suit. KoF07, and the other evaluations, have all pointed to some common peculiarities in the Swedish research system. These conditions, brought forward by several independent evaluations with international peers, should have constituted a solid base for the Government in identifying areas with potential for improvement on the national level – and future evaluations will provide objective, regular and international feedback on how adoptions to these issues are received by the research community.

University level

Uppsala University had reserved almost MSEK 70/year to be used in responding to the conclusions and recommendations from KoF07. Since the University Board, or the University Management, hardly could determine priorities themselves among the large amount of proposals that were put on the table, proposed measures were discussed in a series of seminars involving University, faculty and department management.

The faculties were asked to present lists of priority actions, justifications for them, and to what extent they resonated with the findings of KoF07. The different proposals were weighed against each other, also taking into account interdisciplinary aspects, and additional funds were subsequently allocated to the faculties to respond to the best proposed actions.

By necessity, all activities that received top-level judgements could not be supported in relation to this first evaluation – that would have dispersed the resources at hand too thinly. This caused some understandable friction from some research groups who thought it unfair that they did not receive additional support, and these feelings still are present to some extent, e.g.:

The panel was surprised and dismayed that, given its KoF07 evaluation and high ranking, […] was not given a larger share of the resources subsequently distributed. (ST Panel)
Some University-wide actions were also carried out, such as joint advertising for new staff in selected areas (see Figure 1). The evaluation and its result were also presented to a number of other universities, in Sweden and internationally, and to governmental and political bodies both nationally and internationally.

**Faculty and Department level**

The panel reports, and on an even more detailed level also the self-evaluations provided by the departments, are probably somewhat influenced by the previous evaluation KoF07. Influence is seen mainly on the department and research-group level, sometimes as a direct effect and in other instances as a secondary effect.

Besides perceived “withheld” additional resources to activities given an excellent rating, as mentioned above, some groups also felt that they were characterized in an unfair and unjust way in the panel report. One example of this was commented upon by one of the KoF11 panels:

> The department was disappointed with the previous evaluation, and found it neither constructive nor helpful. However, after the KoF07 report the department engaged in a good deal of self-scrutiny, and worked hard to overcome the reputation for being overly self-congratulatory which, rightly or wrongly, some department members felt had contributed to the negative assessment. Due to the evaluation the department received no additional resources from the university; however, to its great credit it has aggressively pursued external funding. The panel is very impressed by the department’s success in mounting no less than thirty-three funded projects in the last five years. (HS Panel)

Some other and concrete positive effects after the KoF evaluation are rendered here:

Reacting to the KoF07 panel evaluation, the department has introduced several changes, mainly related to the recruitment of junior researchers and to a more institutionalized organization of research. There has been a clear effort to make the department more international and more integrated with leading research groups and scholars abroad. Since 2008, the department has started recruiting at the international level, participating in the main job markets […] both in the U.S. and Europe. […] This extra money has made it possible to invite a substantial number of long term visiting scholars (with a stay longer than three months), whose number has increased six fold since 2003–2007. This has also enabled the department to increase the number of stays abroad for the faculty and students. (HS Panel)
Figure 1. A job advertisement presenting some 90 positions all over Uppsala University, as a result of KoF07 and advertised in major newspapers.
Part II: Summary of the results

A significant impact of the KoF07 is the increased attention to strengthening the internationalization of the research practices at the department. The recent recruitments have improved the international research profile as well as the progress of the then PhD students into current postdoc positions. […] KoF07 seems to have played a role in ‘shaking’ the department. However, a satisfactory solution has not been developed to solve the ‘chasm’ between the most productive staff members and the ‘others’ […] There is a concern with ‘quality of life’ and inclusion in the department that prevails over the perception of international competitiveness. While the breaking up of sub-disciplinary borders is a welcomed action, the current division is not entirely clear and convincing […] On the whole, however, the panel finds that the department has taken a step forward in the direction of improving the general quality of research and by exploring new routes to renewal along with the ambitions of KoF07. (HS Panel)

After the KoF07 assessment reports were issued, the department made some efforts that have resulted in clear improvements in some areas. A thorough mapping of research and an attempt to categorize thematic research areas are examples of that. (HS Panel)

No units have deteriorated, and the units which were weak last time have improved remarkably. The Faculty management has obviously used the KoF07 in a very fruitful manner. The decisions taken to meet the demands in the KoF07 report have been successful and have thereby contributed to lifting the faculty’s overall quality to a higher level. (HS Panel)

It was well rated in the 2007 KoF report, with islands of world-leading research, and there have been considerable improvements since then. Several research programmes within the department are assessed as top quality, leading the international agenda, and most are of high international standard. Existing staff, and newly appointed staff have achieved considerable success in developing large-scale research programmes, many with multiple external partners. Overall, the department has considerably improved its external research funding, and it is in a good position to consider hiring some additional staff. (ST Panel)

According to the perception of the […] Department itself the KoF07 had a “disappointingly small impact” in spite of the generally high ranking of its quality in the KoF07 report. This is likely to be a narrowed view on the additional funding received from Uppsala University based on KoF07 which apparently was indeed small. In terms of topical renewal and organizational chances the panel has the impression that KoF07 had quite
a noticeable impact, e.g., concerning the increased cooperation between the divisions, the establishment of “centers” or the discontinuation of sub-critical research activities. (ST Panel)

As we remarked earlier in this report we were very impressed with the great improvements in the research output & in the faculty organization in only four years. There had also been a sea change in the near total embrace of the new biology of genetics & molecular medicine. (MP Panel)

In general, the panel has given higher scores than were given in the KoF07-evaluation and identified several research units/programmes where research is of top-quality or of internationally high standard. The panel recognizes that the research staff of the Department is quite international […] Since the last KoF evaluation there has been significant and consistent development […]. The number of publications has increased significantly and their level has even increased further. The research is even more focused […]. The study team has been successful of recruiting and retaining talented and skillful postdocs. The research group has also been successful in obtaining a significant amount of external funding reflecting the credibility of its work. (MP Panel)

Since the KoF07 major changes have taken place at the organizational level. […] Moreover, based on the KoF07-report the department has obtained more money to be able to recruit young scientists and improve core facilities. Also biobanking activities have increased. By contrast, collaborations with e.g., […] and associated clinics are still limited. (MP Panel)

**Humanities and Social Sciences**

The Disciplinary Domain of Humanities and Social Sciences at Uppsala University consists of six faculties: Theology, Law, Arts, Languages, Social Sciences, and Educational Sciences.

This area was evaluated by panels 1–11, comprising roughly 50% of the total number of panel members. This number of panellists reflects the wide variety of research issues carried out in the Humanities and Social Sciences, but also the comparatively large number of small departments compared to Science and Technology, and Medicine and Pharmacy.

We refrain from making summaries of the findings for individual departments (as was done in KoF07) and panels and summarize some comments that were biased towards the Humanities and Social Sciences.

Besides the comments from HS Panels already iterated above, one important
and overarching question relating to the special circumstances for the Humanities (and to some extent also the Social Sciences) was brought forward by two of the panels:

[...] the members are not convinced that the setup of the evaluation allows us to formulate a well-founded judgment on the substantial quality of research, at least not within the humanities. [...] It should be noted that several of the departments visited by the panel carry out research which is closely linked to a regional heritage, or to materials written in Swedish or found uniquely in Sweden. [...] All of these regionally or nationally rooted research activities tend to be acknowledged internationally for their demonstration of a unique understanding of issues in their local context, and they deserve not only to be protected and nurtured, but also recognized as work which sets a standard for the international community to follow. The special conditions of such research are not made allowance for by a simple rating in narrowly defined categories of quality.

It is difficult to measure research in the humanities along the same lines and norms as are customary in the sciences, but the panel has even so followed the instructions given by the evaluation project. Two remarks have to be made. First, we emphasise the importance of national and international publications. Swedish research in the humanities ought to be published both in Swedish and in foreign languages. Second, we appreciate monographs, edited collections and articles in scholarly journals; all these publication channels are valuable and relevant for scholars in the fields we assessed.

The panels found that the research level and the level of productivity of the departments of these six faculties are generally quite impressive. They formed a generally favourable impression of the departments visited, with great diversity and a unique range of research pursued. The panels also point out that much good research is carried out in the units surveyed. “Because of the energy, enthusiasm and dedication of individual researchers and groups, impressive results are reached in spite of sometimes inadequate funding” is one typical comment. Also pointed out is the need to continually rethink the structure of research and teaching in the Humanities, taking into account the relative size and vulnerability of some subject areas. One recurrent impression is that the domain as a whole is undergoing a positive trend with vitalisation and renewal of many research activities. This is partly related to the expansion related to the increase in the number of students admitted.

In KoF07 many of the activities were described as being somewhere between Internationally high standard and Internationally recognized standard. In KoF11, with roughly the same number of activities rated as in KoF07, the panels have chosen to be more precise in their rating, and substantially more
milieus have been rated as of Internationally high standard. The number of top-quality activities is also higher, with the same increase as for the other domains in relative terms. A direct comparison is not possible since many groups have been reorganized or altered, and the total evaluation sample is different due to the “pre-selection” of activities by the departments in their (limited-scope) self-evaluations.

Science and Technology

The research of the Faculty (and Disciplinary Domain) of Science and Technology was reviewed in seven different panels, with almost 30% of the total number of panellists. The task of panels 12–18 reflected the faculty’s informal organization into sections covering the traditional areas of natural sciences: Mathematics, Physics, Chemistry, Biology, Geosciences, and Computer Science. The Faculty also includes Engineering Sciences as one of its sections.

The last century has seen more and more bridging of these traditional areas into interdisciplinary activities making use of tools and methods from different areas, recently also outside Science and Technology, and including other disciplines such as medicine, pharmacy and social sciences. In this lies great potential for the future but also risks in terms of diluting core competences, fragmentation, and short-term strategies owing to governmental and societal focus areas’ varying over time.

Based on the KoF11 panel comments, Science and Technology is in a good position to respond to various calls as well as to continue with its present successful activities, or as one panel puts it:

As Uppsala University is a comprehensive university with many faculties, there are many opportunities for cooperation in different areas. Thus there should be possibilities to build up larger and long lasting interdisciplinary projects which could get substantially more money from external sources than what we see today.

The panels are generally impressed with the overall quality of the programs and their impact despite the fact that some were established only recently or are in a state of flux. Several departments were unanimously ranked as excellent by any standard, with a lowest rating of International high standard, and a number of activities assessed as world leading.

The Faculty also houses basic research around some of the “tools”, e.g. in Mathematics and Computer Sciences, needed for development of almost any research activity regardless of discipline. This is commented upon as “Computer Science remains one of the highest-priority research areas for society and the economy. It is a rapidly changing field providing opportunities for making significant impacts”. As noted previously, many panels in all domains saw oppor-
tunities in making use of existing datasets, databases and modelling techniques which could be further improved with extended collaboration with mathematicians and researchers in computer sciences.

Comments regarding research environment and infrastructure were often quite positive, although one finds examples of potential for improvements and a fear of diminishing external resources to maintain or improve existing infrastructure.

In KoF07 many of the activities were described as being somewhere between *Top-quality* and of *Internationally high standard*. In KoF11, with almost the same number of activities rated, the panels have chosen to be more precise in their ratings, and quite a few more activities have been rated both as of *Top-quality* standard and of *Internationally high standard*. The relative increase of *Top-quality* activities is the same as for the other domains. However, it is not always the same activities that have been scrutinized, so any direct comparison on the unit level will not be relevant.

**Medicine and Pharmacy**

The research in this Disciplinary Domain with its two faculties (Medicine and Pharmacy) was reviewed by seven different panels, 19–24. These panels included roughly 25% of the number of panellists. In comparison to KoF07, with six panels, Clinical Research was divided into two separate panels (22A and 22B) covering different parts of the vast area of Clinical Sciences. We succeeded in recruiting members from the joint clinical KoF07 panel to both these new panels to ensure a level of panel continuity.

There are specific conditions for Medicine and Pharmacy, with its connection to and heavy dependence on the University Hospital. The Hospital is an ambiguous entity. On the one hand, it is an operational asset under the governance of the county (with political implications) and demands from the public to provide swift and top-class health care. On the other hand, the Hospital should be a milieu for advanced research activities with close connection to Uppsala University. A number of conditions are affected by this dual-identity. Examples are publication policies affecting bibliometrics (should the author have the University or the Hospital as primary affiliation?), personnel data (some researchers are employed by the University but work mainly for the Hospital, and vice versa), research funding (dual channels for funding, both from the University and from the County Council, e.g. “ALF money”), and funding of expensive equipment that will be used both for clinical purposes by the Hospital and for University research.

These facts have made it difficult for the panels, in some cases, to fully understand the conditions, the causes for perceived problems and realistic measures to handle them.
Generally, research activities were graded according to the recommended quality rating, although there are exemptions where panels have applied their own quality scales. The panels identify a large number of research activities of very high or world-leading quality. Several panels were very surprised at the progress made in the relatively short period of four years, partly from taking up of some of the KoF07 advice, and mainly by the establishment of the Science for Life Lab and similar overarching initiatives. The annual reports from the different departments were also highlighted as gold mines of information in the evaluation process.

Since the KoF07 evaluation, the department has made significant progress. […] The level of funding, the number and quality of publications, attracting PhD students to each research group and instituting seminar series for students and faculty are improvements since 2007. The department has attractive space and adequate equipment for researchers. […] The department also seems to have a better working relationship with the County Council which improves the department’s research efforts.

The more critical comments often related to sub-critical group size, and lack of exploitation of synergies and collaborations between groups, locally and globally.

In KoF07 many of the activities were described as being somewhere between Top-quality and of Internationally high standard, or between Internationally high and of Internationally recognized standard. In KoF11, many more activities have been rated, and the panels have chosen to be more precise in their ratings, increasing the number of both Internationally high standard and Top-quality activities. The relative increase of Top-quality activities is the same as for the other domains. In contrast to the other panels the MP Panels have utilized the full rating scale, and rate a relatively higher number of activities as of Acceptable standard, or even Insufficient. However, it is not always the same activities that have been scrutinized, so any direct comparison on the unit level will not be relevant.
Results of peer-review ratings

The main task for the panels was to identify strong research and opportunities for renewal, and to assess quality according to a given rating scale. The panels find more than 90 research activities that are given the highest quality rating, Top-quality (outstanding work at world leading level with great international impact). These activities are found in over 30 (of 60) departments distributed over all three disciplinary domains.

The number of cases when panels describe research activities or groups in terms of Internationally high standard (excellent work, next to world-leading level) is about 140, including a few departments as a whole. Furthermore, a few panels judge research to be of very high quality without explicitly using the recommended quality ratings.

The rating Internationally recognized standard (very good work, attracting international interest) is found in approximately 70 occurrences.

Mentioning of research of Acceptable standard (good work, attracting national interest or has great relevance) is less frequent, in 30 cases. In KoF11 a fifth rate was introduced, Insufficient (not acceptable quality, activities should be revised or discontinued), and in a few cases the panels have discussed activities also in this category.

In Figure 2 the relative distribution of ratings is summarized, for both KoF07 and KoF11. The total number of “in-between”-ratings has decreased considerably, from 23% of the units/activities in KoF07 to 11% in KoF11. The number of units/activities commented upon but not rated has also decreased, from 33% to 21%. However, it is not always the same activities that have been scrutinized, so direct comparison on the unit level may not be relevant. As pointed out above,
the main task of the panels was not to grade *all* research, but to identify particularly strong research, emerging science and opportunities for renewal. It was not compulsory to present all research activities, and the limited space available for the self-evaluation, and limited time for presentations and discussions during the site visit, make it likely that not all activities were presented to the panel.

**Bibliometric studies**

**Introduction**

The bibliometric analyses were conducted as separate exercises, and the results were not available to the panellists at the time of the peer-review evaluation. There were several reasons for this. One reason was not to bias the panels and another was related to the differences between disciplines in terms of publication traditions, which lead to varying applicability of bibliometrics. The bibliometrics of the previous evaluation KoF07 report, however, was of course available to the panels.

In KoF07 some panels commented in detail on the use of bibliometrics and its applicability for different research fields. A panel within the Humanities and Social Sciences then concluded that:

> [...] bibliometric analysis is a productive tool to measure research outcomes, channels of scientific publication, impact, research collaboration etc. However neither existing international nor national databases opens for sound bibliometric studies of scientific productivity and quality in non-English speaking countries, nor in non-English scientific publications. The existing databases do not account for different traditions of scientific publications. This is especially the case in areas of humanities and social sciences.

A panel within Science and Technology also made a comment in KoF07 regarding the publication practices in information technology, where conference proceedings are regarded as very important:

> We are concerned that when only journal publications are used to evaluate faculty research, one not only gets the wrong picture of [the] research, but faculty are prompted to work along lines that may be less productive than they could be.

A later “evaluation of the (KoF07) evaluation” also exposed further discontent among some researchers from the humanities and social sciences with the bibliometric method used. Since the citation analysis only took into account articles and reviews from journals that were represented in Web of Science, a great deal of the publication activity from these disciplines was excluded.
Part II: Summary of the results

With these comments in mind, but also taking into account recent developments in bibliometrics, it was decided to conduct two different bibliometric studies in KoF11. The first one is identical methodologically to the one carried out in KoF07, and conducted by the Centre for Science and Technology Studies (CWTS) at Leiden University in the Netherlands. This study will make possible some comparisons between bibliometric results from KoF07 (relating to 2002–2006) and KoF11 (accounting for 2007–2009/2010).

The second bibliometric study was done in-house and is based on the national Norwegian model.

Methodology

External citation-based bibliometric study

The basis of the external bibliometric study was the publications available in the Web of Science version of the Science Citation Index (SCI) and the Social Science Citation Index (SSCI). Journal articles published during 2007–2009 and their citation impact during 2007–2010 were the main focus of the study. In the bibliometric analysis a number of indicators were generated. The basic indicators were the total number of articles published (P), total number of citations recorded without self-citations (TCS), percentage of self-citations (Self-cits) and percentage of papers not cited (Pnc). These were then used to generate figures regarding the mean number of citations per publication, the mean citation score (MCS).

In order to put the citations figures into context, two reference values were computed for each paper, based on the mean citation rate of the subfield in which the paper was published. The first reference value is the Mean Normalized Citation Score (MNCS, also called ‘crown indicator’). The MNCS relates the actual number of received citations to the expected citation scores taking into account the publication date, the document type, and differences in the citation characteristics between subfields. A MNCS value of 1.0 means that the department’s papers have been cited at the same rate as the world average for the field(s) in question. A score of, e.g., 1.3 means that they have been cited 30% more, etc. MNCS is comparable with the CPP/FCSm (average of the unit’s Citations Per Publication compared to the average citation rate of all articles in the sub-fields in which the unit is active), which was the value calculated in the KoF07-report. In this report, both the MNCS and CPP/FCSm values are presented so that they can be compared – also with KoF07.

The second reference value is the Mean Normalized Journal Score (MNJS), a weighted average of the MNCS of all the journals in which a unit publishes. If the MNJS indicator is above 1.0, the mean citation score of the journal set in which the research unit has published exceeds the mean citation score of all papers published in the subfield(s) to which the journals belong. One can then conclude that the research unit publishes in journals with a relatively high impact.
In order to be able to generate these normalized citation scores, a certain minimum number of publications subject to being indexed in the Web of Science databases is required. Some departments publish in a way that does not generate enough indexed publications in the databases to allow a statistically significant citation score to be calculated. This is mainly a result of differences in publication outlets and limitations in the databases. It is therefore important to recognize that the absence of departments in the results of the bibliometric study does not say anything about the impact of the research. Also, caution should be exercised for departments with a low number of indexed publications (typically below 50 publications).

**Internal publication channel-based bibliometric study**

The Norwegian model allows for a bibliometric analysis that also includes monographs and articles in anthologies as well as journal and review articles. The model focuses on the publication channel (i.e. journals and publishers) rather than citation frequency of individual publications. Journals and publishers are classified in three levels: non-academic, normal, or prestigious. Publications in the latter two categories are regarded as academic publications and the relative proportion of publications in each of these categories is used as an indicator of quality. The total number of (weighted) publications could also be compared with available resources such as research staff or research funding, and constitute some sort of benchmark for departments with similar research areas in different universities. This second study was conducted only for Humanities and Social Sciences, while the external citation-based study included all domains within Uppsala University. (Though, for many departments in the Humanities and Social Sciences the number of publications is too small to offer significant results for this study.)

**Results**

Before summarising the results it is important to put bibliometrics into context. The Leiden group, supplying the external bibliometric study, makes the following statement:

> In our view, a quality judgement on a research unit or institute can only be given by peers, based on a detailed insight into content and nature of the research conducted by the group or institute in question. The citation-based indicators applied in this study measure the impact at the short or medium term of research activities at the international research frontier, as reflected in publication and citation patterns. Impact and scientific quality are by no means identical concepts.

A specific limitation concerns the coverage of the Citation Indices (CI). In specific subfields, particularly in applied or technical sciences, the CI coverage may
be less adequate. Another example of a limitation of bibliometric analysis relates to time delays. It may take several years for a collection of papers to generate a high impact, and if updating results after a few years some research units may show a sharply rising impact curve.

In general, different results are obtained comparing KoF07 and KoF11 for a specific department, see Figure 3. Reasons for differences between the present study and the previous one include changes in (status of) participating researchers, differences in publications that are included, and a difference in the period during which citations are collected. In the interpretation of the figures, it should be taken into account that even with a quite high number of publications, a difference of 5% should not be taken as a result of a substantially different publication impact compared with the KoF07 report.

**External citation-based bibliometric study**

For the whole of Uppsala University, the number of Web of Science publications was 7,038 for the period 2007–2009. These obtained 44,673 citations, self-citations excluded, i.e. on average they were cited 6.35 times (compared to 5.32 in KoF07). 24% of the publications had not been cited at all (compared to 34% in KoF07). The number of highly cited papers, among the top 5% in their subfield, was 512. Among the most highly cited papers in their subfields, Uppsala University papers occur about 46% more often than expected. In KoF07 this figure was 43%. All but two of the ten faculties/sections exceed the expected number of top 5% most highly cited papers (NHCP).

The citation impact of Uppsala University researchers is significantly above international reference levels. The average impact of Uppsala researchers in relation to the research fields was found to be 1.39 (compared to 1.25 in KoF07), i.e. 39% above the world average. Above the University average were Biology (1.75) and Medicine (1.55).

The study also shows that Uppsala scholars on average publish in journals that have an impact that is 1.27, or 27% above the world-average (compared with 1.17 in KoF07). Above the University average were Biology (1.51) and Medicine (1.29).

In interpreting the results it should be kept in mind that the number of indexed publications varies considerably among disciplines, from 288 in Mathematics and Computer Science to 3,300 in Medicine.

**Internal publication channel-based bibliometric study**

The alternative bibliometric analysis (2007–2010) for the Humanities and Social Sciences performed in-house shows that articles in journals only contribute 40% of the total output and that articles from journals that are covered by Web of Science only contribute 9%. The total number of publications in Uppsala University’s publication database, DiVA, from the Humanities and Social Sci-
Part II: Summary of the results

Figure 3. Comparison for CPP/FCSm (‘Crown index’) between KoF11 and KoF07 at department level. Open circles are based on less than 50 publications and should be interpreted with caution (statistical significance not achieved).

ences is 8,488. Of these, 3,012 (35.5%) are regarded as scientific publications according to the Norwegian model classification. The distribution between the two scientific levels is 72.8% (normal) of the publications in level 1 and 27.2% (prestigious) in level 2.

A comparison with the Norwegian universities shows that in 2010, 23.3% of all their scientific publications were assigned at level 2. Since the share of publications classified as level 2 is usually higher in Science and Medicine, and these are not included in our internal bibliometric study, the results for Uppsala University is quite satisfactory. The percentage of publications in the prestigious category (level 2) also well matches the findings in the recent research evaluation at the University of Gothenburg, where 23.6% of the publications were in level 2 for the whole university.

The two departments with the highest proportion of publications in prestigious level 2 journals or publishers are the Department of Social and Economic Geography and the Department of Peace and Conflict Research, both with nearly 50%. The Department of Psychology also shows a high proportion of level 2 publications (40%). The Faculty of Languages shows a high proportion of level 2 publications in nearly all departments. In the Faculty of Arts we find a more diverse situation, with some departments or units evincing well over 30% of their publications at level 2. Some departments show low figures of level 2 publications, but at least in some cases this can be explained by a strong tradi-
Part II: Summary of the results

tion of publishing in Swedish in the respective disciplines. This is a disadvantage when using the Norwegian model since the channels on level 2 are mostly in English.

Finally it should be noted that the Norwegian model has been used for allocation of research funding for some years within the Faculty of Social Sciences. It can be expected that the departments in this Faculty to some degree have adjusted their publication strategies towards the Norwegian model to maximise funding. Other faculties have not yet had this incentive to take into consideration the Norwegian model in their publication strategies.
Part III: Panel Reports

In the following chapters the reports from each panel are included. The reports have been technically edited to comply with the graphical profile of Uppsala University and with the general layout of KoF11.

**Distribution of sciences, departments and units on panels:**

Panels 1–11  Humanities and Social Sciences  
Panels 12–18  Science and Technology  
Panels 19–24  Medicine and Pharmacy

*Panel 1. Economics, Statistics*  
  Department of Economics  
  Department of Statistics

*Panel 2. Business Studies, Social and Economic Geography, Informatics and Media*  
  Department of Social and Economic Geography  
  Department of Informatics and Media  
  Department of Business Studies

*Panel 3. Education, Sociology, Food, Nutrition and Dietetics*  
  Department of Curriculum Studies  
  Department of Education  
  Department of Studies in Education, Culture and Media  
  Department of Sociology  
  Department of Food, Nutrition and Dietetics  
  Physics Education Research in the Department of Physics and Astronomy

*Panel 4. Government, Peace and Conflict Studies, Russian and Eurasian Studies, Housing and Urban Research*  
  Department of Government  
  Centre for Russian and Eurasian Studies  
  Department of Peace and Conflict Research  
  Institute for Housing and Urban Research

*Panel 5. Psychology*  
  Department of Psychology
Part III: Panel Reports

Panel 6. Modern Languages – Linguistics and Literary Science
- Department of English
- Department of Linguistics and Philology
- Department of Modern Languages
- Department of Scandinavian Languages

Panel 7. Early Languages and Cultures
- Department of Linguistics and Philology
- Department of Scandinavian Languages

Panel 8. Aesthetic-Philosophical disciplines
- Centre for Gender Research
- Department of Art History
- Department of Literature
- Department of Musicology
- Department of Philosophy

Panel 9. Historical-Anthropological disciplines
- Department of Cultural Anthropology and Ethnology
- Department of Archaeology and Ancient History
- Department of ALM (Archives, Libraries, Museums)
- Department of History of Science and Ideas
- The Hugo Valentin Centre
- Department of History
- Department of Economic History

Panel 10. Law
- Department of Law

Panel 11. Theology
- Department of Theology

Panel 12. Mathematics and parts of Information Technology
- Department of Mathematics
- Department of Information Technology
- Centre for Image Analysis

Panel 13. Physics
- Department of Physics and Astronomy

Panel 14. Chemistry
- Department of Biochemistry and Organic Chemistry
- Department of Physical and Analytical Chemistry
- Department of Photo Chemistry and Molecular Science
- Department of Materials Chemistry
Part III: Panel Reports

Panel 15. Biology
Department of Cell and Molecular Biology
Department of Organismal Biology
Department of Ecology and Genetics

Panel 16. Earth Sciences
Department of Earth Sciences
Global Energy Systems in the Department of Physics and Astronomy

Panel 17. Engineering Sciences
Department of Engineering Sciences

Panel 18. Information Technology
Department of Information Technology

Panel 19. Pharmacy
Department of Pharmaceutical Biosciences
Department of Medicinal Chemistry
Department of Pharmacy

Panel 20. Pre-clinical research
Department of Medical Cell Biology
Department of Medical Biochemistry and Microbiology

Panel 21. Public Health and Caring Sciences
Department of Public Health and Caring Sciences

Panel 22A. Clinical Research
Department of Medical Sciences
Department of Women’s and Children’s Health

Panel 22B. Clinical Research
Department of Surgical Sciences
Department of Radiology, Oncology and Radiation Science

Panel 23. Neuroscience
Department of Neuroscience
Geriatrics in the Department of Public Health and Caring Sciences

Panel 24. Immunology, Genetics, Pathology
Department of Immunology, Genetics and Pathology
Ludwig Institute for Cancer Research
**Panel 1**

*Scope of the panel’s evaluation:*
Department of Economics
Department of Statistics

**Department of Economics**

**Summary**
The department is well organized. The research conducted at the department maintains top international standard. It is concentrated around three main areas, namely labour market economics, public economics, and macroeconomics.

Plans for future research are ambitious but nevertheless realistic, given the solid research record of the department. By implementing their plans the researchers at the department will most likely make lasting and important contributions at the international research frontier. Carrying out the research plans requires an increased amount of resources. They are needed in order to finance postdoctor fellows and assistant professors with longer contracts than has been the practice at Uppsala University. In particular it is of importance that the Centre of Fiscal Studies receives funding that makes it possible to extend its activities at the current level beyond 2014. Although there has been a clear improvement in recruiting qualified researchers and postdocs from abroad since KoF07, there is still scope for more international recruitment. To reach this goal, however, the department should aim at offering clearly defined tenure track positions.

**General assessment of the department**
The Department of Economics at Uppsala University is well organized and functions with the highest efficiency at all levels. Research is organized into groups headed by professors and they consist of other faculty, postdoctoral fellows, researchers, and doctoral students. There are regular departmental seminars, but also mini-courses for researchers/PhD students given by top foreign economists/econometricians. The newly introduced centres have been instrumental in focussing research activity, organize workshops, meetings, courses and visits from top international scholars. There is an atmosphere of cooperation and collaboration between faculty, postdocs, researchers, and students.

Seven to ten students are admitted to the PhD program annually out of a pool of applicants that is 10–12 times larger, and a high percentage graduate with doctor’s degrees. Most of the PhD students, however, are from Sweden and in particular undergraduates from Uppsala University. In the current stock of PhD students (40) 20 per cent are from abroad. This is an improvement
since KoF07, but a larger proportion of good foreign students could have a positive impact on the quality of research at the department. This would require a more extensive promotion of the doctoral program abroad and a more intensive selection process. The main reasons given for choosing the PhD program at Uppsala University is the good reputation of the department and the quality of the program, but lack of information about other opportunities was also mentioned. The normal length of study is 4 years. If teaching, as most of the students do, the period is extended by 6–12 months. In the first and second year the students do course work and take exams.

The PhD students find their supervisors helpful and readily available, but at the same time independence of thought is encouraged. The students are stimulated and supported to spend part of their study period abroad, although not all do. By the time doctoral students graduate they have produced three or four papers, depending on whether or not they have co-authored, for instance with their supervisors.

Both faculty and graduate students are mostly Swedish speaking males. There are 15 full professors, including one senior professor and one guest professor, six associate professors, and a number of postdocs and researchers, five of which from abroad. Two professors, Bertil Holmlund (64) and Sören Blomquist (63), who have been pivotal in organising research at the department (labour market economics and public economics) and in recruiting PhD students and researchers, some of them from abroad, are approaching retirement age. Although there are good professors at the department who are much younger, there is a clear need to start the planning process of recruiting professors of the same high scientific quality.

Quality of research
The assessment of the quality of research in the Department of Economics is based on the self-evaluation report, additional publication lists and discussions during the site visit. According to this report the three most important areas are: labour economics, public economics, and macroeconomics. Given the size of the department, the quantity of research output in international journals is very large. These include top field journals in economics and econometrics. Weighed with other evidence we find that the quality of the three aforementioned research areas is somewhere between top-quality and internationally high standard.

In addition to the research in the three main areas mentioned above the research in other areas, such as microeconometrics and political economy, is also of high quality. The panel also found evidence of dissemination of research among the general public, with members of the department being routinely asked to participate to government commissions and committees.

Research environment and infrastructure
The research environment at the department is active and stimulating. There
are regular workshop series related to the three central research areas of the department. In addition, there is a less frequent departmental seminar where economic themes of common interest are taken up and discussed. Furthermore, there are regular seminars at IFAU (Institutet för arbetsmarknadspolitiska utvärderingar), and many speakers in those seminars also give talks in departmental workshops. Close ties with IFAU in general enrich the research environment of the department.

Since KoF07 long-term senior visitors filling postdoc and research positions (five since 2009) are present. The two newly introduced research centres, The Uppsala Centre for Labour Studies and The Uppsala Centre for Fiscal Studies have further increased the opportunities for inviting both long and short term foreign visiting professors, organizing thematic workshops and seminars. This has clearly a positive effect on the research environment, and there should be room for attracting more foreign visitors on long-term contracts. The university should have financial support available for first-class foreign scholars who want to spend their sabbatical leave, or a part of it, at Uppsala.

The department offers financial support for junior faculty who present papers at scientific conferences. This means increased possibilities for these people to present their work internationally and meet and interact with colleagues from other parts of the world.

The neighbouring IFAU provides to a high degree the infrastructure for empirical research in the department. The availability of high-quality data registers at IFAU opens up rich possibilities of doing high-quality quantitative research at the department.

Networks and collaborations
The department is very well connected to several international networks. Individual researchers collaborate with researchers worldwide.

Opportunities for renewal and emerging science
All three research programs in the department have an excellent research history with many good publications in leading international journals and with an output of a substantial number of good PhD graduates. Many of these graduates have important jobs in the public and private sector in Sweden. Examples are private banks, the Ministry of Finance, the Riksbank (the Swedish Central Bank), and universities. The programs have thus played an important role in the production of skilled academic labour in Sweden. The leading professors in the programs have also had editorial positions in top international journals such as *Journal of Public Economics* and *Scandinavian Journal of Economics*.

Since 2010 The Uppsala Centre for Labour Studies at the department is a Labour Market Centre of Excellence. This Centre has a funding lasting for 10 years. It will enable the Department of Economics to expand their PhD program and to recruit researchers from abroad.

At the centre research will focus on education economics, social insurance,
labour market institutions and analysis of a variety of natural experiments, also randomized. Complex econometric models will be estimated on detailed data sets, which require the use of advanced microeconometric methods. This work is of interest, not only to the scientific community, but also to policymakers in Sweden and elsewhere in the world. Public conferences will be held with the purpose of communicating research findings to a wider audience.

Including PhD students there are around 20 persons in the department that do research in public economics and related subjects. Most of the work is organized through The Uppsala Centre for Fiscal Studies, which was founded in 2008. The centre is funded by grants, which expire in 2014. It organizes various activities such as workshops, seminar series, working paper series and conferences. The visitor program is impressive with many well-known international economists participating. The research areas are related to taxation topics, pension and public spending. The research program is ambitious but realistic, given the large number of researchers and the scientific prominence of the senior faculty. The publications record indicates that the research is of high international quality. For the department it is of great importance that the Centre of Fiscal Studies gets funded also after 2014.

The plans for the future in the macroeconomic program will concentrate on the investigation of the microeconomic foundations of new Keynesian macroeconomic models. Theoretical models will be developed and discussed at length. The rich register datasets available at the department and IFAU provide very good possibilities for doing this type of empirical work. This research is very important, in particular in these days when much of the macroeconomics around the world, and affecting the thinking of policymakers, is rooted in macroeconomic models that are based on overly simplified representations of microeconomic behaviour. Since KoF07 research has been done along the lines mentioned above. The research program includes various theoretical topics, but also an increasing number of papers with an empirical focus.

In order to implement the ambitious plans of the Department of Economics good researchers and PhD students are needed. In each of the programs there are very active full time professors, and judging from the present situation, the department has been able to recruit very good PhD students. Lately, good researchers and postdocs have been recruited on the international job market. For the postdoc researchers, the combination of salary and little teaching presently offered seem to be satisfactory to compete internationally in attracting high-quality researchers. But in order to keep them, more satisfactorily and more transparent long-term job prospects must also be put on the table. In general it may be difficult for a university to match the salary in private banks and the like. Nevertheless, those interested in advanced research may be willing to work for less money (at least for a while), provided that the other conditions are satisfying. Examples of such conditions are long-term job contracts, at least longer than the present ones, and a teaching load that makes it possible to do a satisfying amount of research.
**Actions for successful development**

To maintain the excellent quality of the current research programs there are a number of problems that need attention. Recruitment is one of them. Two of the 15 full professors are nearing retirement, and one is a senior professor already. It is thus important to devise ways to ensure that the positions be saved within the department. Otherwise, quality will be affected in terms of loss of research leadership, graduate student supervision, and program balance. In the area of macroeconomics, teaching loads, and perhaps also wages, at Uppsala University are not competitive conditions with the outside market even within Sweden. There have been examples of problems in recruiting good macroeconomists.

Another recruitment issue is the length of appointments for postdoctoral fellows – two years. This is not enough for a fellow to complete a project, especially if there are commonly occurring challenges, such as a childbirth. This last possibility may explain why there are so few female postdoc fellows in the department.

**Effects of the KoF07-evaluation**

Reacting to the KoF07 panel evaluation, the department has introduced several changes, mainly related to the recruitment of junior researchers and to a more institutionalized organization of research. There has been a clear effort to make the department more international and more integrated with leading research groups and scholars abroad. Since 2008, the department has started recruiting at the international level, participating in the main job markets for economists both in the U.S. and Europe. Ten foreign postdocs and researchers have been hired with 2+2 or 3+3 programs, five of whom are still with the department. The department has retained one of the two full professor positions after the retirement of two previous chairs. A guest professor has been hired for five years. Also, two new research centres have been introduced, one in public economics and the other in labour economics, both with large amounts of resources. This extra money has made it possible to invite a substantial number of long-term visiting scholars (with a stay longer than three months), whose number has increased six fold since 2003–2007. This has also enabled the department to increase the number of stays abroad for the faculty and students.

**Other issues**

During our meetings we have noted that the Swedish system of job classification as researchers or postdocs, assistant professors, associate professors, promoted professors and full professors has severe shortcomings. First, the teaching load is very unevenly distributed as the associate and promoted professors are full-time teachers unless they receive research grants. Second, the system does not offer a straightforward career path. This causes uncertainty among young researchers and is strongest in the case of foreigners and female researchers. As a result, it may get them to pursue other goals than a career at Uppsala University.
In the Department of Economics the problem is that foreigners cannot understand the promoting system and have difficulty seeing how they can make a career in Uppsala without ending up teaching much more than they have to do at other universities. Therefore, Uppsala University risks to lose too many of the new international recruits.

It is highly recommended that Uppsala University change the system of promotions so that it conforms to the international practice.

Department of Statistics

Summary
The panel finds that the present independent status for the department should be maintained so that its new status as a department can be consolidated. However, with its current size, the department is vulnerable to all sorts of uncertainty. We recommend that the Department of Statistics make an effort to increase the present level of external funding in order to create more research opportunities. Such funding would also make it possible to form a larger group of teachers, which in turn would alleviate the problem of heavy teaching load of members of the department.

General assessment of the department
The Department of Statistics in the Faculty of Social Sciences achieved international prominence under the leadership of Herman Wold and Karl Gustav Jöreskog. After Jöreskog retired in 2000 the Department of Statistics was amalgamated with the Departments of Computer Science, Human–Computer Interaction, and Media and Communication Studies to form a single Department of Information Sciences. Following a recommendation to the university of the KoF07 evaluation, the former Division of Statistics was transformed back into one department what is now the Department of Statistics within the Faculty of Social Sciences, subject of the present evaluation.

The department is composed of 2 full professors, 1 promoted professor, 6 associate professors, and 1 assistant professor. There are 9 PhD students.

The research of the department can be divided into three areas: Time Series Econometrics (TSE), Structural Equation Modelling (SEM), and biostatistics. The research in TSE has the leadership of two professors and is of high international standard. The research on SEM has the unique feature that it has been carried out under the surveillance of the most prominent and historic figure on the field, the emeritus professor K. G. Jöreskog. This research continues the long tradition on multivariate and factor analysis in this department. In fact, SEM is a form of multivariate analysis that was developed by K. G. Jöreskog in the early 1970s which has revolutionized the way multivariate analysis is applied in
a wide range of disciplines in several social sciences, such as marketing, business studies, health and environmental sciences. In spite of this uniqueness of SEM in Uppsala University, the permanent research staff in the department devoted to this topic is hardly sufficient to secure its survival.

The department has a Working Paper Series and runs a regular seminar program. The department produces about 2 PhDs per year. The department has initiated a collaborative network with the London School of Economics for interchange of Doctoral Students.

The department has a Master Program in Statistics with about 30 students per year. A high percentage of students in the master program are from abroad, especially from China. The department is also active in consulting within the Faculty of Social Sciences.

Quality of research
In its self-evaluation document the Department of Statistics mentions two areas of research: time series econometrics and structural equation modelling. In addition, there is applied biostatistics research. The two main areas have been extensively discussed during our site visit.

Of the two main areas the time series econometrics group of the department is the largest one. It consists of two professors, one associate and one assistant professor as well as a number of PhD students. We regard the group as maintaining an internationally high level, with a number of publications in top journals. The members are working on broadening the spectrum of their research to include dynamic panel data modelling.

The structural equation-modelling group is very small. The group and thereby statistics in Uppsala have a very good international reputation. One associate professor is the only senior faculty, and there are a few PhD students. During the past two years the associate professor has a temporarily reduced teaching load, and has therefore managed to publish quite a few papers. It is our view that this group has been of top-quality, but the current lack of critical mass makes it hard to assess its full scientific potential.

Research environment and infrastructure
Since KoF07, the research environment of the Department of Statistics has clearly improved. Four renowned senior researchers have retired, however, they still play a role in the department as Emeriti. A new professor (promoted) and new assistant professor have been employed, both with considerable time left for research. The average age of the two remaining chairs (45 years) is particularly low even by international standards. The number of doctoral students has risen to nine and there is a plan to recruit three new PhD students in 2011. Admittance to the doctoral program is based on a competitive selection process. A weekly seminar series has been introduced together with a new Working Paper series. Doctoral students appear to be satisfied both with the courses they attend and the supervision they receive, praising the “open door policy” prac-
tised by the staff. PhD students belong to a national and international course network.

Nevertheless, the small size of the department is a matter of concern. Out of the ten permanent staff, only five seem to be actively involved in research. The situation is difficult for the time series econometrics research group, but it is really worrying when it comes to the SEM group. There also seem to be serious difficulties in raising enough external funding to support academic research and free active researchers from excessive teaching burdens. Out of the total turnover of SEK 20 million, less than 10% is covered by research grants from external sources, a figure well below that of other departments.

Networks and collaborations
While the collaboration with other national and international research groups has improved (both some staff and some students have recently spent research periods abroad in the U.K. and the U.S. and there is a new exchange programme with the London School of Economics), the department has had no long-term foreign visitors in recent years.

There seems to be little local research collaboration. Time series econometricians do not interact much with their microeconometric colleagues at the Department of Economics or IFAU, although strengthening research efforts in macroeconomics in the former may open the door to more fruitful collaboration in the future (macroeconomic research makes use of time series techniques). Furthermore, there is little local collaboration with the SEM group, in spite of the fact that these statistical tools are widely used both inside the realm of social sciences (psychology, sociology, business, etc.) and outside (e.g., in medicine, health and environmental science). The newly introduced consultancy role for the department (financed by the Faculty of Social Sciences) may lead to enhanced collaboration with these disciplines in the future, but it has yet to produce visible effects. Given the applicability of structural equation models, there may be a point in enlarging the collaboration with university departments even outside the Faculty of Social Sciences. However, this would require a substantial reinforcement of the SEM group.

Connections to other departments and universities are very unevenly distributed among faculty. Some persons do have a widespread network and are writing papers with well-known scholars in other countries.

Opportunities for renewal and emerging science
As already mentioned in the section on developments after KoF07, the statistics department has three research directions: time series econometrics, structural equation modelling, and biostatistics. The research of time series econometrics group is concentrated on the analysis of nonstationary time series, including testing the unit root hypothesis in panels, panel data econometrics more generally, and modelling volatility. Since many panels that the economists in Uppsala are concerned with have a large individual dimension and short time dimension
("large N, small T"), working on the corresponding type of asymptotic theory should offer interesting research problems and room for collaboration with the Department of Economics. Furthermore, interest in panel data econometrics may make it possible to think of some kind of collaboration with the structural equation-modelling group and IFAU.

The interests of the time series econometrics group also comprise financial econometrics, and the work in that area has focused on univariate models of conditional variance. During the last ten years or so, financial econometricians have turned their attention to and made substantial research contributions to modelling high-frequency (intra-daily) time series. In theory it would be possible for the department to direct new work in financial econometrics to this area. In practice, however, the field is already rather crowded, and getting into it and making contributions would probably need a long-term investment and a critical mass of researchers interested in the topic.

Another area where the department could leave its mark is multivariate models of volatility. In that area there is still work to be done, and given the interest of the researchers of the time series econometrics group in multivariate conditional mean models, extending the considerations to models of conditional variance could be a natural step to take. Joint modelling of the first and the second moment could also be considered. As for joint applied work with financial economists, it is probably necessary to look beyond Uppsala University, because financial economics is not one of the strong points of the university.

In discussions with members of the department it turned out that analyzing climate change using time series techniques is emerging as a possible research topic there. There is no doubt potential for interesting and useful statistical contributions to that area. The large variety and availability of time series data on various climate indicators should create ample opportunity to do serious applied work jointly with local experts on climate and climatology.

Structural equation modelling has long a tradition at Uppsala University and the world leader in the field, K. G. Jöreskog, despite having retired a number of years ago, is still spending time at the department and carrying out research in this area. Nevertheless, this research group is dangerously small, and any opportunity for renewal would require finding a prominent figure to lead the research efforts in this area. This would require that the university establish a chair for that purpose (Jöreskog’s was discontinued when he retired). An effort should be made to attract graduate students whose principal research interest already upon arrival would be structural equation modelling. Other means of raising the profile of the university in this field should be considered. Losing the “Jöreskog brand” is something that the Department of Statistics and more generally, Uppsala University, could ill afford.

The newly appointed professor who now works in biostatistics stands apart from these two main directions of research. The panel has not had an opportunity to hear the professor in person about his research interests or plans for the future.
**Actions for successful development**

The panel finds that the present independent status for the department should be maintained so that its new status as a department can be consolidated. However, with its current size, the department is vulnerable to many kinds of uncertainty. We recommend that the Department of Statistics make an effort to increase the present level of external funding in order to create more research opportunities. Such funding would also make it possible to form a larger group of teachers, which in turn would alleviate the problem of heavy teaching load.

It is worth noting that the department has a 40% share of a full time job from the Faculty of Social Sciences, enabling it to serve as a consultant for other researchers within the faculty. This arrangement could be extended to the university level in which case the department should be given sufficient resources for the purpose. However, we recommend that the consultancy be better organized as a way of integrating researchers from the Department of Statistics with ones from other departments of the university. The ideal is that statisticians would become co-authors and able to raise money for their department through participation in projects funded at other departments of university. A better organization should also secure that the arrangement is efficiently used given that the user is not paying for the direct costs to the consultant from the Department of Statistics.

The panel finds that the university is at crossroads with respect to the future of the SEM group because the group is too small. The university should decide whether it wants to benefit from the brand name of SEM/Wold/Jöreskog or not. If it does, it is necessary to create the critical mass by employing more researchers at all levels. Besides, more should be done to let users of SEM all over the world know that Uppsala is the origin of SEM. This could be accomplished by instituting a regular event with an invited Jöreskog lecture and reward the best PhD thesis worldwide in SEM. In order to enhance the renown of this group the associate professor should be given satisfactory research conditions. One or several postdoc researchers should be added as well.

**Effects of the KoF07-evaluation**

The largest change since the previous evaluation is that statistics is now a separate department within the Faculty of Social Sciences. This has given the department a possibility to better concentrate on its core research activities and strengthens its position as the main provider of courses in statistics within the university. The number of main research areas has shrunk from four in the previous report to three, because geophysics and related statistical activities as a separate area have been discontinued as a result of a retirement. The new promoted professor in biostatistics has yet to make his mark, and at the moment there is not much to say about his role at the department.

The new department is still small, but since the previous report the faculty has been increased by a new professor (promoted) as well as a new junior lecturer. Recruitment and supervision of graduate students has been reorgan-
ized and made more systematic. Every graduate student has two supervisors, a principal one and a supporting one. There is a monthly regular meeting of the student and the main supervisor. Furthermore, as the department even after including the graduate students is small, the students have an easy access to their supervisor and when interviewed, appeared quite happy about the current state of guidance and help they receive in writing their dissertation.

The age structure of the department has changed with recent retirements. The current full professors are fairly young and appear able to provide much needed leadership.

Research collaboration or the lack of it is an issue that was mentioned in the previous report. In this respect, not much has changed. Nevertheless, current research interests of the time series econometrics group should make it possible to collaborate with economists, many of whom are working with large panel data sets. The Structural Equation Modelling group has unrealized potential for collaboration at the faculty but also at the university level.

Other issues
During our meetings we have noted that the Swedish system of job classifications as researchers or postdocs, assistant professors, associate professors, promoted professors, and full professors has severe shortcomings. First, the teaching load is very unevenly distributed as the associate and promoted professors are full time teachers unless they receive research grants. Second, the system does not offer a straightforward career path. This causes uncertainty among young researchers and is strongest in the case of foreigners and female researchers. As a result, it may get them to pursue other goals than a career at Uppsala University.
Panel 2

Scope of the panel's evaluation:
Department of Social and Economic Geography
Department of Informatics and Media
Department of Business Studies

Introductory remarks
This panel was charged with reviewing three departments in the Faculty of Social Sciences: the Department of Social and Economic Geography, the Department of Informatics and Media, and the Department of Business Studies. The report is accordingly divided into three major sections, and follows the template provided for the review by the university. In addition to the general programme set up for the panel by the university, we asked each department to set up informal small group meetings with doctoral students and junior faculty, as an additional input to our assessment of the research environment. All three departments are to be commended for setting this up very effectively at short notice.

Department of Social and Economic Geography

The Department of Social and Economic Geography (SEG) is one of the five major research institutions in human/social and economic geography in the Swedish higher education system. Its present structure was created in the 1940s after the split of the Department of Geography into physical and human/economic branches. It is characterized by a broad scope of research topics within the larger field of human and economic geography, and is furthermore actively participating in a large number of multidisciplinary activities, particularly together with colleagues in business studies, economic history, economics, political science, sociology and informatics. The department has been successful in attracting external research funding during the last decade, and is by far the largest in Sweden when it comes to number of PhD degrees. The creation of an independent ‘Institute for Housing and Urban Research’ (Institutet för Bostadsforskning – IBF) in 1994 and located in the town of Gävle, 100 km north of Uppsala, became an important source of complementary funding in the sense that it gave senior faculty members and PhD students in the field of population and urban geography an opportunity to combine policy-oriented studies in close connection with the society with own research. The present director of IBF is also professor at the SEG. Another important unit that has served as a
source of external funding for research and development at the SEG is the Centre for Innovation and Industrial Dynamics – CIND – established 2003, mainly financed by VINNOVA and ‘The Bank of Sweden Tercentenary Foundation’. The SEG has today an annual income of around SEK 30 million, of which 40 per cent is from research through government funding, 34 per cent is from undergraduate education and 26 per cent is from external research funding from various sources. The faculty contains 5 professors (2 chairs and 3 promoted), 7 senior lecturers, 5 postdoc researchers and 15 PhD students. The educational assignment amounts to about 250 full-time student equivalents. In addition the SEG hosts the national research school in geography with 25 postgraduate (licentiate) students.

General assessment of the department

During the decades following the administrative division of the discipline of geography into physical and human/economic parts, the SEG developed into a broad human geography department with no significant focus on any specific research field, but with a certain profile towards long-term industrial transformation, location theory, population and settlement studies and regional development planning. At the time of the KoF07 evaluation, the SEG had recently undergone a period of rapid growth, due to the injection of new external financial resources through IBF and CIND between 1995 and 2005. The research was at the time of the last assessment divided into two main study fields – economic geography and population/social geography, respectively – and one more loosely connected group, dealing with landscape, environment and societal transformation, including development studies and applied environmental impact assessment.

As a direct result of the research assessment in KoF07, the SEG decided to create a new research organization, consisting of four broad themes:

- Theme 1: Culture, Creativity and Economy
- Theme 2: Innovation, Industry and Regions in Change
- Theme 3: Spatial Planning and Sustainability
- Theme 4: Mobility, Space and Identity

The key objectives of the new organization were to build a better platform for enhanced internationalization, to improve the career system for its members, to create well-functioning and creative milieus for research and teaching, and to promote cross-disciplinary work. The main underlying purposes were also to improve the intradepartmental collaboration and to reduce the mental barriers between different research fields. Each staff member is encouraged to belong to more than one theme.

The first two themes share a common background and the logic behind the split between them from a pure academic viewpoint is not completely clear, even though it could be argued that the creativity theme deals more explicitly with ‘softer’ aspects in industrial geography by exploring ‘cultural indus-
tries’, while the innovation/industry theme has traditionally been more focused on high-technology firms, labour mobility, finance, etc. If members of the two themes continue to interact closely, the necessary critical mass of the former economic geography group can be maintained, but if the two themes drift apart, the compound strength of their research might be diluted. On the other hand, a more narrow research focus within the two respective themes may be an advantage in applying for external funding. Each theme is led by a distinguished and internationally well-reputed scholar, both in the top category when it comes to publishing in the best journals, having excellent international networks, and being frequently cited, according to Google Scholar.

The third theme is still very much centred around the IBF-related research, although good attempts have been made to put it together with the well-established tradition in the department to follow the transformation processes in the Baltic states. By doing this, the group has widened the opportunity to use experiences from Swedish physical and spatial planning in countries under transition, and also to look at the relationship between processes operating simultaneously on the local and national/global level. The international network is excellent, and the IBF can be seen as one of the leading centres for urban and housing research in Europe, and its director is an internationally recognized authority in this field. Furthermore, the attempts to ‘recapture’ the physical side of geography by externally recruiting a researcher specializing in environmental sustainability aspects of planning could be seen as a bringing in new hitherto neglected aspects of regional landscape dynamics and change.

The fourth theme is the most difficult one to categorize and to assess as a coherent theme. The common denominators are local/national mobility and identity, although these concepts could very well be adapted to research problems in the above-mentioned three themes as well. It should be noted that this theme has no natural common convener and scientific leader at the professorial level. The panel strongly suggests that the various research topics and the separate individuals who are grouped within this theme should consider whether there are alternative research groups at other social geography department in the Stockholm/Uppsala region or groups in neighbouring disciplines in Uppsala, which could provide a better potential future for their projects. Another option could be to integrate this theme closer with theme 3.

Quality of research

Theme 1: Culture, Creativity and Economy. – The issue of ‘newly’ emerging industries within the broad field of culture – music, film, fashion, visual arts, games, etc. – all built more or less on the elusive, though useful, concept of ‘creativity’, has been rapidly rising in social science research during the last 10–15 years, and the Uppsala department was early in exploring the potential impact of this development. This endeavour has resulted in a number of innovative and widely acknowledged doctoral dissertations, and, later, in a number of papers published in good and top-ranked journals. The theme convenor has also
an instrumental role in defining new measurement indicators for the cultural industries at the European level through an assignment by the DG Enterprise and Industry within the European Commission. It should also be noted that the group is intellectually further supported by the affiliation of professor emeritus Gunnar Olsson, one of Sweden’s most internationally well-known geographers, into the theme. As was mentioned above, the split of this theme from the previous economic geography group can be disputed, but can be motivated by demonstrating a more distinct and coherent research plan in competition for external funding at the national and European level.

Final quality assessment: Internationally high standard.

Theme 2: Innovation, Industry and Regions in Change. – This theme has previously constituted the core of the economic geography research group, financially supported within the CIND framework, and being extremely successful during the last ten years in gaining international reputation and in being an active partner in well-reputed international networks. The combination of an active senior staff member, the chairholder in economic geography, whose works together with colleagues in Copenhagen, Manchester, Toronto, etc. have been widely cited, and a large number of recruited PhD students through CIND funding has contributed to this success, and the number of PhD graduates who have managed to attract external funding as postdocs and to independently publish in good international journals has further leveraged the reputation of this group.

The uncertainties regarding the future of CIND and the likewise uncertain prospects of long-term financial stability is at present the largest challenge for this theme, and is a matter of strategic concern. The supervisory capacity of the group has furthermore been reduced by the fact that the theme convenor has served as dean of the social science faculty during the last three years. As was indicated above, a more formal collaboration between the first two themes, at least in the internal organizational structure, could diminish the vulnerability, since it is of utmost importance that this very well established research tradition should be kept and strengthened in the future.

Final quality assessment: Internationally high standard.

Theme 3: Spatial Planning and Sustainability. – The highly successful research group in population and social geography with a close relation to IBF in Gävle has been expanded into a larger theme incorporating broader issues of physical and spatial planning. An excellent research infrastructure, including the building up of a unique database – PLACE – on individuals, house and workplace at a very detailed level, containing more than 11 million persons, has constituted a formidable platform for policy-relevant commissioned reports in housing and urban planning, ethnical and economic residential segregation, at the same time the members of the group have been actively contributing to the international literature, and have gained international reputation for solid empirical studies.
and theoretical development. There is a delicate balance, though, between focus on international recognition through publications in top-tier journals and through research monographs, and serving important national policy role.

The merger of the IBF affiliated group with colleagues who have been active in studying the spatial transformation of formerly centrally planned economies in East/Central Europe, led by the second chairholder at the department, provides a potential opportunity to gain synergy effects, particularly when it comes to theoretically combining different societal contexts at different levels, but these possible opportunities remain to be shown during the next years. The chairholder belonging to the other group is moreover about to retire shortly, and it is another main challenge of the whole department how to manage the generational shift. An innovative move has been taken through the international recruitment of a professor in physical geography in order to revitalize geography’s previous role as ‘Gefügekunde’ between natural and social sciences. The objective is to better incorporate physical aspects in social science-based models of environmental resource management and planning.

It should finally be noticed that the IBF as an independent institute will be evaluated in another panel (panel 4), so the academically appropriate ‘home’ for this highly successful unit is still unclear. The quality assessment of the theme preassumes that the director of IBF is included in the group.

Final quality assessment: Internationally high standard.

Theme 4: Mobility, Space and Identity. – The general idea of this theme is to put together researchers, who with different backgrounds and perspectives relate to notions of home and identity, and with the relationship between mobility and identity. This is a fascinating field of research that is represented in many other social sciences as well, e.g., sociology, media and communication studies and ethnology/cultural anthropology. There seems, though, to be relatively little attention paid to mobility research in other geography- and social science departments. Some of the participants in this theme are doing high-quality research and have been successful in publishing in leading journals, although the panel has not been persuaded that there is a clear and coherent logic that unites the individual researchers, and creates better career opportunities and international recognition compared to joining other scientific communities, in neighbouring disciplines or in social geography departments elsewhere. A strategic move to overcome this criticism could be to seize the opportunity of the coming generational shift at the professorial level by announcing a new chair in human geography with a specialization in mobility, space and identity. A permanent chairholder with a distinguished academic track record in this field should at the same time take the responsibility for the coordination of research activities within this theme.

Final quality assessment: Acceptable standard.
Research environment and infrastructure
The general research environment of SEG has been excellent and presumably better than in other social/economic geography departments in Sweden. The contributions of IBF and CIND in this respect have been instrumental to create long-term financial stability and to provide for the building up of a unique database for housing and mobility research. The position within a strong faculty of social sciences, and the location together with neighbouring disciplines at ‘Ekonomikum’ provides opportunities for cross-disciplinary research through a more conscious strategy at the faculty level to reduce the mental barriers between departments, although this potential has not been utilized as much as could have been the case.

The forthcoming move of IBF from Gävle to Uppsala will even more strengthen Uppsala’s role as a leading national and European centre for housing and urban research.

Networks and collaborations
The SEG has been very successful in building up national as well as internal research networks, partly within the IBF and CIND frameworks, partly through the implementation of a deliberate strategy to encourage international cooperation through the support of PhD students and junior researchers to participate actively through paper presentations at international conferences, and, generally, to engage in international networks. All staff members seem to have been active in such networks. The PLACE database could play an instrumental role in forging collaboration with neighbouring disciplines and to attract foreign scholars, since the work around the database must have significant potential, as computational social science is in the ascendant. There is also an excellent record in contribution to the ‘third task’, i.e. active interaction with the society at large. This has been appropriately documented in the self-evaluation report.

Opportunities for renewal and emerging science
The earlier very successful economic geography research network, CIND, has by now ceased its externally funded activities. Its re-birth, possibly with a different name and slightly different focus, would help to continue with a critical mass in economic geography research. Active support from the IB group in the business studies department and from research partners in economic history should further strengthen the opportunities for creating a strong and multidisciplinary oriented ‘new’ CIND. Nevertheless, the key economic geography staff should be motivated to maintain its high research and publication profile. When the new research network is launched, it should be open to disciplines beyond economic geography in order to guarantee the necessary multi/transdisciplinary approaches.

One long-term issue is to consider the research renewal beyond the globally significant cluster themes that have been popular in economic geography in the past years. Active current postdocs can become important drivers of renewal
and development. It is also important to guarantee the broadening of the methodological development, for example, through a stronger emphasis on quantitative methods in order to balance the clear dominance of qualitative research within SEG. A more profound utilization of PLACE could here be a trigger for even more interesting and attractive international research output. There are also potentially interesting opportunities of cooperation between the creativity theme and colleagues dealing with art entrepreneurship in the business studies department.

As has been indicated above, a crucial moment is the retirement of one of the geography chairs in the near future. It is of utmost strategic importance how this position is filled: in which field and whether the candidate search is international. An additional professorship in economic or urban geography would deepen the focus in a field in which the department is already now very strong. However, this would leave the remaining research themes thinner. In fact, if the research themes 3–4 are to be promoted, then there is needed stronger academic leadership possibly through this new professorship. Despite this, the research themes 3–4 (with the exception of the urban social geography research by IBF) need to focus more on themes of international relevance.

The relocation of IBF to Uppsala opens possibilities for even deeper cooperation between the SEG, the IBF and other departments and their respective disciplines. A more sophisticated utilization of the internationally unique longitudinal georeferenced socio-economic and demographic database is an opportunity for internationally highly visible research with also strong potential for societal relevance. For this, also more sophisticated approaches are needed, especially quantitative methods and geoinformatics, as well as critical urban theories.

**Actions for successful development**

The department has taken clear action to improve the quality of research. This is done mainly through recruitment of early career and international staff and internationalization of research practices, for example, through publishing in peer-reviewed international journals. Some very promising (international) recruitments have been done. The career development of most active PhD students into postdoc positions has been promoted, and this action should be continued. In general, the PhD training activities have been outstanding, both quantitatively and qualitatively.

At the department, there has been a strategy of encouraging everyone to contribute to the research output. However, the individual staff members must fulfil this supportive opportunity, otherwise the department as a whole fails to upgrade its research performance. To avoid this, the more experienced staff should give advice and support in the publication practices for key international journals. Attention should be given to achieve more equal gender balance in different research fields and higher academic positions to evict the negative outcomes of presumed “glass-ceiling”.

**Part III: Panel Reports**

Panel 2
In addition, the department could benefit significantly from developing closer interactions with the Department of Informatics and Media, both in terms of research methods and research topics (such as shared interest in topics related to the implications of Information Technology for mobility).

Finally, we would repeat our recommendation that, if the department is indeed committed to the fourth research theme it has identified ("Mobility, Space, and Identity"), it demonstrate this commitment by appointing a permanent chairholder with a distinguished academic research track record in this field to take the responsibility for coordinating and enhancing the research activities within the theme.

**Effects of KoF07-evaluation**

A significant impact of the KoF07 is the increased attention to strengthening the internationalization of the research practices at the department. The recent recruitments have improved the international research profile as well as the progress of the then PhD students into current postdoc positions.

The research themes at the department have been reorganized. Now there are four comprehensive themes instead of the more traditional division between the human and economic geography sub-disciplines. The SEG appears in this respect to be following a ‘muddling-through’ approach, based on the concern not to ‘leave anybody behind’. The quality gap identified in KoF07 seems to have generated some discomfort among a few staff members, leading to the redefinition of research areas. Such a redefinition seems, however, to be chiefly envisaged as a strategy to respond to potential KoF11 challenges than a real reconfiguration of the department structure. This approach appears to have been relatively successful in fighting clear research ‘holes’ or ‘underperformers’, but not in ensuring clear synergies among relatively diverse research streams. Nevertheless, the gaps between outstanding performers and the rest of the team have so far not been overcome. Some under-publishing collaborators play, though, an important role in attracting funding as well as in taking the department’s flag at home or abroad. But besides sharing a common disciplinary history, the bridges binding them are not clear. KoF07 seems to have played a role in ‘shaking’ the department. However, a satisfactory solution has not been developed to solve the ‘chasm’ between the most productive staff members and the ‘others’ (which one may call socio-geographers).

There is a concern with ‘quality of life’ and inclusion in the department that prevails over the perception of international competitiveness. While the breaking up of sub-disciplinary borders is a welcomed action, the current division is not entirely clear and convincing. The themes 1 and 2 are in economic geography, one more on clusters and another more on sectors in cultural economies. Theme 3 is internally rather heterogeneous with the IBF group being the dominant part in terms of external funding and international recognition. Also the fourth group needs to identify one or two research fields which more clearly can motivate the new theme, and needs also a clearer academic research leader-
ship. On the whole, however, the panel finds that the department has taken a step forward in the direction of improving the general quality of research and by exploring new routes to renewal along with the ambitions of KoF07.

Department of Informatics and Media

The Department of Informatics and Media was formed in response to the KoF07 evaluation, and represents a new beginning for the study of individual, organisational and societal aspects of the current strong wave of digitalisation. It is constituted of three distinct research groups; Information Systems, Human–Computer Interaction, and Media and Communications. These groups hold significant potential for synergy and each displays very strong research achievements despite their brief history. The faculty contains 7 professors (3 chaired, 4 promoted); 5 senior lecturers/associate professors; 8 lecturers; 2 postdoctoral researchers; and 14 PhD students. The department is engaged in teaching 4 MSc programmes and a total of 580 “full time equivalent” students.

General assessment of the department

The KoF07 assessment led to the formation of the Department of Informatics and the Media, a decision that the current panel applauds. We are pleased to report that the new department has significant potential and that given appropriate support through the university and in the Faculty, the Department of Informatics and Media has great promise to become a world-leading centre within the next five years. To be brought to fruition, however, this will require additional investment, consolidation of all groups at a sustainable level, and continued effort to deliver high-quality research.

We particularly commend the goal of combining the three separate elements (information systems, human–computer interaction, and media and communication studies) as this has directly led to one department that takes significant novel and different perspectives on the shared phenomenon of digitization. It is especially impressive that the department is endeavouring to blend technical and social research without privileging one dimension – a vital if estimable challenge. This represents noticeable innovation of all three fields, and a promise of even further academic challenges to the prevailing perspectives.

KoF07 led to the recruitment of three chaired professors and the internal promotion of additional professors. This has already gone some way to establishing an outstanding department, despite two of the chaired professors having been in post for less than a year. These appointments are characterised as young scholars, with an already solidly established academic profile and career. The energy of these three scholars and their immediate colleagues was palpable as was their determination to establish a vigorous research culture. The panel saw
significant potential for great things to come, far beyond what already has been achieved given support and continued effort.

There is already evidence of strong academic leadership. It will be important to ensure that this continues and is consolidated so the department can achieve its potential. This will require additional academic and administrative resources. In addition the department must ensure to cultivate a wider based of excellent academic leadership beyond the present situation. Both the Human–Computer Interaction and the Media and Communications groups are presently below critical mass of tenured staff. This results in the professors having to spend disproportional time and energy on organisational and support activities, in particular on ensuring that the goal of raising the academic standard is followed through.

Quality of research
There is evidence of strong academic capacity among the professors, though currently these represent stars rather than larger constellations of strategically focused and highly research-active academics at several levels. It is the panel’s view that the three research groups are solidly placed at internationally high standard. This is a considerable achievement given the age profile and recent arrival of the three chaired and additionally promoted professors. There are compelling reasons to suggest that significant parts of the activities within this department could reach category 1 (top-quality) within the next five years. This will, however, require strong academic team-leadership and increased administrative support.

Information Systems Group. – Within the Information Systems group, we are particularly impressed by the accomplishments of the academic leadership. It embodied clarity of vision: “Think IS, think Uppsala”. The group already has a record of very high-level publications only matched within Swedish Information Systems research by one or two researchers. This is highly unusual within European Information Systems research. The panel was particularly impressed by publications in the full range of the top IS journals. The group leadership formulated bold strategic aims that in our view are well within reach. We note that the group constitutes a significant critical size in terms of tenured faculty, but with much potential to grow further as the department matures and consolidates its position. The group had a convincing series of ongoing and planned research projects. The panel noted that although pragmatic position might be a necessity to ensure project funding, it is necessary to continuously seek a focussed portfolio of projects supporting highly quality focussed research.

Final quality assessment: Internationally high standard.

Human–Computer Interaction Group. – The academic leadership for the Human–Computer Interaction group was only established late 2010 but already provides a highly exciting new direction for the department. The strategy and
clarity of vision formulated as part of the new recruitment were highly impressive to the panel. We found that the ability to formulate a comprehensive critique of the dominant approach to human–computer interaction persuasive and compelling. The work is theoretically persuasive and substantively of a very high order. The particular vision for engaging comprehensively with industry as a core element of addressing deeply theoretically challenging issues around digital materiality was highly commendable and entirely guided by a healthy combination of common sense and profound insight. The group convincingly managed to engage the panel in a substantial discussion of “post-representational interaction” and convinced us of the viability of the envisioned academic endeavour. The panel clearly notes the great potential for synergy in research and theory development between the HCI and the IS groups. The panel found in this group a clear and strong research focus.

Final quality assessment: Internationally high standard.

Media and Communications Group. – The Media and Communications group was also signified by the recent establishment of significant academic leadership that already has had a considerable impact on the research culture of the group. This leadership provides great encouragement for the application for research grants, and has already led to an impressive record of publications and international network of researchers. The group clearly demonstrated the dramatic increase in high-level academic publications since the beginning of 2010. They articulated a persuasive vision for future research in media and communications, with a focus on digitalization, which holds the promise of a distinctive and important Uppsala presence in this field.

We would encourage the department to establish an Uppsala Informatics Institute to help shape the direction of this endeavour. This should also link with Information Systems and HCI research. The Media and Communications Group’s work expresses a distinctive theoretical orientation with its emphasis on evidence, ethics and conceptualisation. There is much promise in this group but they have decided to prioritise a highly fluid area and will need to maintain concerted effort to maintain their lead. At present they group is below the critical mass of tenured staff and research students. The panel also notes that the group will need to ensure a continual alignment of the strategic research focus and the portfolio of research projects sought funded.

Final quality assessment: Internationally high standard.

It was very clear to the panel that across all three groups we felt a pleasingly high level of moral, determination, strong academic ambition, and sense of direction.

Research environment and infrastructure

The changes resulting from KoF07 have clearly led to a radically changed research environment with strong academic leadership and clear directions for
the department. However, it is also clear that the panel is not convinced that this has been followed by the appropriate supporting infrastructure. We identified a pressing need for administrative support, particularly for the management of research. The university has established several positions dedicated to supporting the identification of opportunities for EU research funding, but the university should also consider whether benefit would also be gained from dedicated administrative support for the operational aspects of research projects and grant administration across the Informatics and Media Department. The panel found the general physical environment and infrastructure satisfactory for the projected activities and did not register indicators of significant deficiencies.

The panel noted a call from research students for more formal guidance, for example in writing papers, publication, presenting at conferences, etc. One key element in this could be the research students across the three groups organising a series of events themselves, with appropriate support from academic staff. This would ensure that the activities undertaken would meet the demand of any current cohort of research students. A critical part of such undertaking will naturally be highly practical activities of writing, and reviewing workshops where faculty leads practical exercises in core academic activities. Such endeavour would not only reduce the learning curve for new entrants, it would also foster a common culture of the importance of academic professionalism, and hopefully also reducing any anxiety of doctoral students experiencing pressure to perform without any natural way of channelling this.

Networks and collaborations

We were impressed by the extensive national and international networks already established, both with industry and academic outlets and communities. Within the Information Systems group, it was refreshing to see very clear direction in the strategic collaboration around the doctoral education through collaboration with the business studies department on the Management and IT (MIT) doctoral school. The new group had clearly managed in a very short span of time to align itself with this important activity to the extent that the Information Systems group provides the directorship of the MIT Programme.

We found that the benchmarking institutions against which each of the three groups measured themselves were both appropriate and ambitious. We suggest that the department seeks to establish an Uppsala Informatics Institute to focus and coordinate these activities and to raise the international profile.

The Information Systems and HCI groups both do research with a commendable practical outlook leading to significant industry and public sector involvement. This is a conscious and fundamental choice, which we applaud, and not merely the result of pragmatic choice. This engagement exactly offers great potential for international recognition of research and for substantial re-invigoration of both the Information Systems and HCI fields.

Similarly, the panel found that the strategic choice of the Media and Communications group highly relevant and considered. Here, there may be possibili-
ties for collaboration with public and private institutions, but this does not carry the same significant necessity and neither does the lack of external involvement in any way reduce the impact of the research.

Opportunities for renewal and emerging science
We re-iterate how much we were impressed with the achievement and leadership of the three groups. They are already in the internationally high standard category with significant potential to reach the top-category within the next five years. However, it is imperative that the university retains these core staff. To this end additional resources in terms of staffing, research students and tenured faculty, will be required. New staffing should endeavour to attend to the issue of gender balance, which we note the present academic leaders are sensitive towards.

We found the clarity of vision highly commendable across the department and urge an ongoing focus on synergies across the groups without reducing the considerable academic ambitions within the three disciplines. It was evident that all three groups had discussed and formulated their collective vision through intensive discussions within and across the three groups, with evidence of particularly promising cohesion between the Informatics and the HCI groups.

Some panel members expressed anxiety that these dynamic academic leaders may suffer from over-stretch when attempting to balance their research ambitions with the everyday operational demands. They all appear to be firing on all cylinders across a wide range of activities, such as publishing, generating funds, editing journals, managing their group, supporting the upgrade of less research active staff, supervising students, teaching, and establishing international collaborations. We recommend that such staff receive appropriate mentoring from more experienced colleagues who may help them manage these daunting challenges.

Actions for successful development
The panel recognises the need for additional resources in the department. It is necessary to build the middle-level with new staff and improve the competencies of some existing staff. The panel clearly saw evidence of a small part of the non-professorial tenured staff doing very interesting work. However, there is a significant challenge in upgrading academic achievements amongst the group of less research active staff. Our expectation is that all faculty members should be engaged in research. Targets for research should be set and revisited in an annual appraisal system. Small amounts of internal funds may be made available to act as seedcorn for research. The panel was sceptical of claims that teaching loads were so onerous as to entirely prohibit unfunded research on a 100% post. Clearly such teaching responsibilities do not allow for comprehensive research activities, but the concentrated arrangement of teaching and a carefully planned individual set of targets can indeed be a valuable start on a re-energised research career. We recommend the department should work towards all academic staff
aiming at achieving a doctorate, or at least a Licentiate (MPhil), before the next KoF.

In order to achieve the attainment of a world-leading department, the panel recommends an additional investment of two new PhD studentships per year for next five years for the department and should in the short term seek additional two tenured academic staff to enhance the position of HCI and Media and Communications Studies. Administrative support is needed, especially for research bids and their management, for example by better utilisation of centrally employed project application staff, and by securing appropriate further support within the department for general project management and administration. It will be essential for all three groups within the department that extra care is put into organising teaching and administration so that sufficient time for research can be guaranteed.

We commend the links with the business studies department that have already been established and recommend that the department looks to make closer links with the Department of Social and Economic Geography.

Finally, the panel recommends that the HCI research at Uppsala University be consolidated at Department of Informatics and Media.

Effects of the KoF07-evaluation
KoF07 not only led to the creation of the Department of Informatics and Media as it is currently constituted; it also produced a commendable shift towards a social science orientation in the department. Moreover, it led to the appointment of assured and energetic new faculty. An impressive research culture has been nurtured at an impressive speed. The panel is convinced that, given the general academic and global directions within the study of the information society, the social science faculty is indeed not only an appropriate institutional home for this research, it also uniquely offers a strategic opportunity of the entire faculty of renewal and further global status.

The advantages of relocating cognate staff within the IT Department should be seriously considered. This panel has not assessed research within the IT Department, but the existence of two groups at Uppsala University studying Human–Computer Interaction was highlighted in KoF07 and this issue remains unresolved. The panel has read the two reports from the committee investigating the issue of integration between the two departments, and found that, especially within the area of HCI, there is significant potential for integration. The panel questions the assumption stated in the assessment of the HCI Division within the Information Technology Department that: “The faculty of social sciences has profiled its HCI group more towards social science.” As the panel saw the HCI research within Departments of Informatics and Media, there was a refreshing insistence on not basing research on this distinction (indeed in contesting it), thus defining the research in a very distinctive and contemporary manner.
Department of Business Studies

Introduction
With a tradition of business studies dating back to the eighteenth century, the Department of Business Studies at Uppsala University has, since its formal inception in 1958, built a strong reputation, particularly in the international and transnational aspects of business and organization. The university has chosen to organize the study of business in a department housed in the Faculty of Social Sciences, rather than resorting to the separate business school model that has been widely adopted elsewhere. One great advantage of this departmental structure is that, housed not only in the same faculty but also in the same building as other departments whose research is highly relevant to business, Business Studies researchers seem to find it easier to communicate and work with other disciplinary areas than do academics in most separate business schools.

Another advantage is that the department’s strong emphasis on publishing in English for an international audience includes a healthy encouragement of influential books produced by well-known international publishers. Finally, the department shares the commitment of the Faculty of Social Sciences to supporting a faculty that combines teaching and research activities, rather than establishing separate research centres. However, for the Department of Business Studies, the commitment to balancing teaching and research for its faculty has posed a difficult challenge, since it has a very large undergraduate programme, which provides 56% of its revenues but also places high teaching demands on the department.

In the wake of the KoF07 assessment, the department engaged in an initiative (“Smart Project”) to balance the time spent in teaching and research for faculty, the goal being two-thirds teaching time and one-third research. By cutting down on the number of courses offered (which reduced preparation and administration time) and by encouraging faculty to concentrate their teaching schedules to allow continuous periods of time for research, the department seems to have achieved this goal. This initiative also changed the way research funds were allocated, linking them to specific projects and research achievements instead of spreading them around the different sectors.

Research in the department is concentrated in five sectors, each led by a chaired professor: International Business, Marketing, Accounting, Management and Organization, and – the newest – Entrepreneurship. The department has articulated a strategic vision of simultaneously building deep expertise in each sector and fostering interactions across them, and has articulated a set of principles to guide both endeavours: a focus on high quality research, investments in long-term research efforts anchored in empirical analysis, and aspirations not only to build on but also to question and challenge the concepts and assumptions of the established literatures in each field. The department has identified the global transformation of business and societies as an overarching theme that provides a shared arena for cross-group collaboration and interaction.
The department has averaged SEK 23 million of research funding annually in 2007–2010. Government funding supplies 41%, through the Faculty of Social Sciences, and the rest comes from external grants. In addition to its 6 chaired professors (five sector Chairs, plus one who holds a Chair in Business Studies), the department has 2 full-time professors and 4 part-time professors. Since the KoF07 assessment, the department has expanded its middle and junior faculty, from 15 to 20 senior lecturers, from 28 to 31 lecturers with PhDs, and from 10 to 14 lecturers without PhDs. The department has 1,000 students in its undergraduate and Master programmes, and 47 PhD students. The department houses two research schools, Nord-IB, an network involving ten major centres of international business in Europe in a programme for doctoral students in International Business, and Management and IT, a Swedish national doctoral programme. In addition, the department anchors an innovative research network on multinational teams (“Leveraging Culture in Teams”) involving researchers from thirteen universities in Europe and Australia.

Following the model set by the KoF07 report, the structure of this report discusses each of the five sectors separately.

International Business Group

When the Department of Business Studies was first established in 1958, International Business was one of the areas targeted for development. The Uppsala IB group has a long-established reputation as a centre for innovative and influential research, especially research in the internationalization process of firms (a tradition of research widely known as the “Uppsala School”). At the time of the KoF07 report, the IB group had 14 researchers (3 chaired professors, 2 senior lecturers, 4 lecturers with PhDs, and 5 PhD students). Since then the group has expanded significantly, not at the senior level (which remains much the same with 2 chaired professors and 2 professors emeriti who remain active in research, publishing, and working with PhD students), but at the middle and junior levels. The group now has 6 senior lecturers, 5 researchers (2 of whom also work in the Entrepreneurship area), 1 international postdoctoral fellow, and 7 PhD students. In addition, the group has build a network of 5 researchers whose principal appointments are at other institutions but who are formally associated with the group and who regularly spend time in Uppsala and do research collaboratively with other members of the group. This gives a total of 24 people full-time in Uppsala and a total research group of 29.

General assessment of the unit

Since the KoF07 assessment, the IB group has broadened its research capabilities and both consolidated its already strong reputation and generated promising new research initiatives. Uppsala has been recognized as a major centre of research in International Business for over three decades, and the IB group has
continued to build upon and revitalize what has become known as the “Uppsala School” of research on the internationalization process of firms. The group is pursuing a coherent and promising research portfolio that combines critical and appreciative reflection on this tradition with new research initiatives into related but distinct international business phenomena. It has a strong research culture that is reinforced through extensive international networks of collaboration and interaction. It has increased significantly the production of research articles published in the top refereed journals in the IB field, and continued a longstanding tradition of the publication of influential books and edited volumes from leading international publishers.

Quality of research
The IB group has an impressive volume of publications in the leading International Business journals and in very influential and widely-cited edited volumes and books that has consolidated its reputation as one of the world’s top centres for research in International Business. The group has identified two main areas for research, and in each its researchers are pursuing both an established stream of research and a set of new and more innovative topics that are often collaboratively linked to other research groups.

The first area of research builds on the “Uppsala School” tradition of research on firm-level internationalization processes. Work is continuing on market entry and the creation of process and network models of internationalization, and a promising new project is being developed in cooperation with UNCTAD to look at the internationalization of state-owned enterprises from emerging market economies. In addition, two new but related topics have been identified: how opportunities for international expansion are created (an area of research with strong links to the Entrepreneurship group), and how established MNCs with extensive cross-border experience draw on their capabilities to further expand their activities internationally.

The second main area in which Uppsala has built a strong reputation since the early 1990s, managing the multinational corporation, continues the trajectory of research on HQ control, subsidiary influence, and innovation and knowledge transfer but adds several new topics, including the impact of MNCs on host countries in terms of learning and knowledge spillovers (with links to CIND and to work at the Manchester Business School), cross-cultural management, the role of headquarters in a complex MNC network, and the governance of Chinese and Russian firms (joint with Accounting). This research portfolio both builds on and significantly extends the traditional strengths of IB research at Uppsala. Moreover, the various research themes being pursued in the group have a coherence and potential synergy that is rooted in the strong research traditions of the “Uppsala School” and therefore are likely to reinforce external perceptions of an institutional research identity or “brand” (as opposed to one or more individual “stars”).

Since the previous KoF07 review, the group has significantly increased its
publication of articles in the leading refereed international business journals and has produced two widely-read books, and this trajectory of increasing research productivity is on track to continue.

Final quality assessment: Top-quality.

Research environment and infrastructure
The IB group has built a vital research culture which strongly encourages students and faculty to publish, and especially to target their research papers at leading journals. Its biweekly seminar series is widely attended and provides feedback on research papers from across the group. In addition, each of the research subgroups in IB has a budget to bring outside scholars in for seminars. It also appears to manage to allow its members to spend 35% of their time on research without attracting big research grants. Its extensive international research networks (discussed below) provide students and junior faculty with opportunities to experience other research environments and to build collaborative research networks beyond the Uppsala group.

One improvement in the research infrastructure might be to institute more regular and formal individual reviews (perhaps on an annual basis) for PhD students and junior researchers. This would provide an opportunity for routinised feedback and for setting clear expectations and targets that would enhance the research culture of the group.

Networks and collaborations
The IB group has built and maintained an admirable range of external networks. Perhaps the most influential is Nord-IB, a joint project of six Nordic Universities and two U.K. schools which provides a set of three-day intensive PhD modules in International Business over an eighteen-month period. Although preference is given to students from the sponsoring institutions, it is open to students from other institutions. With an enrolment of 30, it provides students with an international network with other students and with faculty from other institutions as well as an excellent grounding in IB research. It is administered by Uppsala’s IB group.

A newer and even more innovative initiative is the research network called “Leveraging culture in teams” also hosted by Uppsala University’s IB group. This will enable the IB group to develop a reputation very quickly in this very important research area, one that is relatively new to Uppsala but complements its current research portfolio extremely well. This network provides a model that might well be followed by other groups. The network’s members are dispersed across 13 universities in Europe and Australia, and aims to initiate new research collaborations among its members and to provide support and feedback for writing up research in this area.

In addition, the IB group builds its international networks by hosting visitors from abroad who visit repeatedly for varying (but short) periods of time, and whose collaboration with the IB group’s researchers is evident in the pub-
lication portfolio. Currently there are five “regular visitors” who are funded through the Science Council. The IB group also invites leading scholars for short visits, and seems to be increasingly strategic about selecting these visitors: for example, two leading experts in qualitative research methods have been invited recently in response to an increasing number of qualitative research projects being undertaken by PhD students and IB researchers. Uppsala’s status as a leading centre of IB research makes it an attractive institution for top scholars in the field.

The group has been able to attract PhD students from a variety of countries, including China, who are capable researchers and can contribute to the internationalization of the PhD student body and the foreign-language research capabilities of the group. It also actively cultivates opportunities for its PhD students to spend significant periods of time at other institutions, particularly though far from exclusively those in the Nord-IB network.

Within the Department of Business Studies, the IB group has developed close research relationships with Entrepreneurship and with Marketing, and is currently building research links with Accounting. The relationship with Entrepreneurship is especially strong, and benefits both groups. Interaction with the Management and Organization, in contrast, has been less developed, even though institutional theory has over the past decade become an extremely influential paradigm in IB in general and the department’s Management and Organization group contains an outstanding group of institutional researchers. The proposed research on the internationalization of state-owned companies from emerging market economies might be an area where cooperation could benefit both groups.

**Opportunities for renewal and emerging science**

We see no reason for the IB group to change its current strategies and research agendas, but we do suggest three opportunities for renewal that the IB group might choose to pursue. One is building on the past link with CIND. The IB group’s research on how MNCs affect local business environments has had a longstanding and fruitful relationship with CIND in the Department of Social and Economic Geography, and might play a helpful role in developing further research when the CIND funding terminates, to the mutual benefit of both IB and the department.

A second opportunity might be to incorporate the digitization of global business into the research agenda; we would expect it to have a significant impact on IB research issues as the role of Headquarters in a complex MNC network, and on the internationalization processes of the state-owned enterprises from emerging markets that are embarking on international expansion in the era of digital media.

The third opportunity might be to leverage even further the collaborative research networks made possible by the Nord-IB network, whose increasing focus in recent years on PhD education seems to have somewhat detracted from
its initial dual agenda of education and the enhancement of research collaborations among faculty.

Actions for successful development
The KoF07 panel recommended that the IB pursue closer relationships in research with other groups in the Department of Business Studies, particularly the Management and Organization group. We commend the IB group for pursuing strong internal networks, especially with Entrepreneurship, but suggest that a closer link with Management and Organization in the research on the internationalization of State-Owned Enterprises in emerging market economies would not only enhance the Uppsala School tradition of research on the internationalization process but also fist into the department’s wider agenda of research on Global Transformation, by drawing on Organization Theory. The Management and Organizations group can be a resource for articulating how the local institutional environments of these firms on the one hand and the dynamics of transnational governance and reputation on the other influence not only the processes by which these firms internationalize but also their potential impact on the internationalization strategies of established MNCs and newly internationalizing firms from the developed economies.

We commend the IB group’s stated goal of continuing to reflect critically upon the continuing relevance of the established concepts and paradigms of the “Uppsala School”, including the network approach to the MNC. This has led the group to develop new research projects that advance its distinctive profile in IB research.

Effects of the KoF07-evaluation
The KoF07 panel recognized the IB group as having achieved a high profile within the global International Business research community, and as effectively pursuing renewal through its research on the changing phenomena of international business. It also made several recommendations to the IB group concerning the revitalization of its research agenda, some of which the IB group has followed, particularly developing data-bases on the companies of emerging economies. However, on the whole, the group has followed its own path to renewal, with very satisfactory results. It has expanded the core group of researchers and built a vital and broad-based research group, with a high level of energy and ambition. It has built upon the traditions of the “Uppsala School” in IB, but is doing so with an effective blend of pride in the tradition and critical reflection upon it.
Marketing Group

The Marketing Group is housed within the Department of Business Studies. Its research foundation dates from the 1960s and encompasses both the study of internationalization of the firm (initially Swedish firms, but later multinational firms in general) and the application of network and relationship methodologies to improve understanding of business-to-business organizational relationships. Indeed the Marketing Group was one of the founding institutions to the Industrial Marketing and Purchasing Group (IMP) approach and this formed the basis of a stream of research publications that placed the Marketing Group as a consistently high standard of internationally recognized work very close to world leadership in the field.

The group is comprised of three full-time professors, five senior lecturers (docent), five lecturers (three with PhD) and seventeen doctoral students. It has been very successful in obtaining external research funding, which, when combined with a significant number of active researchers, provides a platform for success in high impact research publications. Following KoF07 the group made a strategic decision to diverge from the dominant IMP research focus of the previous three decades to encompass more traditional research areas of consumer marketing, services marketing and international marketing.

General assessment of the unit

The KoF11 panel was pleased to note the significant funding for research in the Marketing Group. The recent SEK 4.2 million grant by the Bank of Sweden Tercentenary Foundation, a series of large grants by other foundations and external funding sources, is indicative of the recognized stature of the group’s previous research accomplishments and its potential for maintaining a high level of quality research. Group leadership by the chair and senior professors has led by demonstration with several quality publications in refereed journals and significant research books, especially in international marketing. The group has made significant efforts to move past the focus on the IMP approach to the field, and to broaden its research arena.

However, it was felt that the diversity of research directions undertaken since KoF07 has limited the Group’s ability to achieve and maintain a recognized level of internationally recognized high standard of research output. While the numerous (funded) research projects have resulted in many conference proceedings, the panel was disappointed by the inability to bring these preliminary research publications to a higher level required for publication in top journals. While there was some limited success in doing this, given the size of the group and the high level of research support, clearly many more conference papers should have been improved for submission and publication in top-tier journals. It seemed to the panel that the group lacked the level of energy evident in the other groups reviewed. Whether this is because the efforts of the individuals are too widely distributed across topics or because the group has
not yet developed a collective identity was not clear to us. Developing strategic focus and a shared identity that can provide a more energizing and supportive research environment can and probably should be a shared effort rather than a vision imposed by a single leader. We believe the group requires stronger and more distributed leadership to achieve a more productive research focus.

Quality of research
At the time of the KoF07 review, the marketing group was evaluated at the second highest level of research output. This appears to be largely due to the extremely high profile of the former chair of the group, a leading founder of the Industrial Marketing and Purchasing (IMP) paradigm, and several members of the group that were extremely active and productive researchers within this paradigm. When this chair left for a different university, the group and its new chair sought to broaden the scope of research that the narrow IMP group had imposed on the group’s research efforts. New researchers were successfully recruited in the areas of international marketing, consumer behaviour and services marketing – traditionally the main areas of marketing research at universities throughout the world. We found that while this is a commendable strategy, the group has yet to establish a significant footprint in any of these research foci. This may be due to the fact that collectively these three research areas within the global academic marketing community comprise multiple numbers of researchers compared to the more targeted industrial marketing arena. It is far easier to stand out within a smaller research community than to do so in a community that encompasses almost all academic researchers in marketing.

The necessary efforts of the group to shift its research portfolio away from its virtually exclusive focus on the relatively mature IMP paradigm, however, have put it into what can be seen as a transition state, in which the group is struggling to articulate a focused research strategy that will re-establish its reputation. Since the KoF07 review, the Marketing Group has published 17 articles in refereed journals. Of these, seven were in highly rated journals. Given the size of the Marketing Group, the panel felt that this was a weakness. The ten articles in lower impact journals and the high number of conference proceedings (49) seem to be consuming significant energies of members of the Marketing Group.

At this juncture the KoF11 panel feels that the lack of focus for the group’s research has lead to a weaker evaluation than in the previous assessment. To reverse this trend the group needs better focus for its research and more ambition to attain higher quality goals. The basis for a successful transition is being laid, but the process is still incomplete.

Final quality assessment: Internationally recognized standard.

Research environment and infrastructure
The Marketing Group has sufficient numbers of researchers (3 professors, 5
senior lecturers, 5 lecturers, and 17 PhD students) to generate and sustain a significant stream of research. We were pleased to see the recent addition of the third professor reinforce the university’s commitment to the group. We also found the institutionalized bi-weekly research seminar and weekly department discussions to be a commendable means of maintaining an emphasis in research. We suggest that some of these sessions, perhaps on a quarterly basis, be specifically devoted to discussion of specific strategies to foster sustained research streams of high interest to the broader marketing community.

It would benefit the Marketing Group to develop a more systematic approach to improving the research writing skills of PhD students and more junior faculty. Additionally, several of the PhD students expressed the need for a more formal mentoring process to inculcate new students to the specifics of the Uppsala research environment and to provide a sounding board for individual concerns and uncertainties.

Networks and collaborations
The panel was impressed with the degree of collaboration between members of the Marketing Group and other areas within the department such as international business and management and organization. These seemed to be rather well structured and reinforced by department-wide research seminars that exposed members of the entire department to each other’s research efforts. While there was some evidence of collaborations between members of the marketing group and researchers at other institutions, this seemed to be derived from individual relationships of the group’s faculty; it did not seem to be strengthened by specific actions or efforts from the group itself.

As a result of its excellent relationships with the IMP group (a global network of researchers investigating the development of interfirm relationships networks and alliances among business organizations), the Marketing Group hosted the 2008 IMP conference. Several of the faculty have been active members of IMP and have had jointly authored publications with IMP members; the panel encourages more of these joint research projects to restore the level of world-class publications evidenced in the past.

We also encourage the Marketing Group to develop and undertake joint research with other research groups existing in the services marketing as well as in the area of international marketing, particularly research groups focusing on less developed economies or the BICKS (Brazil, India, China, Korea and South Africa).

Opportunities for renewal and emerging science
The KoF11 panel saw several cases where small amounts of resources have yielded significant publication results. One mechanism that has encouraged this has been the flexibility allowed by faculty to concentrate their teaching duties into relatively short duration blocks of time (e.g., over three to four months) thereby permitting extensive blocks of time for intensive research efforts. These
blocks of time can be used for research at Uppsala or they may enable the specific researcher to travel to other universities for collaborative efforts with other marketing researchers.

A long tradition of marketing research has lead to significant databases that can be used by researchers. Building on these existing databases is a very cost effective means of generating research papers and reports that can be of significant interest to the broader research community. The panel encourages the Marketing Group to continue these types of activities.

The review panel also thinks that the Marketing Group needs a specific strategy to convert conference papers to high quality required for major marketing and related journals. For example, researchers who present papers at conferences could discuss the feedback obtained from the conference at the bi-weekly research seminars currently held within the department. The group should also establish annual and five-year objectives for the number of articles published in top tier journals.

While there was one member of the Group working on digital games, the panel noted that there was no ongoing research in the area of digital marketing. Exploring this rapidly growing area of research may lead to collaborative research with researchers in the informatics and media department.

Finally, the KoF11 review panel recommends that the Marketing Group establish a more collaborative research strategy, possibly based on a matrix approach, for the identification of research opportunities with higher potential for collaborative research both within group members as well as between group members and marketing researchers at other institutions. For example, rather than the generic research areas of international, consumer and industrial markets or focusing on services, products or solutions (projects), it may be more productive to approach this as intersections of these areas such as an investigation of structural or decision factors that impact development of international industrial services or the impact of digital marketing on the diffusion of innovative products across global consumer markets, to name but two possibilities.

This approach may facilitate collaborative projects with other groups within the department (such as international business, management and organization or entrepreneurial studies) or within the School (such as Informatics or the innovation, industry and regional change research group within the Department of Social and Economic Geography).

### Actions for successful development

The KoF11 panel has identified several specific actions that should be considered to improve the overall productivity and impact of the group’s research activities. Most important is that the areas for research which the group presented to the panel – consumer markets, international marketing and services marketing – are too broad to provide an opportunity to achieve leadership positions given the current size of the group. Departments with 40 to 50 faculty members (full professors and senior lectures) each with one to six PhD students may
strive for global recognition on such a broad research basis; a group comprised of three professors and five senior lecturers is simply too small to achieve such recognition. We recommend that the Marketing Group collectively develop a more focused research strategy.

One specific research area, derived from the IMP research stream, is the study of the termination of business projects. We found the publication of a book discussing this research stream was an excellent means of attaining broad international recognition. We suggest that this research stream might be expanded to encompass overall project management as well as general relationship terminations.

The current research foci seem centered on the dominant teaching responsibilities of the group. The review panel recommends that the Marketing Group develop greater strategic clarity of conceptual anchoring of their research agenda. It is felt that this will provide better direction for research and restore research energies among researchers in the group.

**Effects of the KoF07-evaluation**

The KoF07 review contained two specific recommendations for the Marketing group. The first recommendation was for the new IMP researchers to continue to extend the IMP methodology along an incremental path; the second was for the science and technology studies area to continue applying network analysis to the adoption of new technologies into new markets.

The KoF11 panel found that the marketing group has deviated significantly from both of these recommendations. The KoF11 panel could not identify any research directed at the application of network analysis to the adoption and usage of new technologies in new markets. The review panel could not determine why this has occurred; indeed, not one person in the Marketing Group even mentioned this recommendation of KoF07.

**Accounting Group**

The Accounting Group is comprised of one Chaired professor, one part-time (20%) visiting professor, three senior lecturers, and twenty-one lecturers (including three part-time guest lecturers) to supervise 17 doctoral students as well as coping with a heavy load of teaching. After a three-year hiatus owing to the untimely death of the previous Chair-holder in 2007, the Accounting Chair was finally filled in 2010. Building upon a long tradition of research into the design, production and use of accounting information systems based on empirical methodologies, the group conducts research in both profit- and not-for-profit companies and organizations. Members of the group maintain an open mind towards a wide range of theoretical approaches and this has led to research utilizing theories and methodologies from the fields of economics, sociology and psychology. Several recent research projects have been informed by inter-
organizational theory (especially network theory), structuration theory, and actor-network theory.

General assessment of the unit
The KoF11 panel views the Accounting Group as a dynamic and extremely promising unit within the Department of Business Studies. While it is a relatively newly reconstituted group with a new focus on research in a field that has long been focused on teaching, we felt that the high energy level of the group, its commitment to high quality and significant research programs, and competent leadership will very likely vault the group to a significant level of research recognition in a short period of time. Its size (it is now one of the largest research-oriented Accounting groups in Sweden) and its rapidly growing research profile make it easier to recruit and retain good people in a field where retention of excellent researchers has been a ubiquitous challenge. Its developing research portfolio has strong links with other groups in the Department of Business Studies and beyond.

Quality of research
Given the relatively new appointment of the chair and the recent addition of research oriented staff to the Accounting Group, and the panel’s own lack of expertise in the Accounting field (owing to the last-minute unavailability of the eighth member of our panel), we struggled to make a fair evaluation of the group’s research output. Since the KoF07 assessment, the publishing activities of the group have changed dramatically, both in venue (from textbooks to research-based articles in refereed journals and academic books) and in quantity. The group is now also represented in articles in prestigious refereed general management journals as well as in the more specialized accounting journals.

There was considerable debate among panel members between assigning a grade of Internationally high standard (excellent work, next to world-leading level) or Internationally recognized (very good work, attracting international interest) to this group. Clearly the group is building the base for a very strong research group; however, it has not had sufficient time or personnel to expand individual International high standard research to a similar level across a larger number of members of the group. The panel feels confident that the group has the willingness, leadership and capability to achieve significant international recognition in the foreseeable future. It should be pointed out that both the quantity and types of research outputs have moved in the proper direction to achieve these results.

Final quality assessment: Internationally recognized standard.

Research environment and infrastructure
The Accounting Group has identified two major areas of expertise on which to draw in its research: financial accounting and auditing, and a long-established tradition in the study of management control and information systems. The
group is pursuing research projects under both these general categories, and in the latter area has embarked on a closer collaboration with the MIT (Management and IT) research school hosted at Uppsala, which is of great benefit to its PhD students. The KoF11 panel feels that the group is identifying research topics of high interest and importance to the field of accounting, which should yield high quality papers in top journals.

There is general agreement that the environment of the group has changed dramatically since the KoF07 assessment highlighted the challenges the group faced in generating a vigorous research environment in what was still a teaching-focused group, although the previous panel noted that the signs of improvement were visible, as a research-oriented Chair had just been appointed. His untimely death shortly after the 2007 assessment was a blow to this process. Credit is due to the much-appreciated efforts of the part-time professor who provided leadership for the group in the long interval before a new Chair was appointed in 2010, but clearly the group has been galvanized by the arrival of the current Chair. This group now shares the positive environment for research characteristic of the Department of Business Studies as a whole, and has greatly benefited both from the recent appointments of three lecturers with 50% of their time devoted to research, and by the influx of a large group of capable PhD students.

Networks and collaborations
In a relatively short time the Accounting Group has been able to forge collaborative relationships with, for example, Stockholm University and has also developed excellent networks with people in the auditing industry. Both of these types – academic and industry – will be necessary to successfully exploit the group’s research potential. They have also developed collaborative projects with colleagues in a range of fields: critical organization behavior, social medicine (for a study of management control and stress), and in IS (the current Chair was formerly a Professor of Economic Information Systems). Given the necessity of modern information systems utilized by corporate accounting and auditing functions, the excellent collaborative relationship with the information area within the Department of Informatics and Media that is developing is of very significant importance to the group. Indeed, the group’s willingness to reach out to other disciplines and fields for research collaboration should contribute to an innovative approach to research in the accounting field.

One area where the panel felt additional efforts regarding collaborations could be applied is the development of more international networks.

Opportunities for renewal and emerging science
The Accounting Group has attracted a significant number of young researchers in a short time; to prepare these people for research productivity, we suggest that a formal mentoring program pairing established researchers with new doctoral students be implemented.
The group is actively seeking external research funding, and has a major proposal in the second phase of review with the Bank of Sweden Tercentenary Foundation, focusing on the production of “faithful financial reports”, an area of growing interest in Europe. This proposal involves international collaboration and a reference group of experienced practitioners, and could provide a strong vehicle for innovative research.

**Actions for successful development**

The Accounting Group is on an excellent track, and the KoF11 panel urges them to maintain their existing efforts. The Group’s existing linkages with Informatics and International Business should open new research and publication avenues.

The group has a number of researchers interested in bringing behavioural science into accounting research. This is a growing area in the accounting field generally, and we encourage the group to undertake the development of a stronger international network with researchers in behavioral accounting.

**Effects of the KoF07-evaluation**

As a relatively new research group at the time of KoF07, the Accounting and Finance Group had yet to establish a solid research profile. In their presentation to our panel, the group put up a direct quotation from the KoF07 report: “The pressing challenge for A&F is to shift from a teaching-centric grouping to one that is more research-focused. Recruitment of active researchers, and/or recruits with a strong research potential, will be critical. This will not be easy as accounting is a notoriously difficult area in which to recruit and retain research-oriented staff.” The group used this quotation as the anchor for their presentation to the current panel, demonstrating how far they had advanced since the KoF07 report, which obviously continued to be a touchstone for the development of the group.

Following KoF07, the group decided to focus on accounting. Group leadership has fostered an excellent research capability with doctoral students, and the group has great confidence in its leadership; the chair has maintained very inclusive relationships with all staff. The KoF11 panel was extremely impressed with the group's high determination to continue and accelerate the shift from a teaching to a research focus; given the addition of a significant number of research oriented personnel, the Accounting Group has now reached critical mass.

**Management and Organization Group**

The Management and Organization sector has a research group of 25. The KoF07 panel noted that the Management and Organization group had a long tradition of research at Uppsala grounded in the pioneering work of Sune Carl-
son and Lars Engwall, but that it was beginning to change its model from one focused on the “lone scholar” to one anchored in a broader research group. Since the KoF07 assessment, the group has been greatly strengthened, from one to six senior lecturers with PhDs (docents), six assistant professors with doctorates (a rank absent in 2007), and from three to eight PhD students. In addition, the two Professors are supported at the senior level by two eminent visiting professors and a very active professor emeritus.

**General assessment of the unit**
The group now has a critical mass of mid-level and younger researchers, virtually all of whom are actively engaged in research and publication, and has clearly been successful in building a coherent group of deeply engaged scholars developing a collective, not just an individual, reputation (the KoF11 touchstone for the research evaluation). Its plans to launch a European research training network in management and organizations, building on the model of Nord-IB, will greatly enhance its reputation and build valuable networks for its younger researchers.

The group focuses its research on four areas: governance, media and reputation, institutions, organizations, and professions, and public sector organizations. In all four of these areas, the group has publications in the leading academic journals, and it is producing internationally high standard research, with the high probability of reaching the very top reputation level within five years.

**Quality of research**
The group has had a strong reputation for many years, and in the past decade has become well known as a centre for organizational institutionalism. It is one of many such centres in the world, as the new institutionalism has become the dominant paradigm in organization theory, and therefore, despite the excellent quality of the research and the productivity of the group, it is difficult to argue that it deserves a top-quality ranking on the mandated scale. However, it unquestionably deserves a second-best rating (“Internationally high standard, next to world-leading level”), with the likelihood of to reaching the top level in terms of reputation within five years.

**Final quality assessment:** Internationally high standard.

**Research environment and infrastructure**
The group has fostered an impressive environment for research, and has developed a critical mass of mid-level and younger researchers. Virtually all of the senior lecturers and assistant professors are actively involved in research and publication in highly respected international journals. One factor contributing to this activity seems to be the workload balance: the group reported its average work load for young faculty as roughly half research and half teaching, and the group has a strong and active group of younger researchers who have clearly benefited by this, as demonstrated by their productivity in publishing. The regu-
lar presence of two eminent Visiting Professors who spend three weeks each year in the group is another factor contributing to the research environment.

**Networks and collaboration**

The group has developed extensive research networks in Europe and North America, and has fostered this through its systematic use of visiting professorships (an initiative recommended by the previous KoF07 panel and followed with great success by the group). One of the two regular visitors is from Canada and is the incoming editor of one of the top journals in the field of management and organization, the *Academy of Management Review*. The other is based in Europe: an eminent scholar in organization theory from ESSEC. The list of collaborations on publications for this group spans Europe and North America.

The group also has good collaborative networks within Uppsala University, with the Departments of Education, Sociology, Public Health and Caring Sciences, and Government. The one area where we suggest the group build collaborative networks is with the International Business group. It is somewhat surprising to us that, although institutional theory has become an increasingly influential paradigm in the International Business field today, the IB group has so little sustained interaction with such a strong institutional theory group that is literally next door and which has a deep interest in phenomenon related to globalization and cross-border interactions.

We commend the group for its stated intention to build a European collaborative research network in Management and Organization inspired by and at least partly modeled on Nord-IB. The group has identified six European universities who would make excellent partners in this initiative for collaborative doctoral training, and the strong reputation of this Uppsala group would certainly make it a strong advocate and centre for such a network.

**Opportunities for renewal and emerging science**

We are optimistic about the group’s prospects for renewal and the development of new research initiatives. The group is to be commended for striving for renewal by bringing in a critical perspective on the paradigm, the “new” institutional theory, that has dominated its work (with enormous success) over the past decade, with a call for renewed attention to the organizational level, as opposed to the environmental context that has been the focus of the new institutionalism. The recent research on media and reputation, using an institutional theory perspective, has been an enormously successful initiative, resulting in publications in the top-tier journals in strategy as well as in organization theory, and the business world will probably continue to provide an all-too-salient environment for such research. This was also the only group within the Department of Business Studies that made Corporate Social Responsibility, a growing concern around the world, a major research theme, and the group is to be commended for addressing this issue.
We would also like to commend this group for publishing very influential books as well as the refereed journal articles that are the focus (sometimes too exclusively) of most business schools, a practice it shares with the IB group. Perhaps the fact that these two research groups are housed in a Department of Business Studies within a Faculty of Social Sciences helps to maintain this value on book publication. Books are much more likely than refereed journal articles to reach across disciplinary boundaries and to exert an influence on a multiple communities of researchers, and the reputation of the Management and Organization group has been greatly enhanced by its production of influential books, and we recommend the continuance of this practice.

We would also encourage this group to develop closer relations with the International Business group, which shares its interests in the processes and effects of globalization and also works at the levels of organizations and environments. Some of the IB group’s emerging research initiatives could benefit greatly from the theoretical perspectives and insights of the Management and Organizations group, and the IB’s groups data bases and case studies and its identification of key management challenges could provide valuable ground for collaboration across the groups.

**Actions for successful development**

We recommend that the group pursue more actively short-term (i.e. three year) research grants, to provide more research funding for junior researchers. In addition, postdoctoral positions would also add greatly to the research activity in the group. The growing reputation of the Management and Organization group world-wide would make this an attractive place for new PhDs from a wide range of countries in a variety of fields that draw on Organization Theory (such as Strategy, International Business, Sociology, and Political Science) to spend three years with the group. Such positions could be developed jointly with other groups within the Department of Business Studies, particularly with International Business, and even with other departments in the Faculty of Social Sciences, and these postdoctoral researchers would thereby build bridges across the groups.

In the current era of austerity in North American universities in particular, where many extremely capable new PhDs are finding it formidably difficult to obtain tenure-track positions directly out of their doctoral programmes, there is a very attractive opportunity for building a cadre of highly capable postdoctoral researchers who would not only add to the research productivity of the group during their stay in Uppsala but would also remain part of the extended research network of the group after their departure.

The same problem noted for several groups and departments by the KoF07 panel concerning the absence of an orderly promotion and career progression for productive junior scholars remains an issue for this (as for other) groups, and we encourage the group to develop greater clarity around these processes and to ensure that junior researchers are receiving adequate career guidance.
also encourage the university to expand the potential for productive younger researchers to be promoted.

Finally, we strongly commend the group’s intention of developing a European collaborative research training network for doctoral students, on the model of Nord-IB, with a strong emphasis on leveraging it to enhance research collaboration among the partners in the initiative. This will strengthen the PhD programme in the group and expand even further the research opportunities for younger researchers in the group.

**Effects of the KoF07-evaluation**

The most evident impact of the KoF07 is the Management and Organization group’s response to the panel’s first recommendation that it ”attract prestigious visitors to the group…[for] a long visit or a series of visits over an extended period” to work with its researchers. This it has done by creating two Visiting Professor positions for two eminent Organization Theory scholars who spend 3 weeks a year with the group, split into one autumn and one spring term visit. We commend the group for this initiative, the most systematic approach to gaining value from visitors that we saw within the Department of Business Studies and indeed in the three departments we assessed, and it is an action that we would recommend to other groups and departments.

Another recommendation may have had unintended negative consequences. The previous panel recommended that the group apply for major, longer-term research grants that would enable continuity of employment for researchers. This recommendation was not followed, at least not successfully, and in its presentation to this panel, the group raised the issue of its lack of long-term grants as a major challenge for the group. The recommendation itself perhaps had the unfortunate consequence of focusing the group on long-term grants, which in this field have become extremely difficult to find, rather than the shorter-term (three-year) and smaller grants that this panel recommends that the group pursue.

**Entrepreneurship Group**

The Entrepreneurship Group was established in 2005 as a result of a donation by Anders Wall, a very well-know Swedish entrepreneur, with ten years of funding. Since its inception, the group has carried out both research and educational activities, responding to the demand for teaching in this field. Besides the PhD course, a training course in ‘Entrepreneurship, Business and Natural Sciences’ was launched, giving rise, in 2010, to two courses, one on ‘Entrepreneurship in Natural Sciences’ and another on ‘Entrepreneurship, Art and History’. In 2007, at the time of the KoF07 assessment, the group had only one professor, the Chair, and three doctoral students. Two of those students have now become assistant professors, and the group has grown to 7 faculty
members (the Chair, three assistant professors, and three associate researchers), including three women, and one doctoral student. With the impending recruitment of a new associate professor, the group is expected to reach 8 people by the end of 2011.

**General assessment of the unit**

The atmosphere appears to be very enterprising, reflecting a strong commitment to explore new research topics in the field, and the members of the group have embraced entrepreneurship not only as a focus for research but also as a means of group functioning. The vision for the group is “to explore the unexplored and develop creative and path-breaking approaches to the study of entrepreneurship”, thereby corresponding to a very broad delimitation of the research field. Entrepreneurship has been an expanding field of teaching and research over the past two decades, and it is not easy for a small group to build a distinctive research profile. However, this group is doing so, by differentiating its key areas of expertise from the more common focus on the creation of new firms in high-technology industries and focusing instead on two areas: entrepreneurship in established corporations, which builds upon the Chair’s experience in innovation in MNCs, and cultural entrepreneurship. The main research outputs so far concern opportunity recognition, the theory of the firm, subsidiary technology evolution, corporate intrapreneurship (especially in MNCs), and art entrepreneurship.

The research areas explored by the group have synergies with the International Business group and the Social and Economic Geography Department. However, the first are, so far, much stronger than the latter, partly because the Chair and two of the researchers, whose work includes research on intrapreneurship in MNCs, are also closely associated with the IB group. The panel considers that the Entrepreneurship group, in spite of not yet having reached the critical size necessary to realize its ambitious goals, has a very significant potential and may well in a few years time prove a very relevant contributor towards the renewal of the research output of the Department of Business Studies.

**Quality of research**

The KoF07 panel chose not to rate the Entrepreneurship group since it was considered that more time would be needed to appraise the results achieved by the research group, and our panel contemplated doing the same. We decided, however, that, while it is still very early in the group’s development, it is possible to provide an assessment in this report. The Chair already has a significant track record and international reputation, and follows a strategy of a limited number of very high research impact publications that have begun to establish a distinctive approach to entrepreneurship. Moreover, the group has defined a clear and differentiating set of topics for research. On the basis of this, as well as on the vision guiding the collective work, the inspirational leadership and the quality of the junior researchers, we believe that the group has the potential to
make a very significant international impact in the foreseeable future, although so far only the promising initial groundwork has been made. Final quality assessment: Internationally recognized standard.

Research environment and infrastructure
The group benefits from the good research environment and infrastructure available at the Department of Business Studies as a whole. In this case there are, however, two additional positive features. First, the existence of long-term funding makes research activities less dependent on relatively shorter term project funding. The second regards the existence of a nurturing environment, which makes junior people eager to contribute towards the success of the endeavour.

Networks and collaborations
The group benefits from the research networks established by the Chair at national and international levels. Interesting relationships were also established with industry. Given the early stage of this group, the panel considers that the prospects for developing further relationships with the industry are promising. These might also be stimulated by the education activities carried out. Within Uppsala University there are close links with the International Business group. Interactions with the Social and Economic Geography Department have taken place, although they have not been so far materialized in common projects, in spite of the potential synergies identified from both sides.

Opportunities for renewal and emerging science
Since the Entrepreneurship group is very recent, the main challenges faced deal with consolidation, and not so much with renewal. At present, the key challenge is to develop a consistent and committed team to pursue the vision of “exploring the unexplored”. The panel was impressed with the opportunity the group is pursuing to work with Ernst & Young in developing a “Global Intrapreneurship” award analogous to the well-known “Global Entrepreneurship” award. This might be used as an instrument to enable to develop case-based research and even, at a later stage, a data base.

Actions for successful development
As mentioned above, the research prospects are very positive. There is strong commitment to make things happen and to explore research opportunities in connection with the group’s two main areas of scientific expertise: entrepreneurship in established corporations and cultural entrepreneurship. While there is a challenging and committed atmosphere, an appropriate balance needs to be crafted between ambitions and operational capacity. In this regard, the panel considers that administrative support, especially for the new Masters Programme in Entrepreneurship, is needed.

The internship proposed for this programme, while clearly very valuable in
terms of both education and research, can be very time-consuming. In particular, it might become costly to the research programme if the burden of arranging and tracking such internships falls on the shoulders of the faculty members and researchers. It is also suggested that it would be appropriate to develop a strategy for profiting from the new educational programmes to leverage research: for example, using the internships to develop a data-base on entrepreneurial companies, and cultivating networks with graduates and internship companies for research purposes.

The expansion of the doctoral programme beyond the single PhD student currently enrolled at present might be important to achieve a critical mass for research. A last issue that might be considered by the group concerns the development of internal linkages not just with the social and economic geography researchers mentioned above, but also with law departments regarding intellectual property rights.

Effects of the KoF07-evaluation
The KoF07 panel raised some concerns about the small size of the group (the Chair plus three doctoral students), and recommended expanding the size of the group, but expressed approval of its general direction. Since the KoF07 evaluation, the group has grown to 8 people, with plans for the appointment of an additional associate professor, suggesting that the Department of Business Studies took seriously the recommendation of the previous panel to invest resources in this group.
Panel 3

Scope of the panel's evaluation:
Department of Curriculum Studies
Department of Education
Department of Studies in Education, Culture and Media
Department of Sociology
Department of Food, Nutrition and Dietetics
Physics Education Research in the Department of Physics and Astronomy

General introduction
The panel followed closely the instructions given by Uppsala University, which means that emphasis is laid on quality rating for ongoing research activities in terms of international standing. We agree with the guidelines that the evaluation of each department’s research should be a combination of rating, using the scale provided (see Appendix B), and qualitative arguments and wish to emphasise that the rating should not be read separately from the qualitative comments and arguments.

The top-quality category in the rating scale is problematic for research in sociology and education since it does not take account of the fact that sociological and educational research are highly context specific. The panel is reluctant to use the “top-quality” rating. Furthermore, rating should be evidence-based and the panel found that the evidence gathered for us did not justify such top-level rating. We acknowledge that we did not have access to bibliometric analysis, but even so, such analysis would not be sufficient additional evidence to warrant the use of this highest category. In our collective view top-quality cannot be claimed without substantive proof that the theoretical and methodological approaches of a given research unit are innovative and have had a strong influence on world-wide research. This rating should be reserved for cases where such proofs are delivered.

(Note: In the original panel report, the panel used grade 1 for insufficient and grade 5 for top-quality. In this final report the grades have been reversed [1 for top-quality, etc.] in order to correspond with the other panels that have used “numerical grading”.)

Department of Education

General assessment of the department
Education at Uppsala University was reorganised from January 2011 into a new combined Department of Education, its constituent parts having moved in to-
gather into the Blåsenhus, a brand new building, during 2010. Much of the data and the self-evaluation documents were prepared for the three former departments of Curriculum Studies, Education, and Education, Culture and Media. The panel met with each of these groups separately, as well as having a discussion with representatives of the newly combined department. As the research was presented to the panel under the three previous departments, we report here on each of these before offering an overall assessment of the newly combined Department of Education.

Department of Curriculum Studies (Didaktik)

The Department of Curriculum Studies is the only one of the three departments that identifies an overall research aim in its self-evaluation document. It states that the main goal of its research is ‘to create knowledge about the productive and dangerous sides of teaching and learning’ through analyses of the cognitive and normative dimensions of discourse practices and social habits, as well as meaning-making in educational situations. The work of two research groups was presented to the panel: Studies of Language Practices (STOLP) and Studies of Meaning Making in Educational Discourses (SMED).

Quality of research

The research work in STOLP, centrally focused on norms in reading and writing, has been influential in the Nordic countries and has informed the writing of textbooks for use in teacher training in Sweden and elsewhere. So far, the theoretical basis of this work tends to be derivative and has not itself generated theoretical development in its field. One reason is that the lead researcher has spent six years as Dean. The work is currently assessed at level 4 (acceptable standard) but with the potential for moving towards wider international recognition, especially when the lead researcher returns.

Research at Studies of Meaning Making in Educational Discourses (SMED) on the other hand is international in orientation and influence and also diverse. SMED brings an interdisciplinary approach that engages different layers of educational phenomena, focusing on an interplay of institutional (cultural), interpersonal (social) and intrapersonal (psychological) aspects of actions in educational setting. This approach has the potential to provide an important corrective to Anglo-American ‘didactic’ traditions which focus solely on psychology. Further, the panel finds promising the theoretical and methodological reformulations of the group that have occurred through collaboration with socio-cultural researchers and in cooperation with philosophical theories related to democratic education and pragmatism.

Some members of the group have a high volume of publications in Nordic
journals and research on meaning in science education, which first had a global presence in the late 1990s, continues to generate publications that are recognised internationally. Work on values in environmental education and education for sustainable development is being pursued energetically with clear links to leading international centres in this field. Overall this group can be characterised as working at level 3 (internationally recognised standard) with clear potential for moving to level 2 (internationally high standard). Members of the group have initiated developments in visual methodology, discourse analysis and transactional analysis all of which may be future areas of international presence and contribution.

Research environment and infrastructure
Approximately half of this department have been identified as research active and on the way to developing a vibrant research culture. Academic leadership in STOLP will benefit from the greater presence of the current Dean when she steps down from that position in June 2011 and is able to devote more time to research. The physical infrastructure in an attractive new building places it among the best in the world in this respect.

Networks and collaborations
STOLP has strong networks in Sweden, which will be further strengthened by the formation of a graduate school in its field of activity. As indicated above, SMED has strong international networks, especially in science education in general and environmental education in particular.

Opportunities for renewal and emerging science
The former department has begun to develop a coherent research strategy, which may now be further developed in the context of the new Department of Education. It has identifiable teams, which may usefully be extended to help more members to become research active.

Actions for successful development
External funding has traditionally been below that of the other departments, but was reported to be on an upward trajectory in the current year. It will be essential to pursue external funding if the quantity and quality of the work is to continue to improve.

Effects of the KoF07-evaluation
KoF07 indicated that this department has been remarkably successful in view of the limited resources that had been made available to it and that the increased research resources that have been allocated to the department have been fruitful. Its attempt to integrate theory into practice and its strong curricular focus are particularly notable.
Other issues
The panel finds it surprising, in view of its provenance, that this department has not been more involved, where that research is appropriate, in applied research of the kind developed by other teacher training departments. It has also been surprisingly uninvolved in using its research to inform the Swedish government’s reform agenda, although there are some examples of this, as in the case of geography education.

Department of Education (Pedagogik)

This Department of Education was previously located in the Faculty of Social Sciences and has now moved to the Faculty of Educational Sciences. It joined the other two departments in the Blåsenhus in 2010 and merged with those departments in January 2011. The panel received presentations from three research groups, namely Studies in Educational Policy and Educational Philosophy (STEP), Studies in Childhood, Learning and Identities as Interactional Practices (CLIP, formerly ELSIE), and Studies in Higher Education (SHE).

Quality of research
Studies in Educational Policy and Educational Philosophy (STEP) has operated successfully at levels 3 and 2 (internationally recognised and internationally high standard, respectively) in the past, especially through its pioneering work in evaluation studies and its work on education policy developments, known both nationally and internationally. The group was identified as a gold nugget in KoF07, but is currently operating only at level 3 (internationally recognised standard) and could drop further in the absence of publications in high quality international outlets. It continues to conduct good quality research but the extent of its international recognition beyond the Nordic countries, has diminished in recent years. A current project on the role of the school superintendent involves a large number of international partners, and has generated considerable enthusiasm for comparative analysis in this field. But it is impossible for the panel to judge the likely quality of outputs at this stage, as even the Swedish case study has yet to report.

Studies in Childhood, Learning and Identities as Interactional Practices (CLIP) is concerned with socially-situated interactional practices and their relation to broader educational contexts and ideologies. Central to the group’s investigations is ethnomethodology as a means to study questions of identity and learning in formal and informal educational settings. CLIP continues to show promise as a research group with dynamic leadership, and work in childhood studies published in one of the leading international handbooks in this field. This promise was noted in the KoF07 evaluation. Childhood studies is also im-
important internationally, with evidence of contact with leading European figures. The group also makes a strong contribution to the field of methodology in its use of situated conversational analysis (CA). It is also notable that this group is strongly connected to leading international figures in CA. Overall, this area of work is judged currently as at level 3 (internationally recognised standard) and, if it continues to develop, is likely to achieve level 2 (internationally high standard) in the future.

Members of Studies in Higher Education (SHE) have themselves come to the conclusion that, with the imminent retirement of its senior figures, it will cease to operate as an identifiable research group. Although it has been significant in the past, it is currently operating at level 4 (acceptable standard) and, unless there is a deliberate effort to revive it, the panel agrees that it should be disbanded once current doctoral students have completed their studies. Studies on higher education have however been taken up in other areas of the department research programme.

Research environment and infrastructure
In the past, this was the most research intensive of the three departments that have formed the new Department of Education. There would be mutual benefit in developing closer links with related work in the two departments it has now joined. The new building provides high quality physical infrastructure within which this interaction can be encouraged to develop.

Networks and collaborations
For many years, STEP has had strong links throughout Sweden, the Nordic countries and elsewhere in Europe and North America. More recently, particularly in the context of the current project on school superintendents, collaboration is evident with a much wider group of countries. CLIP also has strong international connections throughout Europe.

Opportunities for renewal and emerging science
The most promising area of research at the present time appears to be in CLIP, where there is strong leadership and a clear sense of direction. The scope for further development in STEP after the retirement of its senior professor remains unclear and any future depends on investment in new senior research posts. SHE has regretfully accepted that, on the retirement of its present leadership, it will cease to operate as an identifiable research group and the panel makes no recommendations for its revival at this time. However, the retirement of the leader of this group may offer an opportunity to renew the leadership of STEP.

Actions for successful development
The work of CLIP could be further strengthened by developing stronger links with BUV, the Children and Youth Studies group within the former Department of Education, Culture and Media, as well as with the Sociology Depart-
Effects of the KoF07-evaluation
The panel notes that the future of STEP was a concern raised in KoF07 and that, although the group has been able to secure some external funding and new staffing, the decision not to fill the Chair places a question mark over its future. So in the medium term, the future of STEP is no clearer than it was at the time of KoF07.

Other issues
This former department, and particularly STEP, has a history of critical engagement with education reforms introduced by successive Swedish governments, particularly through evaluation activities that have gained international recognition. Research on recent reforms, such as free schools, which have become a focus of international debate, could help to revive the group’s fortunes.

The panel also notes an irony in the fact that SHE, the research group on higher education, is to be phased out at a time when there are key issues in higher education to be addressed, and that collaboration might be possible with other departments with an interest in higher education. But currently there appears to be no appetite for revival.

Department of Studies in Education, Culture and Media
Research in this former department has been organised in two research groups, Sociology of Education and Culture (SEC) and Children and Youth Studies (BUV). Both have strong links with other departments within Uppsala University and elsewhere in Sweden. SEC expressed serious reservations about its organisational location within the new Department of Education.

Quality of research
The work of leading members of SEC demonstrates a high level of expertise in applying the theories and methods of the French sociologist, Pierre Bourdieu, to the construction and analysis of a range of datasets about various elite and professional groups in Swedish society. Its originality is acknowledged by the group to be empirical rather than theoretical, although the group draws on a range of disciplines, particularly history and sociology. The work of this group is highly regarded in Nordic circles, and it includes collaboration with leading scholars in France, who also give courses in Uppsala and thus have contributed to an
internationalisation of the university community. However, this group has not published widely in international journals and has therefore not attracted much international interest beyond the Nordic countries. Furthermore this work is characterised by limited efforts to develop theoretically and conceptually, which have reduced its impact on the different international fields with which it seeks to interact. The research strategy of the group has given priority to the assembling of relevant databases rather than international publication, which again has held back wider recognition. Nevertheless this research unit contains a group of highly qualified senior researchers and a strong group of doctoral students and research assistants, who have made important contributions in research reports, conference papers and a few publications in international education journals such as *History of Education*. The group’s work is currently assessed at level 3 (internationally recognised standard) for the Nordic countries but as lower due to lack of visibility beyond that geographical area. It continues to show the promise that led KoF07 to identify it as a ‘gold nugget’, but has not yet delivered on that promise. The potential of this group’s work, the panel believes, lies in an improved international publication strategy aimed at focusing more on empirical and methodological development and theoretical innovation.

BUV is a new research group, which has been established for less than two years, although some of its members have a longstanding and credible presence in Youth Studies, especially in the Nordic countries. The work of this group on rural youth in the Nordic countries is of substantial importance and has the potential for making a key contribution to Youth Studies. This work is currently assessed at level 4 (acceptable standard) with level 3 (internationally recognised standard) potential.

Research environment and infrastructure
SEC provides a lively research environment for its members within Uppsala and beyond, but currently seems to operate separately from other groups that have been brought within the new Department of Education, including BUV. Drawing on the experience of other groups working with large datasets, a long-standing research tradition in Sweden, the group might also want to reconsider the balance in its work between the assemblage of data and analysis/publication and also the personnel involved in each of these activities.

Networks and collaborations
The panel notes a strength of SEC is that the group had many associated members from other faculties at Uppsala and from other universities in Sweden, who contribute to its work and help create a lively intellectual culture.

As a promising new group, BUV needs to be further nurtured and could benefit from linking up with others in Youth and Childhood Studies, possibly including the CLIP group within the new Department of Education, and sociologists and geographers elsewhere in the university. These links would provide greater synergy than exists in its current coupling with SEC.
Opportunities for renewal and emerging science
The datasets produced by SEC provide a wealth of opportunities for socio-logical and historical analysis and publication. Within Uppsala, the SEC team is vulnerable particularly if its current leader retires, although its research students provide considerable promise for the future.

The panel notes that the leader of BUV will shortly become Dean of Educational Sciences: It is concerned that this may have serious implications for the development of the group at such an early stage of its existence.

Actions for successful development
Resolution of outstanding organisational issues is essential for both SEC and BUV if their work is to thrive. The panel’s view is that genuine integration into the new Department of Education, together with increased networking with other parts of the university, will provide an important strategy for the development of both groups.

Effects of the KoF07-evaluation
KoF07 identified SEC as a ‘gold nugget’ but commented on the potential danger of its work as becoming too routinised as an application of a specific Bourdieuan approach (while Pierre Bourdieu insisted that empirical work should involve theoretical developments). The panel is not convinced that this danger had been avoided and suggests that the challenge afforded by the location of this work in the new Department of Education is more likely to stimulate creative developments than threaten its integrity, as feared by members of the group.

Other issues
The location of SEC in the new department is seen by some as a source of tension with the potential to detract from the pursuance and development of its intellectual agenda. This situation, the panel suggests, needs to be resolved as a matter of urgency.

The new Department of Education
The formation of the new department provides an opportunity to bring together a range of disciplinary and inter-disciplinary approaches to the study of Education across a variety of substantive fields. As yet, the panel finds limited evidence of progress in developing a research strategy that would maximise these potential synergies. An attempt was made to do this when the three separate departments were due to be co-located but in the view of the panel, the five themes identified at that time do not embrace all departmental activities and thus need to be revisited now that the three departments have been com-
bined organisationally. Research leadership issues also need to be addressed as key figures in the former departments retire or take on onerous management responsibilities. Although new investment, beyond the six postdoctoral appointments already anticipated, will be required to develop the most promising areas of research, the panel is of the view that organisational, strategic and leadership issues need to be resolved beforehand.

**Quality of research**
In its comments on the former departments, the panel has identified a number of research groups that are operating at level 3 (internationally recognised standard) and have the potential to progress to level 2 (internationally high standard), while others have the potential to progress from level 4 (acceptable standard) to 3 (internationally recognised standard). We have also suggested that their capacity to do so could be enhanced by developing links with other parts of the new department and other departments in the university. Most importantly, the work of the department needs to become more visible in contexts beyond Sweden and the Nordic countries. At the same time, the panel appreciates the importance of the impact made on Nordic countries and that for some areas (such as mother tongue research) this is an appropriate geography to reach.

**Research environment and infrastructure**
The overall research environment is likely to be improved by the bringing together of the research intensive Department of Education (Pedagogik) from the Faculty of Social Sciences and groups that have built up research within the teacher training context. There will also be opportunities to bring the rigour of social scientific research methods to bear on the professional issues that concern teacher educators. The physical infrastructure of the new department is world leading and may help attract new academic talent to the department.

**Networks and collaborations**
Taken together, the members of the department have an impressive array of links in Sweden, the Nordic countries, other countries in Europe and, to a lesser extent, more widely, with particularly strong links with South Africa. It is not clear that they have yet fully exploited these links or taken on leadership in international collaborations to the extent that might be expected. The department is currently less visible in European networks in Education than some other Swedish Schools of Education. The panel saw little evidence of visiting international scholars or guest professors who might help researchers become more engaged in international collaborations.

**Opportunities for renewal and emerging science**
One area in which different parts of the department make a significant contribution in the Educational Sciences is in methodology and specific research
methods, with some apparent overlap between groups in this respect. The panel suggests that research methodology might be identified specifically as a line of future development for the new department and also that issues of methodology are not separate from but are integrally related to theoretical explorations and examinations. This latter element of research is only partially present in the research programmes.

**Actions for successful development**
The immediate need is the resolution of organisational and leadership issues to clear the way for the development of a much-needed research strategy for the newly combined department, including a publication strategy that exposes the work of the department to peer review in the wider international context.

**Effects of the KoF07-evaluation**
Although KoF07 identified some ‘gold nuggets’ in this part of the university, it is not clear to the panel that these have subsequently developed to the extent that might have been expected. Indeed, there is a danger that the best work from the past will not be carried through into the future. A number of issues identified in KoF07 remain unresolved, particularly in respect of leadership and collaboration.

**Other issues**
The newly combined Department of Education has more than 20 salaried PhD students. They are required to outline their plans for research and participation in Education in their applications, but when they are hired, are able to change their plans in collaboration with their supervisors and with the acceptance of the head of department. PhD students participate as a rule in a variety of research groups, and many also work part-time as research assistants. They also contribute to teaching, including teacher education, alongside tenured and other senior staff. Each of the former departments had its own PhD courses although doctoral students could take part in courses run by the other two departments. Several doctoral students have attended courses at other universities, in Sweden and abroad. A close integration of doctoral students into research activities is evident and will remain an important asset for the newly combined Department of Education.

Much of the best research in the department takes the form of applying existing theoretical and methodological approaches to the analysis of specific areas and arenas of educational activity. There is less evidence either of theoretical innovation or of the application of research to the improvement of educational policy and practice. A comprehensive Education Department of the sort that has now been formed is unlikely to be regarded as world-leading without making a greater contribution to either or both of these aspects.

In this connection, the panel notes that educational research also takes place in substantive subject departments elsewhere in the university and it is impor-
tant that this work should be recognised and built upon in the research strategy of the Faculty of Educational Sciences. For example, collaboration on physics education research, with national and international links and impact, has already taken place between SMED and the Department of Physics and Astronomy. This work draws on appropriate social scientific and educational theory, is explicitly oriented to ‘improving practice’, and has already achieved publications in internationally-recognised journals. The panel recommends strengthening this and other cross-university links in research on teaching and learning in higher education and that these be monitored regularly by the Faculty.

There are two general issues that we wish to introduce as a result of our conversations and readings of the documentation.

(i) The new priorities of internationalisation include a strong emphasis on collaboration, internally and externally. Education research crosses the social sciences and humanities in interdisciplinary ways and the model of strong group collaboration may not always be appropriate for the production of knowledge and intellectual innovation in this field. There is therefore a need for balance between large group production of, and small, individual contributions to, knowledge and intellectual innovation.

(ii) Within the newly combined Department of Education, there seems to be a strong emphasis on methodological issues and development which are not, however, necessarily tied to conceptual and theoretical innovations and cross-fertilisation of ideas. This focus on methodological issues has at times limited intellectual inventiveness and dynamism.

Department of Sociology

General assessment of the department
The Department of Sociology is the oldest of its kind in Sweden. Today, it is a department of middle size for a sociology department in a major university in Sweden, and shares many of the normal traits of other social science departments when it comes to finance, teaching loads, etc.

The Department of Sociology does research into several important areas of relevant applied sociology, something that is reflected in the department’s ability to attract research grants.

After the KoF07 assessment reports were issued, the department made some efforts that have resulted in clear improvements in some areas. A thorough mapping of research and an attempt to categorize thematic research areas are examples of that. After having lost three Chair Professors (because of retirement, chiefly) and other key staff members, the department has been able to start recruiting able people to replace them.

Substantial research is carried out in a number of important areas. However,
not everything is rosy. The general impression of the research is one of fragmentation and an uneven and scattered pattern of interest areas. Some important areas of sociology seem to have vanished from the department’s horizon, for example political sociology, the sociology of organization, social differentiation, the professions, and more general, questions of class. At the same time, staff members seem to collaborate little in areas where research is done. Clearly, two areas stand out, both qualitatively and as good examples of internal collaboration. These are the sociology of aging (Social Gerontology) and the sociology of disability, which are strong areas for the department and for Uppsala University. It is, however, a problem that there are few other visible efforts to engage in either department-wide or research-group wide inter- or multidisciplinary research, except in the two areas mentioned.

Most collaboration seems to be the result of individual initiatives. Thus staff members have made strong contributions to international collaborative work on the history of intellectuals working within social science, and several PhD dissertations have contributed to wider discourses.

As said above, in preparation for this assessment exercise, the department made a laudable effort to map its research. It would have been useful for the department if the mapping had taken place sooner after receiving the KoF07 report. It could then have been the basis for a research strategy for work in the period now being evaluated. That undertaking remains important, as the mapping exercise strengthens the current impression of fragmentation.

The department suggests four thematic areas as umbrella categories for its future development. These, however, are too far from being organized efforts to be useful as units for evaluation. On the other hand, the domains of chair professors do not represent the department as a whole. In the light of this, the panel has decided to look upon the department as one unit for the assessment.

About half of the research-active senior staff (professors, senior lecturers, etc.) are women. In the PhD candidate category, women are a large majority. Several key members of staff have recently retired, and all vacant posts are not yet filled. The age profile of the department staff is a matter of some concern, as the average age of the professors and lecturers is close to sixty.

**Quality of research**

While most professors of the department are productive in research terms, there seems to be no tradition of research organization, even in its minimalist sense, in the department as a whole. It does not seem to be considered that professors should be responsible for research quality assessment of anything else than other than PhD theses, a condition that has left young researchers in a less than conducive situation. This is reflected in the quality of the selected articles distributed to the panel as typical examples of the research efforts in different research areas. On request, the department sent eight articles to the panel. The panel agreed that these articles varied considerably in quality, ranging from insufficient to excellent, as judged against the rating criteria.
KoF07 judged the field of “Childhood Studies” to be one of the “gold-nuggets” of the department. The individual researchers engaged in these studies continue to make an important contribution, especially in relation to the understanding of children’s lives in contexts of violence and family troubles. This work has gained some international recognition which could be built on to good effect by means of a more sustained flow of papers to relevant international journals.

The panel judges that the overall grading of the department is acceptable (4) with outliers in the internationally recognized (3) and internationally high standard (2) brackets, for the fields of gerontology and disability research. Some of the best work may even develop to be “outstanding” (1).

Research environment and infrastructure
The department is located in a modern, well-equipped building in a beautiful campus setting.

The composition of the teaching and research staff has changed since the KoF07 evaluation. Only one (out of four) of the chair professorships has been filled, that is in Social Gerontology. There are six promoted professors, and six tenured senior lecturers. With 17 doctoral candidates and several other researchers, the employed research staff at the department comprises 33 persons. There are also a number of affiliated researchers, some of whom are employed by other universities or university colleges.

Seminars are centred on PhD training activities and PhD projects constitute about the half of the research outputs of the department. These projects are generally of high quality but very diversified and therefore contributing to the somewhat fragmented profile of the department.

Networks and collaborations
Collaboration with the university’s “Institute for Urban and Housing Research” is and has been important, and has added to the department’s overall competence in sociology. The collaboration seems to hinge on one or two individual professors rather than on concerted efforts of the department, and has a particular focus on PhD education. Collaborative efforts with other departments and units in Uppsala are rare, and seem to depend upon the enthusiasm of one or more people.

There are, however, well-developed, cooperative relationships and networks between individual staff members and representatives of other departments outside Uppsala and in Sweden more widely.

Effects of the KoF07-evaluation
Among the recommendations of the KoF07 evaluation, at least two have been followed up in a constructive way: the strengthening of the “gold nugget” area of disability research despite the loss of key staff members, by the use of seminars as a mechanism for improving scientific quality. The area of studies on ageing
has also been nurtured, which is evident in the continuing research quality of that group.

The KoF07 evaluation identified similar problems and made recommendations about what could be done. One issue identified was the fragmented research activity of the department and the minimal collaboration at the local level, resulting in low intellectual synergy.

Therefore, the results of the mapping exercise undertaken by the department should be capitalised upon. The development of seminars may have been of some help in getting the department together, but on the whole – looking at the project portfolio – we see no significant increase in cooperation among staff members.

Another recommendation of KoF07 was that leadership should be strengthened to organize synergy and strategic planning. Judged by the fragmentation of research activities and the lack of strategic planning pointed out above, it is hard to see any implementation as a result of this recommendation.

KoF07 also pointed to resource problems in research that may stem from the strict separation of teaching at the lower levels and research. This is a university or Faculty problem, and very little of it can be solved at the department level.

Opportunities for renewal and emerging science, and Actions for successful development

The recruitment of new staff might lead to a breakthrough for some of the activities of the department. Accordingly, there may be opportunities for renewal due to the new positions planned for the department – in quantitative methods, social psychology and the sociology of work life, and the recent employment of senior lecturers in social work. While only two of the above mentioned areas may become separate research groups, existing projects could be strengthened, drawing upon the increased expertise in quantitative methods and social psychology.

Theme structure may also lead to improved group structure. The department underlines that the two thematic areas of Social Positions and their Intersections, and Critical Studies on Policy, Culture and Practice are the most promising. The panel suggests that less overarching thematic groups consisting of people and their projects, might be a better basis for a new department structure. This might involve research groups consisting of one or two professors in leadership roles, and several postdoc positions and PhD candidate positions. Such groups might be able to arrange more targeted seminars reflecting the research programmes, and could be bases for recruitment to the department.

KoF11, it is hoped, will lead to the development of strategies for personal development, as well as for publication.

Other issues

The doctoral candidates that were interviewed by the panel were enthusiastic, well read and aiming at an academic future on the international scene. The
general policy of the department, the “thousand flowers” approach, is also applied to the PhD training, and the recruitment principles for new research students. However, this individualism mitigates against strong network formation. If groups and strong networks are not formed during the research-training years, there is less chance that young social scientists will ever learn to work in strong groups and networks. This is clearly one of the governance problems in the department of sociology, along with the low degree of organized responsibility taken by the professors.

Department of Food, Nutrition and Dietetics

General assessment of the department
FND is a small research unit with two professors (one chair, one promoted). It has a well-conceived strategy of tailoring its teaching activities to its research programme. Its mission is to understand ‘food and health in a social perspective’. It has two research foci: the meal in the public sector and the communication of dietetic knowledge. These two topic areas act as effective and practical umbrella for its work on the social aspects of eating and the formulation and transmission of knowledge about nutrition respectively. Its research projects are varied and the results are mostly reported in refereed journals of good international reputation. Leadership within the department for research appears strong.

In its own field, social aspects of food and eating, the unit compares favourably with other departments in Sweden. This is recognised in the recent award to lead the Graduate School (forskarskola) in Home Economics, a national research consortium, for four years. This is both prestigious in its own right and will provide resources to develop a third theme of research, supported by 6 new postgraduate students who are working on how food, meals and health have been taught and learned in Home Economics. The research theme dealing with public meals is of international significance.

Quality of research
The panel does not dispute the claim that this is the strongest unit for the study of social aspects of food and eating in Sweden. Its focus on two restricted areas of research makes for high quality work that can have international significance. Much of the research is published in peer-reviewed English language international journals, among the most prestigious in this field of research. The journal articles reviewed by the panel were throughout of a good standard, as would be expected given the journals in which they were placed. The unit thus targets its efforts effectively and to best advantage.
The research on meals in the public sector, and especially on those for vulnerable groups, is distinctive in the international context. This work is a source of regular invitations to make presentations internationally. The topic might be expected to become more important in the near future, with the social and cultural aspects as important as that of nutrition. Overall we would judge this field to be at level 3 (internationally recognised standard) with potential for parts of the work to rise to level 2 (internationally high standard) if additional resources are made available.

The research on communication of dietetics is perhaps less distinctive, and might benefit from more consideration of theoretical literatures and methods used in public health nutrition/nutritional epidemiology. Nevertheless the research is already supplying sound science essential for policy formulation and strategies for public health. No unit in the field of nutrition and health could afford not to be engaged in such investigations. Engagement in comparative studies would extend the department profile and be significant for the development of scientific knowledge and scholarly networks. We assess communication of dietetics at level 4 (acceptable) with potential for 3 (internationally recognised standard).

The subject matter of FND is multi- and interdisciplinary and thus faces predictable problems of two kinds. First, there are intellectual matters of integration and theory development; and second, finding suitably high quality journals for reporting of research. FND is a strong unit in a scientific field which is theoretically and analytically embryonic. Uppsala thus appears to have significant comparative advantage in a field of considerable policy relevance in which there will remain demand for evidence and guidance upon interventions for the foreseeable future.

**Research environment and infrastructure**

FND is organizationally placed within the Faculty of Social Sciences but physically located at the Campus of the Faculty of Medicine. This physical location is not ideal for the stream of research that is primarily inspired by social scientific issues but does have useful synergies for those with interests in clinical and public health nutrition.

The unit is small and this hampers the development of the research programme. The department has three undergraduate degree programmes involving 300 students: clinical dietician, administrative dietician and home economics.

Most of the field research is carried out by PhD students. It was estimated that 60–70% of the published articles included a PhD student among its authors, reflecting what are perceived as burdensome teaching loads by permanent staff. The dependence on PhD projects for much of the field research may to some extent affect the quality of the research, but it appears that arrangements for supervision and daily working procedures are effectively minimising problems. The staff does not include any postdoctoral researchers.
Networks and collaborations
There is some collaboration with other units within Uppsala University, for example, articles on disability have been written with researchers from the Department of Government. Nevertheless, the relevance of further and stronger collaboration is acknowledged. There is also collaboration with scholars at other universities, through particular research projects, though again this could be extended.

Visiting scholars seem to be few, but the department did host a Nordic PhD-school with established international scholars as lecturers in 2010.

The department had been a partner in various international projects funded by the EU, in comparative research on migrants, and in a joint project planned together with Tufts University, USA. Staff attend international conferences and are well aware of valuable ways to engage in international networks. Nevertheless, the panel is of the view that these activities are not as frequent as might be desirable, and that more international scholars visiting Uppsala would be beneficial.

Opportunities for renewal and emerging science
FND plans for development are relatively modest, but appear realistically so in the light of available resources. Frustration about the lack of postdoctoral positions which could build further critical mass is understandable. Opportunities exist for this field because it is a multidisciplinary area dominated by applied empirical studies of food behaviour. Application of scholarship via appropriation by or collaboration with social science disciplines which are more theoretically oriented and better developed could be pursued to further the scientific contributions and give the work a more critical edge. Theories of consumption and taste, of mass communication, of behaviour change and of social stratification and inequality might usefully contribute to the framing and interpretation of FND’s research.

The panel considers that in order to secure a robust and deserved reputation for research (and research training) in the communication of dietetics more input is required of expertise from the areas of communication sciences and the social science of interventions for behaviour change.

There has been a PhD programme since 1991. Supervisors’ practices encourage PhD students to collaborate internationally. The PhD theses from the unit consist of articles written in English and published in international journals. PhD students take courses outside the FND, in various departments and locations, in Sweden as well as abroad. PhD students co-publish with senior researchers, aiming at the best journals in their field.

The National Graduate School in Home Economics with new posts for PhD students is likely to increase research activity and provide good opportunities for national and international collaboration. Provided that future PhD theses will consist of articles published in internationally recognised journals, the international reputation of the unit should increase. At present, the volume of publications is adequate but could be increased.
**Actions for successful development**

Staff recruitment, at senior or postdoctoral level, would further enhance the quality of the published output. It would also allow expansion of research activities. FND is well aware of the importance of achieving international recognition through collaboration and publication and expresses a will to pursue such objectives. The panel supports this. A clear, long-term plan for the future of the unit would be advantageous.

**Effects of the KoF07-evaluation**

The department has changed its former name Domestic Sciences to Food, Nutrition and Dietetics which entailed the departure of the former unit Textile Sciences from the department. Thereafter, research in the department has focused on two research areas: the meal in the public sector and the communication of dietetics. This strategy of concentration has been successful.

**Other issues**

Postgraduate training, which has an international dimension appears to be effective and PhD students are well integrated into the unit’s activity. The department links its own research into teaching to the benefit of both. The research area of FND is by its very nature one with practical relevance and therefore its research is being communicated to practitioners and policy makers. The results of the studies are applied to the care of the elderly or disabled and other vulnerable groups. The stream “communication of dietetics” has practical significance in regard to home economics teaching, dietary counselling and nutrition policy. Knowledge on how food and nutrition are communicated and understood among different population groups and professions provides a starting point for planning of dietary interventions at individual or community level.

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**Physics Education Research in the Department of Physics and Astronomy**

[Also evaluated by the Physics panel, see page 310.]

This research group has been established as a division within the Department of Physics and Astronomy with a view to promoting excellence in the teaching and learning of physics and engineering, especially the improvement of student retention.

**Quality of research**

This work draws on complexity theory, social science and educational theory
to research on physics education at the level of higher education. It has already achieved publications in internationally recognised journals and gained funding in highly competitive national and international contexts. Previously this research approach received little attention in the Anglo-American world where most research focused on improving science education in schools. This group’s research has also provided an important contribution within Sweden for the recruitment and retention of undergraduate students in the field of physics. This contribution has had an impact internationally since issues of recruitment and retention in the fields of science are major issues in most western industrialized countries. Further and as important in the more general context of science education, the theoretical sophistication and methodological approaches of the group have important implications for the general field of science teaching at all levels of education. The panel is impressed by the group’s international activities, contributions to the study of teaching science in higher education, and therefore assesses the group’s current research at level 2 (internationally high standard) with the potential to become world-leading.

**Research environment and infrastructure**
The research has been granted significant funding and is regarded as a key research activity within the larger Physics Department. It is a well-balanced group in terms of experience (less so in terms of gender) and has dynamic leadership.

**Networks and collaborations**
The group has strong international connections with researchers in South Africa, the EU and North America, as well as within Sweden and the Nordic countries. It has links with Research in Studies of Meaning Making in Educational Discourses (SMED) within the Department of Education, but the panel suggests that it might usefully develop further links with work on teaching and learning in other departments at Uppsala University.

**Opportunities for renewal and emerging science**
The panel perceives the group as being at the forefront of work in this field and clearly on an upward trajectory.

**Actions for successful development**
The group should continue to be supported at departmental and university levels and develop closer links with the Department of Education and other researchers on teaching and learning.

**Effects of the KoF07-evaluation**
This group was seen as promising in KoF07 but still in a stage of development. It has clearly established itself successfully in the university and beyond, in the intervening period.
Other issues
As noted above, it is important that the work of this group connects to other research on teaching and learning within Uppsala University, both within the Department of Education and in subject departments in other Faculties. The panel suggests that existing arrangements for collaboration in such work should be strengthened and that the Faculty of Educational Sciences should monitor its development throughout the university on a regular basis.
Panel 4

Scope of the panel’s evaluation:
Department of Government
Centre for Russian and Eurasian Studies
Department of Peace and Conflict Research
Institute for Housing and Urban Research

Introduction
Panel 4 focuses its comments on four major areas in relation to each of the four units we have evaluated: (1) Strong areas of research; (2) Emerging science and potential for renewal; (3) Evaluation of results of KoF07; and (4) Recommendations. Before moving on to the units we wish to make the following observations:

• Uppsala University appears to be burdened by too many layers of management: The Rector, the Vice-Rector for a domain, the Faculty, the department, and even sometimes layers within the department. That makes for about five layers between top and bottom, which appears to be excessive and not a product of any rational process of planning.

• We find that the system in which junior faculty members and researchers are hired as “lecturers” and then offered the option to buy themselves out of the majority of their teaching responsibilities creates great uncertainty and perverse incentives. First, this system creates considerable uncertainty among younger faculty which lowers their mobility and also clearly makes them more risk averse. Second, in the ‘scramble for funding’ these young scholars are driven to write a large number of grant proposals and participate in a large number of different projects. We are concerned that this system does not allow these scholars to focus on longer term projects and deeper analysis of problems. They, instead, have the incentive to move from project to project and may often have short term intellectual horizons. In short, a professionally successful academic strategy in Sweden may not produce the best science.

• While in some individual cases teaching burdens may be excessive, in general terms teaching loads seem to compare favourably with those found in other countries. We consider therefore that the issue may concern more strategic leadership with respect to the rational organisation of teaching – and the relative status attached to teaching and research – rather than the volume of teaching in itself.

• Consider ways to create fewer barriers to international mobility and recruitment.
Department of Government

Strong areas of research

The Department of Government is a large, comprehensive political science department. This means that it preferably should not only provide the basis for good research in specific subareas of the discipline, but also offer teaching and research within a broad spectrum of general political science. In our view the department passes this test with a good margin. The research published by the department covers all major fields of political science and also includes the specialized thematic and theoretical focus necessary to offer in-depth research at an international level. Obviously the research quality is better in some areas than in others. A general grading of the department could in our view be based on the fact that there is much very good work of an internationally high standard; there is also some work of an internationally recognized standard. Some of the research groups will be within or close to the ‘excellent work’ category. In a Nordic comparison we consider the department to be in the top group of political science departments.

We noted that in the previous KoF07 report there was concern about a “discrepancy between symbolic and formal leadership”, “antinomies with the academic hierarchy” and “values of individual autonomy.” We interpret these comments as indicators that there were problems in the structure of the department and relations between academic ranks. In our view, these problems have been overcome to a remarkable extent. Indeed, it appears to us that the pendulum may have swung too far in the opposite direction. In general the academic atmosphere strikes us as lively and open, and the department appears to have tackled the recent generational shift well. No doubt there are many strong researchers also in the upcoming generation of scholars that the department can build on in the years to come. To make the department flourish, however, one needs careful nurturing of academic talent through academic leadership and organization. To put it simply, we recommend that the senior faculty carefully consider their leadership role in the department. We would not want the department to return to the days of overly strong hierarchies, but stronger leadership does appear in order. Specifically, while we have not evaluated teaching in this department, we suspect that stronger leadership could help the younger scholars strike a better balance in their time allocation between teaching and research.

The various research groups identified by the department vary in homogeneity and also in the strength of group coherence. On the one hand they have the character of administrative groups, on the other there are seminar activities and contacts indicating more of an organic group. Group membership is not fixed, but depends on the researcher’s projects and interest. This caters for the dynamic character of all research and opens up new research perspectives and personal development. At the same time it makes for less commitment and both the broader milieus and the individuals become more vulnerable. These
arrangements are nevertheless a good start for building broader, integrated research groups and a basis for pursuing more long-term funding as well as creating platforms for more internationally recognized impact research.

All research groups that were presented to the panel encourage internationally embedded research and do publish internationally. They actively work to publish in the better journals/publishers although resources, notably time constraints, sometimes also make publications in less prestigious journals acceptable.

The five groups differ in their publication volume, quality of publication channels and integration in and cooperation with international research networks. There are also differences between clusters within the research groups. The most successful ones we found to be clusters within welfare politics, political economy, gender studies, IR/EU-studies and state-building. However, there are strong talent and potential excellence to build on within all groups.

The department is an attractive place for PhD-studies and the department seems to have created a fruitful milieu for them. We did not get the full statistics on this, but there may be some concern regarding turnover.

Emerging science and potential for renewal

The Department of Government has several strengths. The open intellectual environment, the obvious intellectual respect that members of the faculty have for one another and the willingness to work together and read and comment on each other’s work have to be highlighted as significant sources of these strengths. The department has strong elements in all of its five major areas of research. In this context, the department’s emphasis and strength in the political economy of the welfare state is notable. The hiring at the senior level of one of a leading scholar in this area will certainly contribute to an already strong and growing research agenda. This research theme can build on the strengths already present in the department, but also has added potential because it can work with the new Center of Excellence program which will be operated in association with the Department of Economics. We would like to encourage the department to build on its ideas to integrate the massively important issues of demographic change and its implications of aging populations with issues such as political culture and sustained support for the welfare state – especially in countries with large welfare states like Sweden. Indeed, we go further to note that the Uppsala department should benefit from its comparative strength in this regard. Sweden’s continued experimentation with models of social welfare delivery is of enormous interest to academics and policymakers alike throughout the democratic world.

We were also struck by another very promising area of research being initiated in the department in collaboration with colleagues in Economics as well as Sociology and the Karolinska Institutet, where they are using the extensive “twin registry” to investigate the role of genes in influencing political behavior and attitudes. No one on our committee or for that matter in the social science
community generally, can know where this research will lead and/or whether the interesting findings generated so far will in fact “turn out”. Certainly, this is a very controversial topic for research in Sweden, as elsewhere. But, this is by any measure pioneering research. We also believe that this area of research might be fruitfully further combined with work in experimental methods, another promising relatively recent development. Moving in these directions could put the department at the forefront of social science methodology and theory building in the upcoming years.

Another promising direction of future research in the department lies in the bringing together of discourses from the sub-seminar on state building and democratization with ongoing research in the group on peace and democracy in post-conflict societies. Here, some of the longer-standing debates on constitutional design and power sharing arrangements in recent democracies could be brought in line with insights from research on election-generated violence and conflict-ridden societies. Such discourses have acquired renewed relevance by current events in the Middle East. Contributions from the political theory group could also be expected in this respect.

The strengthening of the relatively small group on public administration and policies should be further encouraged. Some synergy effects could also be developed with a stronger emphasis on governance and democratic performance in the democratization seminar. These remarks are not meant to downplay the important research taking place in other major subfields, including gender and IR.

**Evaluation of results of KoF07**

The main recommendations of the KoF07 panel were in general to clarify the role of promoted professors compared to the chairs, to secure long-term finance for a predictable recruitment policy and to find a better balance in the overhead costs attached to external projects. For the Department of Government in particular the challenges of transition after a number of retirements was focused, especially the clarification of leadership roles, both administratively and academically.

Among the first general points some of them are outside of what the department could do on its own. The role of promoted professors did not now appear to be a pressing issue although it still may have links to questions about the general leadership structure. Long term finance is still an issue with repercussions for both time used for producing applications for external projects and for creating better opportunities for nurturing potential talents to fill new positions at the department.

We can also note that after the KoF07-review the department has continued its good work to increase international publications, also in highly ranked journals. The main challenge identified in the review, however, was a too hierarchical leadership structure. It is our clear impression now that the department has managed to make the leadership less hierarchical and more transparent. In
doing so, however, we also have the impression that the changes have created too little leadership, not in the administrative field but in academic terms. We interpret the call for a research director in this light. The department would benefit from a strengthened strategic leadership, leaders guiding developments more closely and advising academic staff about promising alleys for future research as well as to coordinate, or at least monitor, the applications for external projects more closely.

**Recommendations**

- There continues to be a lack of control over basic input factors connected to funding. It would be helpful to obtain more basic, long-term, and stable funding. Considerable time is spent on application writing and even though the department’s success rate is fine, this is an insecure basis.
- The department has successfully confronted the leadership challenges identified in KoF07. But personal autonomy, while a valuable good, must be balanced by leadership to develop the overall department strategy. This needs to be confronted at a time where the department is dynamic, increasingly internationalized in terms of research publication and collaboration, and with potential to become a world class force in some research areas.
- The department wishes to hire a research director to give greater strategic direction. This would be valuable. In the meantime, better use could be made of existing personnel resources to co-ordinate, streamline and develop research groups; to take the lead in more intensive collaboration across existing groups; and to act as a role model for younger scholars. There is plenty of force and talent among existing professors to pick up and develop that function. In short, the dynamic but also somewhat anarchic bottom-up initiatives in terms of research initiatives should be coordinated through a combination with more strategic leadership.
- A screening committee should be considered when it comes to larger applications for funding. It would be made up of scholars with membership experience in research councils.
- Expectations of young scholars in terms of success criteria concerning research and publication, the obtaining of external funding, teaching and relations to students, as well as interactions with society in general could be spelled out in clearer terms. There is, for example, a current debate about publishing monographs versus publishing articles, and about quantity and quality when it comes to publication in general. The department should aim for the highest possible quality in every area of publication.

Overall rating: Internationally high standard.
Centre for Russian and Eurasian Studies

The Uppsala Centre for Russian and Eurasian Studies (UCRS) has existed for less than eighteen months. In 2009, the Faculty of Social Sciences successfully applied for a government grant which was part of a “strategic initiative” to conduct research on a politically important geographic region and received funding for a multidisciplinary research centre with a matching grant from the university. The Centre got off the ground as of January 1st 2010, and so far the main result is the set-up of an organizational framework consisting of three research directors, and full professors within the university from economics (the previous Russian/Eurasian centre merged with the new UCRS), political science and theology as well as an administrative director (Docent/PhD also from the previous centre) with a small staff (altogether four). Not all of the research directors work full time at the centre; one having a chair at the Department of Government. Some twenty affiliated researchers from the university belong to such different departments as anthropology, economic history, geography, law, linguistics, literature, mass communication, and peace and conflict research. During 2010 another 11 researchers were recruited from outside on rather short-term contracts (up to five months); basically an international visiting scholars program (another 6 have also been at the Centre on briefer visits, usually a week). Furthermore, a vibrant research seminar with a number of invited foreign guests was part of launching this centre: 14 seminars in the spring as well as a one-day symposium, and 19 regular seminars during the fall of 2010.

Most recently during the spring of 2011 apart from the weekly seminar under the leadership of the research directorate, 21 seminars were held between January and May, a two-day conference on power and legitimacy with some twenty participants was organized in cooperation with the Department of Slavic Languages at Stockholm University and the Royal Swedish Academy of Letters, History and Antiquities. On average, some twenty persons have attended the weekly seminars, and in several cases the visiting scholars have presented papers at these seminars. Moreover, during 2011 8–9 persons have been or are in the process of being recruited for postdoc positions, and people from other departments with external funding have also moved to the centre. Apart from a senior visiting researcher from Moscow, the evaluation team met four younger scholars (PhDs and PhD-students) with different specialisations.

The centre has already produced results and is definitely off to a good start. There is a vibrant and dynamic milieu and a sound, well considered approach to interdisciplinary scholarship. Nevertheless, it is too early to systematically evaluate the first stage of what will most likely be the first five-year phase in the history of this centre. The plan is of course to make an evaluation at the end of this period. The stakes are high, the centre strives for academic excellence, and although it is too early to say much more than what has been spelled out above, a few items may be added. After a honeymoon with invited guests and affiliated researchers at the university it is time for the research directors to set sail.
for the future. Following the original application, three rather broad themes are on the agenda – (1) state and markets, (2) identity formation and (3) Russia’s neighbouring countries – but it was not clear from the presentation given how these research themes would be further advanced and made more coherent.

**Recommendations**

After a successful start the Centre now needs to begin thinking about its focus and longer term profile. This is a challenging task because the process must take place during a relatively short period where the Centre must also establish sufficient academic credentials in order to qualify for the continued funding that will make it a permanent institution. We have the following recommendations with regard to this process:

- Two of the three research directors are also employed as professors at other departments of the university. That creates a heavy demand on their time and permanently conflicting obligations because their full attention is really needed at two places simultaneously. Some arrangements need to be made to alleviate this dilemma. One possibility is to secure funding that would compensate the “lending” institution so that the professors could better focus on UCRS. The optimum long term solution would be to have the research directors fully devoted to UCRS.

- In some ways UCRS does not fit smoothly into the university system. This needs to be looked after.

- Most importantly, the three research areas, combined with the large number of countries that the Centre seeks to cover, create a risk that resources will be spread too thin. The research directors will have to think about ways to sharpen the focus of the research areas.

- This leads towards the master challenge of how to create a clear profile, even a brand name, in a period of three to four years. While valuable, the data base on electoral systems and political parties alone does not seem to be sufficient to create such a profile.

- Instead, we suggest that the UCRS might consider creating a journal which promotes the centre’s research, not as an alternative to publication elsewhere, but as a flagship, i.e. a vehicle for demonstrating to others the new and exciting aspects of the centre’s activities, including intelligent interdisciplinary research (i.e. building on specific disciplines while drawing inspiration from outside those disciplines). At the same time, a journal could be a central part in the centre’s networking while also drawing international attention.

- In any case, strategic planning about the centre’s particular profile, or its niche in the academic landscape of Russian and Eurasian studies, must begin now, and it must involve the Director, the Research Directors, the academic staff, and the advisory board. Establishing a common goal and vision on this issue is vital.

Overall rating: not applicable.
Department of Peace and Conflict Research

**Strong areas of research**
Founded in the late 1960s, the department is firmly established internationally as a leading center of research in its field. It has at present the equivalent of 47 full-time positions and a budget of ca. SEK 50 million, of which slightly over half is external funding. The department offers an M.A. and PhD degree in peace research, but it is primarily a research unit. It has an impressive record of publications and internationally recognized researchers. Its data base (the Uppsala Conflict Data Program, UCDP) is unique. A rich data set on global armed conflict, it is widely used by researchers in academic institutions and international organizations, and generally considered to be of top quality.

The department’s research is focused on the causes of armed conflict, processes leading to peace (particularly negotiations), and post-war conditions for sustainable peace. Three major programs or research headings are currently operating. The group dealing with governance, conflict and peace building is addressing issues that are central in the field of peace building and democratic transitions such as electoral violence. A group working on negotiations has the potential to produce pioneering research in an area of both theoretical significance and policy relevance. As for causes of armed conflict – the department’s traditional focus of inquiry – other international research centers have in the past few years come to compete strongly with the Uppsala group. Work at the department in this area now focuses on environmental causes of conflict, including the policy-relevant issue of climate change. All groups have high, international publication records.

A newly added project that examines the causes of peace in East Asia represents a fresh departure and creates greater overall balance between the peace and the war components in the department’s research agenda. As a very large and complex project, it also poses challenges in terms of organizational integration.

The department appears to have struck a workable balance between diversity, group coherence and overall intellectual coherence in its research agenda. Coherence is also fostered by an emphasis on rigorous methodology, in particular quantitative methods and use of the data base (UCDP) for research.

The department has made academic publication a priority. The list of publications selected for this evaluation to represent “renewal of research” included 3 monographs, 2 edited books, 21 chapters in edited books and 11 journal articles. All but two items were published in 2011 or listed as ‘forthcoming’. Three of the articles were in top-rated international journals.

A publication list of this magnitude is an achievement for a department that also has teaching responsibilities. The success may be explained by several factors: adequate funding, organizational and intellectual coherence, careful recruiting, an organizational culture of ‘competitive collegiality’, as staff put it,
and a manageable teaching load. As a rough average, staff (permanent and temporary) estimated they spend one-quarter of their time on teaching.

The data base (UCDP) was identified in the previous evaluation (KoF07) as a potential flagship for the department. It is now truly filling the role of flagship. Updating and expansion has made it more comprehensive and richer in nuance. There is no comparable data set internationally in this area. As befits a flagship, the data base now has core funding from the Swedish government (SEK 3 million annually) to secure its basic function on a continuous basis. It is not sufficient, however, to upgrade, update and operate it as a truly first-class data base. The data base is top quality; some of the research at the department is of internationally high standard and some is internationally recognized.

Emerging science and potential for renewal

A strong organization with an ambitious output agenda also has its downsides. The emphasis on research and publication eats into the teaching responsibility. There may be a trend towards quantity rather than quality with regard to publications. The emphasis on methodological rigor still seems to favour use of quantitative methods, large N and data collection, with relatively less use of other methodologies (especially structured comparative case studies with a medium N) that could create greater diversity and richness in the methodological field. The same point was made in KoF07. It is indicative that the book on methodology in peace research produced this year by department staff emphasizes collection and evaluation of data, rather than methodology writ large.

Recruitment policies of PhD students and junior faculty have focused on internal recruitment. This has probably contributed to organizational coherence and effectiveness, but at the cost of diversity and in some conflict with the university-wide principle of internationalization. In the PhD program, for instance, it was estimated that the large majority – perhaps three-quarters – were recruited from the Master’s program in the department or from research assistants working in the data base program.

The department is heavily dependent on external funding for research. For much of the time since KoF07, more than half of its budget was externally generated. More recently the internal funding component has increased (last year by 27%), partly to compensate for an increased teaching load and to reflect publication merits. Heavy reliance on external funding remains a major concern, absorbs very considerable staff time in the writing of research applications, and constitutes an obstacle to long-term planning.

Evaluation of results of KoF07

The department has made good use of the principal findings of KoF07. That evaluation team identified the data program as a potential flagship, called for a more coherent research agenda, and recommended establishment of more postdoctoral positions to assure sustainable careers for the best students. As discussed above, the first two recommendations can be considered as imple-
mented. Regarding postdoctoral positions, the department received one of several such positions established by the university as a result of KoF07. The holder of that position is a promising and productive young scholar who has taken an active role in developing the research on peace building.

Recommendations

The department has recently expanded fast in terms of funding and staff. The present moment may therefore be a time for consolidation of organizational growth, accompanied by greater attention to priorities and the balance between coherence and diversity. In particular, we suggest the following:

• The department has the expertise, skills and talent to become a top-rated institute in its field and receive international recognition on par with the successful conflict data base. This potential could be developed further within the existing resource structure, e.g., through review of publication guidelines to encourage greater emphasis on fewer but quality publications rather than quantity.
• Additional core funding should be allocated to maintain, update and upgrade the Uppsala Conflict Data program, above and beyond its basic operating costs.
• Recruitment policies should be reviewed with a view to opening up the program for students of more diverse backgrounds and training in line with the university’s policy of increasing internationalization. For example, one possibility would be to open up the PhD program to participants from equally ranked sister institutions in other countries.
• Methodological approaches should be reviewed to explore greater synergies between quantitative and qualitative methods.

Overall rating: Internationally high standard.

Institute for Housing and Urban Research

Strong areas of research

IBF was founded in 1994 as a national multidisciplinary research resource focused on housing initially, and subsequently broadened to include urban studies. It comprises a thematic research institute with strong disciplinary roots, as demonstrated by its organisational structure focused on the four core disciplines of economics, geography, political science and sociology. In addition, three individual scholars contribute from the disciplines of anthropology, economic history and environmental psychology. Even if there are variations in the quality of research across the research groups we still find the research at IBF to be of an internationally high standard.
IBF is renowned within the international housing and urban studies community as a key hub of high quality research, comparable to other major and well-established units such as OTB in Delft and Urban Studies in Glasgow. IBF is unusually well-funded in terms of core grant monies, which gives it a significant competitive advantage with respect to the ability to undertake high quality, basic research and to make long-term commitments to sustained programs of study.

Another source of significant competitive advantage is the excellent and internationally unique resource which it has developed in the GeoSweden data-set. Some 10 years ago the institute started establishing this longitudinal data base consisting of all individuals who have resided in Sweden in any of the years between 1990 and 2008. The data base has information on, for example, national background, income, schooling and a precise description on location. A substantial part of the research that the human geographers engage in with respect to neighbourhoods and neighbourhood effects utilises this data base. This has produced results in the form of two completed dissertations and some more to follow and more than 10 articles in high ranking journals. It is impressive to observe that the Chair in Social and Economic Geography works regularly with the top researchers in the world in this field and at the same time has formed a group of highly promising young researchers (both PhD candidates and postdocs) within the institute. The latter has in part been made possible by the externally funded programme 'Dilemmas of Diversity' which the institute was awarded after fierce competition.

While having an important policy-applied role in the Swedish context as the primary source of academic expertise in the fields it covers, IBF has always been very outward looking and is extremely well networked within the international housing and urban studies community. It has made a crucial contribution to developing the international research infrastructure in the housing field in particular, initiating the European Network for Housing Research and playing an active role in most of the key international housing journals.

IBF pursues and publishes a range of high international standard research, most obviously in the field of segregation, social mix and neighbourhood effects where work of the very highest quality and international standing is produced. There is also excellent theoretical work undertaken on housing politics and policy, with particularly important contributions made in the areas of path dependence and normative theory. However, the retirement in a few years time of a key senior figure in this area represents a potential threat.

The group of economists at IBF has completely changed since KoF07. A new Chair in Housing and Urban Economics has been appointed. He has a very strong record of publications in journals such as Journal of Public Economics and Public Choice, as well as a very high level competence in econometrics. In addition the group consists of a senior lecturer, an assistant professor and three PhD candidates. This group needs a bit of time before they are firmly established, but is most certainly promising.
The sociology group is undertaking work in a range of interesting but very diverse areas. While they have made many theoretical contributions to the work of IBF, it may be worth considering whether they could apply their expertise also to social policy-related themes (e.g., public housing, homelessness, vulnerable groups, etc). Furthermore, they highlighted some new areas of promising urban research such as the relationship between animals and human beings. Moreover, a member of the “additional disciplines” emphasized the importance of the urban sociologists for the interactions within the institute and their contributions to the overall cross-disciplinary character of the institute. We should note that it is possible that we did not gain a fully rounded perspective on the work of this sociology group as some key staff was unable to attend the review meeting.

While a key strength of IBF lies in the rich mix of disciplines present within the institute, it seemed that much interdisciplinary cross-fertilisation within the institute has an informal flavour. Some IBF scholars – particularly the most senior staff – routinely engage in high status multidisciplinary research, but this is often with leading scholars from other institutions around the world, and not necessarily with IBF staff in other disciplines.

There appears to be a strong and vibrant research culture within IBF in which PhD students feel very welcomed and highly valued, albeit that in some cases staff members have primary loyalties to a ‘home’ department. The relationship between IBF and these ‘home’ departments did not seem as problematic as it may be with other research units within Uppsala, not least because the departments view IBF as providing a valuable ‘free good’ in the form of teaching and student supervision that eases the burden on the departmental staff. The move to Uppsala seems likely to strengthen the relationship between IBF and the departments, which will hopefully be to the benefit of both.

**Emerging science and potential for renewal**

There are a number of emerging and/or potential areas of work at IBF that we would suggest as particularly promising:

- Ethnic diversity, integration and segregation – this represents an exceptionally important and fruitful area of work that is both theoretically and policy-relevant, and has the great advantage of building naturally on existing strengths and uniting all disciplines across IBF.
- Utilisation of the GeoSweden data base is firmly rooted in the human geography group. It is now being utilised for other purposes also. The appointment of a research assistant who guides researchers in the use of the data base is a fruitful step in this regard. Register-based analysis of the reforms that have taken place within the Swedish housing allowance system is also a fruitful avenue of future research.
- The renewed strength of the economists group within IBF should be exploited to systematically develop work which crosses the boundaries of housing and urban economics.
• Avenues could be explored for developing the interface between housing and social policy at IBF, drawing in particular on the expertise of the sociologists and the political scientists at the institute.

• Environmental psychology – this represents a highly innovative area of work within IBF, seldom found within housing and urban research units, that seems to be enriching a wide range of areas of activity within the institute.

Evaluation of results of KoF07
The KoF07 evaluation panel noted that there was a need to develop the cross disciplinary dimension of research at IBF. In order to accomplish this, a new forum for cross disciplinary discussions has been set up. The panel acknowledges that multidisciplinary research should be firmly rooted in strong commitment also to the individual disciplines. KoF07 also recommended that the question of whether the location in Gävle was beneficial should be considered. The planning for a move to Uppsala is now entering the final stages. We see this as a wise choice, particularly as the institute will depend strongly on successful recruitment as the first cohort of IBF researchers enter into retirement.

Recommendations
• IBF has a long tradition of research into housing, housing markets and housing policy. While the shift towards more of an ‘urban’ focus in recent years seems strategically wise (particularly given the political context within Sweden), it is important for IBF to maintain a strong presence within the broad remit of housing studies. Thus it was encouraging to hear about the major bid on housing economics recently submitted. The panel recommends that the balance between these two fields of study is made a topic of strategic consideration at the institute level and not left to the individual researchers.

• Analysis of neighbourhoods, neighbourhood effects social mix and mobility based on GeoSweden would (and should) obviously continue to be a vital part of the research at IBF. At the same time, there needs to be an explicit awareness of the danger of allowing the research agenda to be overly influenced by data availability.

• As already stated, the economics group is in a process of revitalisation. The panel therefore thinks that there is an important opportunity for the Chair to take on a strategic role in the development of the whole group. This does not necessarily imply the research should be more thematically focused.

• There are a number of key people retiring in the relatively near future and succession planning is an urgent priority. This is crucial with respect to maintaining both the intellectual and strategic leadership within IBF. The very advantageous context within IBF for independent, sustained scholarship should help to attract a strong international field for senior positions. The move to Uppsala will be of considerable assistance in this regard.

Overall rating: Internationally high standard.
Panel 5

Scope of the panel’s evaluation:
Department of Psychology

Department of Psychology

Overview
The Department of Psychology at Uppsala University is among the strongest in Scandinavia. It contains some world-renowned research groups and publishes extensively, much of it in high status journals. It has a somewhat unusual profile, with two areas, developmental psychology and the psychology of emotion strongly represented, while many areas that would be regarded as important internationally are absent. The decision to focus strongly on one or two areas militate against diversity of topic and limits degree of synergy within the department. The major groups do however have multiple links and collaborations internationally, of which a good number are interdisciplinary. Outreach occurs through the clinical programme, and through the music group which is noteworthy for its contribution to music within the city and more widely.

The age distribution of the department is in process of change, with some new and younger appointments made recently, and a number of retirements likely to occur during the next few years. This presents an opportunity for planning a more balanced department, which should be taken. The gender profile represents a somewhat extreme version of that noted internationally, with 70% of PhD students being women, 50% of postdoctorals, 56% of researchers, 38% of senior lecturers, 25% of promoted professors and only 17% of chair professors. Two of the professors about to retire are women, which would leave the department with no female professors. There is clearly a need to attempt to redress this balance while maintaining academic standards.

General assessment of the research groups, and Quality of research
We will cover the various research areas in the order in which they were presented to us.

Development of action and social cognition in early infancy (otherwise known as the Baby Lab). – This is a large group comprising one professor, one senior professor, five PhDs, six PhD students, and one lab coordinator.

It is an outstanding group with a truly international reputation. It reflects the flair and ingenuity of its recently retired founder, and has developed highly sophisticated technology for studying babies and has used them imaginatively to answer a series of important theoretical questions. Its founder has deservedly
received a number of national and international awards for his research, and there must have been some anxiety about his replacement. Happily, it seems to have been resolved satisfactorily, and it is likely that the group will flourish, continuing current research topics but also developing them in new directions based on newly developed state-of-the-art equipment. We would regard this group as of the highest international quality.

**Developmental psychopathology.** – This large group (two professors, three PhDs, five PhD students) has done work of an internationally high standard, studying a range of children with psychological disabilities, using a longitudinal approach to investigate the nature and development of the relevant pathologies. The group publishes in top journals, and two of its students have won national prizes. Given the balance of the department, we would not suggest that new appointments necessarily continue this line, but would strongly recommend that, if the retiring professors are willing, the department should provide facilities that would allow them to complete the longitudinal studies.

**Organisation of human memory and the brain.** – This is a new topic (one PhD, one PhD student) and involves the only person we encountered who did not have contact with Uppsala prior to her appointment. She has valuable postdoctoral experience, collaborations with groups in both Sweden and Canada and impressed us with her enthusiasm and concern for her theoretically interesting projects. We noted that she only had two more years of guaranteed employment and was expected to fund her own research. Since this involves neuroimaging it is likely to be extremely expensive and difficult for someone at this stage of career to obtain funding. We strongly recommend that the department does everything it can to retain this researcher and that efforts are made to ensure that neuroimaging facilities are available within the university (see below).

**Human judgement and decision making.** – This group (one professor, three PhDs, three PhD students, one research assistant) is working on the topic of decision making, a classic area of research in Sweden and one that has become extremely popular internationally in recent years. Their work relies on both laboratory experiments and computational modelling. The signature of the group is to relate judgment and decision phenomena to broader areas of perception, categorization and memory and to ecological analyses of organism–environment relations. The extension of their future program to include studies of numerosity and also of links between economics and psychology are promising new directions. Their publications which appear in top journals of a large and highly competitive field are clearly of an internationally high standard, but in a large and very active field could probably not at this point be regarded as “world leading”.

**Music psychology.** – Unfortunately, presentation and discussion of this pro-
gramme (one professor, three PhD students) was limited by the absence of the relevant professor. Fortunately, our group contained a world expert on music psychology, and she was able to assure us that this group had a good international reputation for its work on music and emotion. We were however, unable to evaluate any plans for the future. This group appears to make a substantial contribution to outreach by organising public lectures, symposia and musical performances. On the limited information available we would regard it as being a group of internationally high standard.

**Emotion and facial expressions.** – This work (one professor, two PhDs, one PhD student) capitalises on an earlier demonstration by the relevant professor that measurement of facial musculature allows clear differentiation between different emotions, whether these are generated intentionally or automatically. Particularly exciting was the further observation that the movement of facial muscles can influence emotion, positively or negatively. This finding has had an impact on research worldwide. Subsequent research continues to be valuable, while not having quite the impact of the early work, suggesting that this group should currently be regarded as of international high standard, rather than continuing to be world leading.

**Stereotyping and prejudices.** – This is the only group (one PhD, one PhD student) in the department working in the important areas of social psychology and personality. It is a small group, not well resourced, but one that is taking an interesting and fruitful approach to research on stereotyping, a topic which elsewhere often tends to be rather stereotyped. At the current relatively early stage of the principal investigator’s career, it is probably too early to make a firm classification, but it is worth noting that there are already some good international collaborations. We feel that this is an example of a good scientist who is working well despite relative isolation, and would regard further appointments in this area as a high priority.

**Affective neuroscience.** – This is a top-quality group (two professors, 4–5 PhD students, and postdoctorals within the department and a similar number outside) that has done internationally highly rated research on gene–brain interaction, and which continues to be extremely productive. One of the professors is due to retire in a few years, but happily a new appointment has been made who seems likely to continue this area but with a slightly different emphasis on anxiety. This is particularly welcome since it seems likely to facilitate collaboration with other departmental members in the clinical field. We note however that although the group relies crucially on neuroimaging facilities (PET and MRI), they are dependent on the use of machines owned by the hospital. This means that work has all to be done out of normal working hours, when the equipment is not used for patients, and is furthermore, dependent on the excellent relations between this group and the hospital, where the person providing this essential
link is shortly to retire. This means that the university can no longer guarantee facilities for this highly important group, or for any further developments in this area of very considerable current worldwide interest. We find it somewhat surprising that a university of this quality does not have its own neuroimaging facility. We strongly recommend that a university neuroimaging centre be set up, to be used by psychology, psychiatry and other interested departments.

**Experimental intervention studies.** – This programme (one professor, six PhD students) has the laudable aim of evaluating evidence-based treatments of a range of psychological conditions. The professor concerned is enthusiastic, energetic and committed, but perhaps over ambitious in attempting to tackle too many different problems at the same time. This is an area that has developed to a point at which relatively substantial (and expensive) trials are required in order to provide satisfactory answers. Efforts should be continued to narrow down the focus and become involved in well-funded, probably multicentre trials. The work is already attracting some international interest and collaboration, but would benefit from a less ambitious more focused approach.

**Research environment and infrastructure**
The physical environment of the department is excellent, both in quantity of space and for the most part, in quality of equipment. The intellectual environment however is not so good. In particular, links between groups appear to be weak, even when they would appear to work in related areas, as in the several groups concerned with the study of emotion. There does not appear to be a system of internal talks whereby various groups could learn about each other’s activities.

A particularly important lack is that of support for junior researchers. If they are part of a strong group, then support from within that group appears to be excellent. However those outside appear to be expected to raise their own research funds, something that is difficult for a young researcher without a track record to do. Internationally, it would be the normal case that young staff members would automatically be assigned research space, some equipment and some scientific and mentoring support. Without this, they will find it hard to flourish.

Our impression is that postgraduate training is excellent, within the established groups, at least. We were able to meet a group of four PhD students who appeared to be lively, interactive and very satisfied with the department. We did however, wonder just how typical they might be, given that the gross time to PhD completion during the period 2005–2009 was 7.6 years, while the average for 2010 was 9.2 years, with age at completion being 39 and 44 years respectively. It is clear that the PhD system in Sweden has been very different from that found abroad and there may well be other extenuating factors. We understand that it is in process of change, but recommend that this issue be monitored carefully over the next few years.
Networks and collaborations

Stronger groups in particular have excellent networks of international and national contacts and collaborations. This is less so for the weaker groups, something that tends to lead to the strong becoming stronger and the weak weaker. This in turn leads to a very unbalanced department.

A related issue concerns the relationship between research and teaching. Internationally, it is assumed that university teachers should combine research and teaching, and should receive support for both. This does not appear to be the Swedish tradition; we understand that this is changing, but appears to be doing so rather slowly. Steps could be taken within the department to use available funds to help the newer and less strong groups, providing the possibility of their development into outstanding groups in the future.

Opportunities for renewal and emerging science

There are likely to be a number of retirements in the near future, coupled, we understand, with major national changes in the university funding system that will allow universities much more freedom to plan for future developments. It is essential that the department take this opportunity. Unfortunately however, there is little evidence of a broad strategic plan. The Head of Department and the coordinator of the visit are both new to the post, and are clearly aware of this need. It is less clear however that the senior members of the department are equally committed. We will return to this issue below.

More specifically, it is important to correct the extreme bias of the department in the direction of developmental psychology and emotion, which in most departments would probably occupy a relatively limited proportion of the areas covered. It is important to broaden the scope of the department at two levels, both in terms of senior appointments, and in terms of more junior appointments which should be accompanied by adequate research time and opportunities for achieving tenure. In terms of practical support, it would be valuable to have some technical support for incoming more junior faculty who are yet to achieve this on a grant basis.

Actions for successful development

This is a good department producing some world class research, but with a lack of balance both in terms of subjects considered, and also in terms of support for the staff. There are some outstanding groups that are well able to stand up for themselves and do an excellent job. It is however, difficult to see how new ideas will become established without some help and commitment from the department to broaden its remit, and to support new young researchers.

We were surprised at the extent to which the department appears to be dominated by its own alumni. Only one out of 40 teaching staff was previously not linked to the department at an undergraduate or PhD level, and frequently both. We suggest that in the future, open positions be widely announced internationally. Uppsala’s strong reputation would be expected to attract outstanding...
ing applicants. This would be advantageous especially if the department seeks to provide a more evenly balanced distribution of areas of research and teaching, as we recommend in this report.

We were pleased to note that a start had already been made in the direction of rectifying this, with the appointment of a young scientist, who adds the study of memory to existing strengths, and already has excellent collaborations both within Sweden and with North America. It is however important to back up such appointments, both in terms of facilities, and to avoid isolation by making judicious further appointments. These should not aim to be in exactly the same area, but be sufficiently close as to be supportive, and ideally perhaps to link to other strengths within the department. We understand that the two-class system of teachers and researchers that previously developed in Sweden is in the process of change in the direction of making appointments comparable to Assistant Professor. We regard this as desirable from both a research and educational viewpoint as it would mean a greater institutional commitment to younger faculty and add a research perspective to student instruction.

**Effects of the KoF07-evaluation**
The recommended improvement in physical environment and laboratories has been achieved, resulting in excellent facilities. The urgent issue of academic succession in the Baby Lab and Affective Neuroscience Group have been completed successfully. Although in both cases the appointments are from within the group, individuals of very high quality were appointed who seem likely to maintain existing excellence while broadening into new areas. The suggested development of a strategic plan for the future does not appear to have made any obvious progress.

**Other issues**
While we were in general impressed by the research within the department, two things concerned us. The first of these was the degree of concentration of resources onto a few areas. In terms of expansion, we would probably all give slightly different emphases, but would agree on the importance of basic areas such as the psychology of language, of perception, of memory and attention, of personality, of life span and aging, of functional impairments together with a range of applied studies that could broadly be categorised as the psychology of work. A strong research department must of course specialise on a subsample of these areas, but relying on one or two areas is dangerous. Even the most exciting topics run into fallow periods when they become relatively unproductive, while funding agencies are always in danger of a change in governmental priorities. A broad based department is likely to be much more able to withstand such lean years.

A second feature that concerned us was the related question of combining research with teaching. We understand that the two-class system of teachers and researchers that previously developed in Sweden is in the process of change.
We regard this as desirable from both a research and educational viewpoint. It is however, difficult to avoid if a large proportion of the research within the department is narrowly concentrated, leaving the rest of the syllabus, to teachers with little research expertise.

We accept that some of these problems are inherent in the traditional Swedish university system, and are not easy to change. For that reason, we are concerned at the apparent inability of the department since KoF07 to develop a coherent plan. A tradition within the department of having a non-professorial head may work very well in stable times, but presents a problem in developing departmental scientific leadership, resulting in the observed tendency to build on existing strengths rather than developing new directions. The next few years are going to be crucial, both in terms of retirements within the department and of national changes to the university system. We suggest that the university should consider a part-time limited term appointment of an outside head of strategy, someone who combines a strong research record in psychology with experience within the university system who can help coordinate and focus opinion within the department, and optimise its interactions both within and beyond the university.

Conclusion
We have concentrated on one or two points of weakness within what we regard as a very strong department. Its top research groups are of genuine world class, with many other researchers just below this standard. We believe that the opportunities for new appointments and for greater flexibility within the Swedish system will put it in the position to become an even better department, given adequate planning and good scientific leadership.
Panel 6

Scope of the panel's evaluation:
Department of English
Department of Linguistics and Philology
Department of Modern Languages
Department of Scandinavian Languages

Introductory remarks
Panel 6 has formed a generally very favourable impression of the departments of languages at Uppsala that we visited, with its great diversity and unique range of languages and literatures studied. Much good research, often reaching an internationally high standard and in many cases of top-quality and world-leading, is carried out in the units we have surveyed. Because of the energy, enthusiasm and dedication of individual researchers and groups, impressive results are reached in spite of sometimes inadequate funding.

Organization of this report
To facilitate comparison, this report lists the departments and units in the same order as that of KoF07, but in the diverse departments of Linguistics and Philology and Modern Languages each sub-unit is evaluated separately, for easy reference. This will necessarily lead to a certain imbalance, with more space devoted to those departments than to the more homogeneous ones of English and Scandinavian languages; however, this should in no way be seen as an evaluation of the importance of those departments.

Not every heading has been included in all reviews of departments or sub-units, as they are covered in this Introduction or under other headings.

Teaching
Compared with other countries, there is an imbalance between the relatively light teaching load of program professors at the undergraduate level and the heavier one of promoted professors. We realize that these differences have to do with the allocation of funding and the greater administrative duties of program professors, but we consider it to be detrimental to sustained research activity by promoted professors, especially in smaller departments.

Graduate study
We found a high degree of satisfaction with the current organization and funding of graduate studies in almost all departments. The system and the way it is operated by the departments obviously attracts many students from outside Sweden. The practice of some departments of providing seed money to support
funding applications for new PhDs is laudable and should be adopted wherever possible and supported by the Faculty and the university.

Dissemination of research
Although it is important to publish in the languages and literatures under study, and essential that Swedish scholars be able to discuss and describe their research in their mother tongue, we wish to stress the importance of publishing in internationally recognized journals and series, and in the case of monographs, with leading presses, and producing adequate summaries in English when that is not the language of publication. This will strengthen the dissemination and evaluation of research at Uppsala University.

We also highly recommend the procedure of the Department of English, notably used by the English Linguistics unit, whereby many doctoral dissertations are presented in a manuscript version for the defense, and where constructive criticism can be incorporated into a final version (or articles based on it) submitted for publication by an international publisher. We recommend this strategy for other departments as well.

However, even with such measures, current bibliometric models are not always adequate for assessing the quality and quantity of work done in the departments of linguistics and literatures. We recommend adapting bibliometric methods so that they can do justice to the publication culture of the humanities. A good way to go appears to be the system adopted in Denmark, Den bibliometriske forskningsindikator.

General recommendations
We recommend continuation of the ongoing dialogues between departments within the faculties of Humanities and Arts in view of the high importance of the study of literature, which we see as indissolubly linked to the study of languages.

The panel recognizes the need continually to rethink the structure of research and teaching in the Humanities, taking into account the relative size and vulnerability of some subject areas.

We applaud Uppsala University’s endeavors to sustain long-standing fields of study and to encourage new developments, but more financial support for research, as well as expertise concerning the application for EU grants, must be supplied by the university if standards are to be upheld.

The languages listed as national responsibilities should also receive added funding.
Department of English

General assessment of the department
Research in English is undertaken in three distinct areas: English Linguistics, English Literature, and American Literature. Following a Faculty decision in 2007, Celtic Studies became a minor subject (“biämne”) which means that new students cannot be admitted to a PhD program in Celtic Studies.

The department has gone through a period of transition, but the panel noted with pleasure the appointment of two Chairs, in American and in English Literature, the latter only this year. These appointments should enable research in literature to move forward. We discussed with the new Chairs and their colleagues ways in which they might move beyond the present situation where some good work is being produced on an individual basis, and noted plans for future conferences and research seminars.

We were encouraged by the meeting with colleagues and with PhD students, which showed a small group of people with commitment, energy and wide-ranging intellectual curiosity. This is a department fired with enthusiasm for individual research projects, in the case of the two Literature sections, and working extremely well in the case of Linguistics.

We were particularly impressed by the publishing strategy for doctoral dissertations pioneered by English Linguistics and recommend that this be followed by the department as a whole to enhance their international profile.

Quality of research
Research in English Linguistics is largely based on computerized historical corpora and is of a high international standard, reaching top-quality in many cases, with works published by renowned international presses. The current addition of a research scholar with external funding testifies to the strength of the English Linguistics section.

Given the hiatus when the two Chairs were vacant, both American and English Literature sections have made promising progress since KoF07 but are yet to establish clearly identifiable lines of research beyond individual publications, some of which are highly regarded and of internationally recognized standard.

Research environment and infrastructure
Staff and graduate students appeared wholly satisfied with library resources, office space, and IT provision. The presence of a Fulbright Chair provides the department with additional opportunities for teaching and research contacts.

Networks and collaborations
There is strong networking especially in English Linguistics, where the Chair is the Secretary of the ICAME Board, the International Computer Archive of Modern and Medieval English, whose annual conferences are attended by senior as well as junior researchers. The English Linguistics unit also collaborates...
with top-ranking departments and scholars in countries such as England and the United States on corpus development as well as research and publications.

The Swedish Institute of North American Studies, SINAS, is a great asset to the American side of the department.

The stated aim of the English Literature section in the 2011 documentation is to move from a philological model of literary studies to a cultural and historicist model, and with the arrival of the new Chair establishing collaborative networks appears promising. We discussed possible collaboration with Comparative Literature and with other language and literature departments, and noted the willingness to engage in such conversations. The small number of researchers in English Literature especially means that collaboration is likely to be a significant way of enhancing bids for research funding in the future.

**Opportunities for renewal**

We discussed the question of nomenclature, since much of the research being undertaken is neither American nor English; there is expertise in African Literature in particular, and in other literatures in English. One possibility might be to rename the Chair in English Literature as the Chair in English Literatures, which would better reflect not only the research being undertaken at Uppsala but also the global shift towards the study of Literatures in English. The chair in American literature should be continued in close collaboration with SINAS.

**Actions for successful development**

The two Literature sections have an excellent opportunity to develop new lines of research, though care will need to be taken to delineate those links with a clear focus, so that literary studies in English at Uppsala might acquire a recognizable international identity. The English Linguistics unit must receive continued support to maintain its world-leading status.

**Effects of the KoF07-evaluation**

The two Chairs of literature have now been appointed.

**Department of Linguistics and Philology**

**General assessment of the department**

This diverse and wide-ranging department is working smoothly under efficient and enlightened leadership, and we found a vibrant atmosphere and great enthusiasm in all the units surveyed by our panel.


Turkic and Iranian Languages

General assessment of the unit
During the last forty years, following scholarly and societal trends, scholarship in Iranian and Turkic Studies has increasingly applied literary and linguistic theories and tools, with focus on the pre-modern and present periods. Uppsala University is one of the few instructional research institutions that supports both Iranian and Turkic studies, and thanks to the leadership of the heads of these two sub-units at Uppsala, the unit is outstanding not only in Scandinavia but worldwide. In the European setting, Uppsala is one of the leading research centers.

Quality of research
Both heads of the Iranian and Turkic languages units at Uppsala continue to be very productive in a wide variety of subfields and disciplines, with focus on linguistics in the most comprehensive sense of the term. Areas of both include corpus-based research, language contacts, and endangered languages, and application of IT in teaching Turkic (all with the application of linguistic theories, phonology, syntax, semantics), and uniquely prominent philological work.

The panel recognizes that the unit, with professors and other research staff, well exemplifies the leading trends in their fields, publications and international networking. The quality of their research is of internationally high standard, often of top-quality.

Research environment and infrastructure
The library services are considered adequate. However, a good number of basic research tools, including reference works in the less focal areas, such as Pashto, need to be made available.

Networks and collaborations
As observed in KoF07, a comprehensive synergy with other sections is a distinct feature of these two sub-units. Moreover, the collaboration between Turkic Languages and Computational Linguistics has now shifted its focus to corpus linguistics comparing Iranian, South-Asian and Turkic languages with Swedish and English.

The very productive international cooperation between Uppsala scholars and international scholars in Iranian and Turkic studies continues. Both chairs continue to be leading their fields in organizing international conferences in Persian/Iranian and Turkic linguistics, or both fields combined. Both are members of the editorial board of Orientalia Suecana, a journal of the highest international recognition. The unit also participates in the Urban Mind project (combined humanities and natural science studies of the development of urbanism and climate change in the Middle East).

Activities also include the organization of a symposium by the Turkic Lan-
guages sub-unit, jointly with Iranian scholars in Istanbul, and the *Fourth International Conference on Iranian Linguistics* in Uppsala. Iranian scholars also participate in a number of projects on Irano-Turkic languages (such as Kashkay), and publications in comprehensive volumes.

**Effects of the KoF07-evaluation**

**Turkic Languages.** – Overall the sub-unit is very satisfied with the present situation, and expects the university to support the very positive development of their subject area also in the future. The staff has been extended by a senior lecturer in Turkic Languages, docent since May 2011, and the number of PhD students has gone up to three from one in 2007. Recognizing the need to strengthen the cultural aspects, more Turkic literary studies have been initiated.

**Iranian Languages.** – As a result of KoF07, some limited resources were allocated, which nevertheless enabled the sub-unit to initiate work on the Balochi dictionary and to employ a couple of researchers for a few months. During the same time, a number of important projects could be initiated (Swedish Research Council projects, language documentations; sociolinguistic surveys, text editions and translation).

The statement in KoF07 that one Chair mainly focuses on Balochi needs to be modified; her recent research and publications include research on Persian linguistics and she was offered the general editorship of “PERSIAN” for the *Encyclopaedia Iranica*.

**Actions for successful development**

Iranian Languages does not have a Chair in Persian literature. Given the centrality of this vast literature for cultural studies, and the dominance of the 1000 years of Persian Literature in the Islamic Irano-Turkic cultural complex, the committee strongly recommends the establishment of a Chair in this field.

**Other issues**

In a globalized world, the coverage of near-Eastern and other Asian languages is of the highest relevance for society.

**Linguistics and Swahili**

**General assessment of the unit**

The Chair in General Linguistics at the DLP was established a decade ago, and the unit has developed very positively since 2007. In addition to the Chair, there are three promoted professors (one in Swahili), one senior lecturer, one junior lecturer (in Swahili), one researcher and six PhD students. Five PhD students have graduated in general linguistics since 2006. The study of Swahili is an integrated part of General Linguistics. The units are happy about the or-
ganization, and the panel finds that it is working well. The unit is involved in a wide variety of research areas and topics within general linguistics, such as lexical typology, the typology of verbal semantic fields, language documentation, dialect classification in the Himalayas, second language acquisition, Swahili, and other African languages. The unit has initiated and developed several important language corpora tied to the main focal research areas. A senior lecturer in phonetics has also been recruited since 2007.

Quality of research
The panel finds most of the research to be of a high international standard and notes that the unit has an excellent record of publishing internationally.

Research environment and infrastructure
Adequate.

Networks and collaborations
There is widespread, international collaboration with, e.g., the Max Planck Institute in Leipzig and several German universities, several universities in India and one in Australia, and in Sweden with Lund and Stockholm. There is also collaboration with the Faculty of Medicine on speech and language pathology.

Opportunities for renewal and emerging science, and Actions for successful development
The panel suggests that research cooperation be extended also to other units of the DLP and that the obviously very fruitful cooperation between Turkic and Iranian languages can serve as a model.

Effects of the KoF07-evaluation
Although limited, funding has had good effects, for instance as regards the ongoing documentation of Asian languages.

Other issues
The unit’s research activities have high degree of relevance for society; second-language learning and language acquisition are key areas, and the publication of Swahili dictionaries and a Swedish grammar are important examples, and so is the collaboration with the Faculty of Medicine concerning speech and language pathology.

Computational Linguistics

General assessment of the unit
Computational Linguistics is inherently a multi-disciplinary science, combining linguistics, computer science, and cognitive science aspects. The CL group cur-
rently has sufficient critical mass to fulfil its research goals. The staff is balanced with respect to age, gender, rank and research interests, is productive, and successful in attracting external research funding. There are various joint projects with other groups within the department and outside.

**Quality of research**

The computational linguistics group has a strong interdisciplinary profile in the highly competitive area of empirical methods for Natural Language Processing, most notably multilinguality (machine translation) and statistical parsing (especially dependency parsing), and is at the same time also active in the development of tools and resources (most notably the MALT parser, Uplug, OPUS and the Swedish Treebank) and the organization of high-impact "shared tasks".

We grade the quality of the research as top-quality, world-leading (the program chair Joakim Nivre is in the top 5% most cited computational linguists and the MALT parser is one of the most prominent tools in the field). It is a relatively small (< 20) but extremely productive group, with an impact comparable to that of some of the best CL groups in USA at Berkeley and MIT.

**Research environment and infrastructure**

The group has succeeded in creating an excellent environment for top level research. Because of the predominantly statistical and computer science approaches taken, the group could just as well be part of a computer science department, but its current embedding in Linguistics and Philology is to everyone’s satisfaction.

**Networks and collaborations**

The CL group has an extensive national and international network as witnessed by a predominance of joint papers with external research groups, and high mobility of researchers.

**Opportunities for renewal and emerging science**

Given the large impact of the current research directions and strategy, the most reasonable advice is to keep working in the same direction. The group can play an important role in the proposed Uppsala Language Documentation program, which would put to use the expertise of the group for the whole department even more than is currently the case. It would also provide new research challenges for the CL group.

**Actions for successful development**

The university management should take into account the specific computing support needed by this group. A more general problem is the lack of support for budget matching in European projects where this is required.

Although the group is doing extremely well in terms of impact of research, current critical mass is in danger of eroding when the three-year appointment
of the visiting professor (responsible for a large part of the work on multilinguality) expires and when the externally funded PhDs are not replaced. The panel recommends adding another permanent position or at least extending the practice of hiring visiting professors.

Effects of the KoF07-evaluation
The visiting professor allocated to the group has successfully led to more critical mass, and a larger scope of research activities.

Chinese

General assessment of the unit
The unit is small and has one promoted professor and one senior lecturer with widely different specializations: the sociolinguistic study of minority languages in China, especially Miao, on the one hand, and Chinese classical literature and cultural studies on the other. There is no research concerning Chinese linguistics, and so far, no graduate program. Such a program is planned but will require strengthening the language study at the undergraduate level.

Quality of research
The research in the unit is of internationally recognized standard.

Infrastructure, networks and collaborations
The infrastructure is considered generally adequate. There is lively collaboration with Minzu University in Beijing and the Communication University of China; at Uppsala there is collaboration with the Departments of Informatics and Media and English for upcoming conferences.

Opportunities for renewal and emerging science, and Actions for successful development
The panel recommends collaboration with researchers in departments studying the situation of minority languages in countries other than China. Chinese linguistics needs to be given more weight in the unit. The existence of Chinese studies programs requires that research is strengthened by Chinese linguistics.

Effects of the KoF07-evaluation
Whether or not this is a result of the earlier evaluation, where Chinese studies were not even commented on, there is now lively research going on in this unit.

Other issues
Given the rapidly growing role of China in the world, the publication of popular articles on its language and culture is highly commendable, and the department fulfills this important mission very well.
Department of Modern Languages

This department now appears to be working well, with good collaboration between its different parts, and unity and overview manifested in two-day joint retreats with presentations of individual projects, as well as joint seminars.

Slavic Studies

General assessment of the unit
The Slavic Studies unit has one chair in Slavic languages, two professorships in Russian language, and one in Polish literature; two senior lecturers; one postdoctoral fellow; and ten PhD candidates. The unit is unique in Sweden in focusing its research mostly on traditional diachronic Slavic linguistics and philology, covering a broad spectrum that includes studies of medieval Church Slavonic manuscripts and Church Slavonic translations of Greek hagiographies, vernacular Old Russian birchbark manuscripts, and Early Modern Russian books and newspaper translations. Synchronic linguistics research is represented by sociolinguistic studies of Bosnian/Croatian/Serbian, and issues of Bulgarian syntax. There is only one literature specialist in the unit, investigating modern Polish literature with special emphasis on gender issues; otherwise, the unit members are all linguists or philologists. Languages taught in the unit are Old Church Slavonic, Old Russian, and contemporary standard Russian, Bosnian/Croatian/Serbian, Bulgarian, Polish, and a non-Slavic language, viz. Albanian, for which Uppsala has been assigned the national responsibility. The other West Slavic languages are taught and researched at Stockholm University under an agreement between the two institutions.

There is a certain lopsidedness as far as literature and linguistics is concerned. The department is strong in historical linguistics and philology, but literature is essentially present for Polish only, and the publications in this area are mainly intended for a general public.

Quality of research
The strength of the unit lies undoubtedly in historical linguistics, with special emphasis on the philological work with manuscripts. In this field the unit is a major center outside the Slavic-speaking countries whose research can be rated as being of internationally high standard, reaching top-quality in some areas. The other research areas in the unit are less important as far as the output is concerned; the scholarly publications often reach internationally recognized standard.

Research environment and infrastructure
The members of the unit appear generally satisfied with the research environment, particularly the availability of Russian manuscripts at the University library, which also has an extensive collection of books in Slavic studies.
Networks and collaborations
There is a joint project with Slavic scholars from Uppsala, Stockholm, Gothenburg, and Umeå universities to digitize and describe all Slavic manuscripts kept in Swedish libraries and archives. The project, which is funded by the Swedish Research Council, performs an important service both nationally and internationally by identifying and making available to scholars facsimiles of these manuscript materials. There is also collaboration with the Russian Language Institute of the Russian Academy of Sciences to publish 17th-century handwritten Russian translations of Dutch newspapers. The present chair has been a participant in a joint Finnish/Macedonian research team whose work culminated in a highly-respected annotated edition and analysis of the important 19th-century Konikovo Gospel manuscript, which was written in vernacular Macedonian and Greek parallel texts.

Because the Slavic Studies unit’s research focuses to a great extent on diachronic linguistic and textological studies of Old Church Slavonic and pre-contemporary periods of Russian, its primary interdepartmental connections are with the Greek and Byzantine unit of the Department of Linguistics and Philology. With respect to modern Bosnian/Croatian/Serbian, there is collaboration with the Hugo Valentin Centre for ethnic studies and the Uppsala Centre for Russian and Eurasian Studies.

Opportunities for renewal and emerging science
Through the hire of the new unit Chair and a new lecturer, the unit has renewed its teaching and research focus on Bosnian/Croatian/Serbian, one of the major minority languages of Sweden and one of the national priority languages. Albanian language study has been introduced, and research activities now include modern Albanian.

Effects of the KoF07-evaluation and Actions for successful development
Many publications within the unit still are “intra-Swedish”, i.e., written in Swedish for Swedish venues, and thus less likely to attract the attention of the international Slavic studies community. However, the unit has followed the 2007 recommendation that the Faculty of Languages make its research more visible internationally by turning its in-house journal Slovo into a peer-reviewed online journal with external reviewers and a much broader international readership than before. The journal is now inviting a guest contributor from outside Sweden for each issue, is putting out an international call for submissions, and is announcing each new issue on international Slavic studies e-lists.

However, the managing and editorial work relating to Slovo is done nearly single-handedly by a graduate student. It would be desirable that more members of the unit take on some of the editing responsibilities in order to relieve the graduate student editor of some of this great time burden.
Other issues
The doctoral training is strong, but the time to complete the dissertation within the four-year funding period is a serious issue for PhD students who also serve as the sole instructors of language courses. Thus for example one PhD student has sole responsibility for running the Bulgarian language program and teaching Bulgarian on all levels.

Research on sociolinguistic aspects of Bosnian/Croatian/Serbian is highly relevant in today’s Europe. Here the outside view is particularly important since in the language area itself such questions are highly politicized. This has immediate repercussions on Sweden since Bosnian/Croatian/Serbian is one of the major minority languages in this country. Historical linguistics and philology contributes to a better understanding of the cultural background of the orthodox Slavic world.

Finno-Ugric Languages

General assessment of the unit
The unit of Finno-Ugric languages is the smallest, but linguistically the most diverse, in the Department of Modern Languages. In Sweden, Uppsala University has the main responsibility to ensure successful research in contemporary Finno-Ugric studies, which is important for the study of language diversity and migrant groups in Sweden and in the northern Baltic Sea area. The main emphasis is on Saami, Finnish, Estonian and Hungarian, which represent the westernmost varieties, as well as those geographically most adjacent to Sweden. During the past twenty years, a rapid change has taken place in the circumstances in which these languages are spoken, and this affects the research concerning them.

On the one hand, traditionally important fields in the research of the Finno-Ugric languages, such as historical linguistics and the development of early written varieties, need to be fostered. On the other hand sociolinguistic change in language communities, multilingualism and mobility across traditional language boundaries make it necessary for linguists to apply and develop appropriate contemporary methods.

The research in this unit relies heavily on the output of individual scholars, and there is less teamwork based on shared focal areas and joint projects. The research on Estonian has a clearly leading position and is internationally acknowledged. The long tradition of research on the Saami language is continued, but research in Finnish, Hungarian and comparative Finno-Ugric would benefit from new initiatives.

Quality of research
The research on the Estonian language, migrant Estonian communities in Sweden and other countries and development of written Estonian is top-quality.
The holistic approach to the dynamics of expatriate communities is supported by an accurate analysis of context as well as historical processes. The research of Saami language attains an internationally high standard and an innovative dissertation concerning the deciphering and analysis of early written texts in Saami was defended during the period of evaluation. The general level of research is internationally recognized.

**Research environment and infrastructure**
The library services and technical infrastructure are excellent and permit high-level research.

**Networks and collaborations**
The Finno-Ugric unit has participated in two international interdisciplinary projects, of which one has focused on Prehistoric Networking in Northern Fennoscandia and the other on the Baltic countries during the first centuries of the modern era. There are other projects in which the expertise of Estonian language and migrant communities contributes in international networks. Networking and joint projects mainly focus on the Baltic Sea area. More active creation and participation in various networks across department borders and in an international context would benefit doctoral programs and the diversity of research into Finno-Ugric languages.

**Opportunities for renewal and emerging science, and Actions for successful development**
The research and teaching of Finno-Ugric languages at Uppsala University is in a state of transition. There are strong fields of research and an acknowledged tradition that can be further strengthened by enhancing the presence of internationally recognized research of Finnish and Hungarian in the unit, both being important migrant languages of Sweden. This could take place in collaboration with the Department of Scandinavian Languages and the Hugo Valentin Centre. Networking with other departments would enhance the efficiency of the doctoral programs. Language documentation could also be a fruitful area of collaboration with the department of Linguistics and Philology. The older manuscripts of written Saami at the University library are unique and have not yet been fully exploited; digitalization and critical editing of those would be important for the research of the history of Scandinavia in the 17th and 18th centuries in a considerably larger perspective.

**Other issues**
Given contemporary demographics, Finno-Ugric studies are obviously of the utmost importance and have a high relevance for society in Sweden and the whole Baltic area.
German Linguistics and Literature

General assessment of the unit
The unit has strong individual researchers with great enthusiasm for the research of the unit and the whole department. During the period of scrutiny, the fields of research have been both more sharply focussed and co-ordinated. The current research activities reflect two main goals: (i) The application of new theoretical and methodological perspectives in modern as well as historical linguistics. This shared approach secures and strengthens the collaboration between these research fields, and (ii) in literary studies, focus on narratology and intertextuality.

The dialogue and interdisciplinary collaboration between researchers in historical linguistics, modern linguistics and German literature is unique among Swedish departments/units of German. The quantity and quality of the output of the unit are high, and in terms of quality and innovation of research the group compares well with those at leading German universities. The department has also been successful in getting external financing in the period under scrutiny (one PhD student, two researchers with external funding, and funding for planning of one project).

Quality of research
The research of the unit attains an internationally high standard. The unit holds a leading position in introducing new methods and theoretical perspectives in cultural studies, connecting research on language, literature and communication. Cultural analysis method and theory could offer opportunities for renewal not only in the unit but also in the whole Department of Modern Languages.

Research environment and infrastructure
Generally the unit considers its infrastructure adequate. The editorial board and subeditors for Studia Neophilologica and Moderna Språk, the most important journals for language and literature in Sweden, are part of the unit.

Networks and collaboration
The unit has extensive interdisciplinary and international contacts and its members are part of scholarly and other networks (the Hugo Valentin Centre, Forum for German Studies, Goethe-Institut). The project “Contrasting gender change” connects to Faculty projects concerning language typology. The unit organizes workshops for creating synergies in research, such as doctoral training in collaboration with the PhD-program at Stockholm University and the universities of Mannheim, Gießen, Münster and Marburg. International co-supervising has also been implemented.

In the period of scrutiny interdisciplinary conferences and workshops have been arranged on perspectives on racism and migration as a concept for analysing Swedish and German realities, translation, and languages in 17th century...
Sweden. There is interdisciplinary and international collaboration on *A German-Swedish-Polish-Latvian Dictionary* from 1705, and the unit is also represented in the interdisciplinary Faculty project “Language and aging”.

**Opportunities for renewal and emerging science**

In linguistics the historical research perspective will be further developed within the context of modern linguistic theory and methodology (electronic text editions). There is also an ambition to strengthen the integrative approach in language and literature with a cultural studies perspective. Doctoral students are participating in faculty projects such as gender research and the 17th century.

**Actions for successful development**

Although the research of the group is qualitatively on a par with groups at top-ranking departments in Germany, there is a lack of resources in terms of research time and number of researchers. This is partly overcome by collaboration with other researchers, but an additional Chair in German literature would strengthen the department and secure doctoral research.

**Effects of the KoF07-evaluation**

The recommendations of KoF07 have been fully implemented. The intensive collaboration in national and international networks will strengthen the further development of the unit and will also benefit the whole department.

**Other issues**

Ongoing work on language and aging (especially senile dementia) is highly relevant in today’s society, and so is research on language-based practices in the field of late pregnancy and giving birth. The focus on cultural analysis provides insights into the workings of contemporary German society.

**Romance Languages**

**General assessment of the unit**

The dominant research focus within the Romance Languages unit is still modern French linguistics, focusing on two interrelated fields: (i) modality and evidentiality, and (ii) argumentation and discourse relations. These projects are carried out collaboratively with Spanish linguistics, which has had a synergic effect on the development of research in that field. Romance literature suffers from the lack of a Chair but excellent research is developing that deals primarily with 19th century drama, enabling analytical bridge-building between literature and theatre studies. The personnel structure is well calibrated, and there is an excellent spirit of collaboration between all categories of staff; junior researchers are well taken care of and integrated into the unit.
Quality of research
The unit has a very long tradition within modern French linguistics, combining theoretical and empirical analyses. Studies of modality and evidentiality must now be characterized as being of top-quality, at the cutting edge of research in these areas. These studies are regularly published in the leading French journals, and research in Spanish linguistics similarly attains a high international standard. The unit’s literature studies are also internationally recognized.

Research environment and infrastructure
The researchers were also satisfied with the technical assistance they were provided with. Seminars that gather together all the activities of the unit are organized on a regular basis and are generally attended by most of the staff.

Networks and collaborations
Cooperation within the unit works well, and within French linguistics there is close collaboration with important universities in the research community, in particular with the universities of Bergen and Paris X. We believe that these contacts could serve as a motor for Spanish linguistics and literary studies in developing their existing network activities to a higher degree than has previously been the case. A joint project involving French, Italian, Spanish and German literatures is promising.

Opportunities for renewal and emerging science
The outstanding research in French linguistics merits attention from a wider linguistic community, and we strongly recommend a greater degree of publication in English. This applies to all the researchers of the unit. We also recommend that French linguistics profit from their international position to broaden their research to neighboring areas. More collaboration with other departments within the Faculty, especially the Department of Scandinavian Languages and the Department of Linguistics and Philology, might also strengthen their research in contrastive and comparative linguistics.

French, Spanish and Italian Literature should especially consider involving the Department of Scandinavian Languages, but also the Department of Comparative Literature, in their project dealing with translations and cultural transfers.

Actions for successful development
French linguistics may serve as a motor for development and renewal in the unit. We strongly recommend that a Chair in French literature should be allocated in order to ensure that the former high level of this discipline at Uppsala University is re-established.

Effects of the KoF07-evaluation
The new appointment of a Chair in Romance languages, especially French, has
strengthened the unit considerably and the resources allocated have presented the opportunity of attaining critical mass.

**Other issues**

We observe with pleasure that research at the unit has contributed to creating better French grammar manuals to be used in the Swedish education system.

**Department of Scandinavian Languages**

**General assessment of the department**

The department has four Chair positions, mainly devoted to sociolinguistics, onomastics, text research and stylistics, and runology, respectively. (Onomastics and runology are dealt with in the report of Panel 7.) The existence of these Chairs signifies both the existence of certain focal points and the broad scope and varied perspectives of the department’s research.

The department stressed its intention to continue its broad approach in spite of the recommendation of KoF07 to focus more on specific fields and topics. The present panel wholeheartedly supports the department in its ambition to maintain its wide research perspective. The definitions of the four Chairs nevertheless point to certain core areas, and the panel finds that to be a good way to cover focal areas as well as a wide approach.

In addition, the department is one of the very few Scandinavian departments in the Nordic countries that has succeeded in continuing the old philological tradition and combining it with both theoretical and methodological development and renewal, especially perhaps as regards sociolinguistics and text analysis, where this department has a leading role in Scandinavia. In addition to covering the more basic research areas, the department has also successfully embarked on more applied areas, especially concerning language in the schools, where the department has undertaken a huge project regarding the national language tests. Several PhD dissertations have been written within this project.

It should also be mentioned that the department is the only one in Sweden that still has native speakers teaching in all the Scandinavian languages.

**Quality of research**

The panel finds that the department’s research is of a high international standard, and top-quality especially in the areas of the chairs.

**Research environment and infrastructure**

Library and computer facilities are considered good, but there is a lack of office space. The department’s PhD students expressed general satisfaction with their
situation, and the department’s number of graduate PhD candidates since 2007 is impressive.

**Networks and collaborations**
The department cooperates with the English department in building a promising corpus of historical drama dialogues.

**Opportunities for renewal**
Since two of the Chair holders will retire in the near future, there could have been a new orientation of the department’s focus and research strategy but the department has decided to continue and even extend its broad approach by widening the description of one of the vacant chairs from “Modern Swedish” to just “Swedish”. The panel supports this decision and finds it to be in keeping with the department’s general philosophy of being a complete Scandinavian department.

One area in which the department wishes to increase its competence is Swedish grammar, and new faculty members have improved the situation in this field.

**Actions for successful development**
The panel suggests that the department increase its focus on international publications. The cooperation with the English department may produce new opportunities here.

**Other issues**
The department has a long and continuing impressive tradition of outreach through the various media, newspapers and magazines, radio and TV. The above-mentioned project on language in the schools and national testing is of major importance for Swedish society and education. The study of immigrants’ language in workplaces should also be mentioned here.
Scope of the panel's evaluation:
Department of Linguistics and Philology
Department of Scandinavian Languages

Introductory remarks
The visit of the various units dealing with “ancient languages” within the Department of Linguistics and Philology, as well as the Department of Scandinavian Languages, was highly rewarding for the panel. The classification “ancient” is not always meaningful, however, as in the case of Semitic Languages, Indology and Comparative Indo-European Linguistics, which are fields also comprising modern languages. We note with satisfaction that some of the recommendations reported in the KoF07 evaluation were acted upon constructively, notably resulting in the creation of several doctoral positions. Rather than reiterating impressions from the introduction to the KoF07 evaluation, with most of which we fully sympathise, we would like to point out the following:

- In general, the integration of philological subjects into a Department of Linguistics and Philology has proven to be highly successful. While such a construct allows for genuine linguistic and philological research, it also facilitates applied research incorporating historical, political, and religious aspects.
- We were positively impressed with the generally high quality of research and number of existing scholarly networks, as suitable for a major university.
- Regarding bibliometrics, we recommend a more varied approach that also gives due weight to national (Swedish) publication channels, as long as these are peer-reviewed.
- Following up on the previous point, the development of long-term projects, e.g., the compilation of grammars and dictionaries, should be administratively encouraged.
- Given the high degree of competition for external funding, we recommend the provision of logistical help and advice for researchers writing relevant applications.
- We note with satisfaction the positive working environment and conditions for doctoral students, and that access to doctoral positions appears to be entirely non-discriminatory in regard to non-Swedish students.
- Regarding the time allotted for research, we note that lecturers and senior lecturers have a heavy teaching load that is not conducive to developing and completing scholarly projects, especially in the light of comparatively lengthy semesters in Sweden. In this regard, the rather light teaching load of programme professors, also when compared to that of promoted professors, appears anomalous to us from an international perspective.
• We note that the number of interim positions (guest professors) may create an atmosphere of instability on the side of the students, in spite of the high motivation of the involved researchers, and recommend that these positions be phased into more permanent positions or at least reflect planning over a longer period.

**Semitic Languages**

*General assessment of the unit*

The Semitics unit, which comprises teaching and research mainly in Classical and Modern Standard Arabic, modern Arabic dialects, Biblical Hebrew, Syriac, and (on occasion) Classical Ethiopic (Ge’ez), continues to be impressive in terms of both scholarly breadth and depth. The staff consists of one (chair) full professor of Semitic languages (Bo Isaksson), one full professor of Arabic (Gail Ramsay), one associate professor of Semitic languages (Mats Eskhult), one senior lecturer in Semitic languages (Anette Månsson), and one senior lecturer in Arabic (Maria Persson), whose position is, unfortunately, just temporary. In addition, the unit hosts four active researchers, who cover areas from the Ethiopic apocryphal literature and historiography (Witold Witakowski), modern aspects of Judaism and anti-Semitism (Tal Davidovich), classical Arabic poetry (Jordi Ferrer i Serra), and Hélène Kammensjö (modern Arabic dialectology). The thematically affiliated field of Assyriology will be treated in a separate chapter, even though it has recently been joined with the Semitics unit (see below).

The current research projects of the active staff cover a vast array of topics, ranging from grammatical issues such as the analysis of circumstantial qualifiers in Semitic to modern literature in the Gulf States, discourse analysis of modern Arabic media (among other channels: al-Jazeera), including the blogosphere and modern social media, classical and modern Arabic and Hebrew literature and text linguistics, and cross-cultural writing in the Gulf States and in Oman.

The unit currently hosts seven PhD students, whose research topics include both linguistic and literary issues in Biblical Hebrew and Classical Arabic; one student (S. Tezel) just finished and published her thesis on Arabic cognates in a variety of Eastern Neo-Aramaic (Turoyo). Other dissertations in progress include work on Arabic Bible translations (Lindgren), an edition of a Classical Arabic manuscript (Morén), aspects of Biblical Hebrew syntax (Petersson), a Syriac commentary on Aristotle (Aydin), and a comparative analysis of negation markers in Semitic (Sjörs).

This research and teaching framework in the Uppsala unit documents that a solid grounding in philology and linguistics also enhances the investigation of broader issues relevant to the society at large, e.g., issues connected to new media. It is intellectually important to continue the practice of teaching and conducting research in several Semitic languages under the umbrella of philology and linguistics as is currently the case at Uppsala University.
Quality of research

Generally speaking, the quality of research carried out in the unit can be characterized as being of an internationally high standard. The recent joint monograph published by Bo Isaksson, Heléne Kammensjö, and Maria Persson on circumstantial qualifiers in both classical and modern Arabic, Arabic dialects, as well as different stages of Hebrew has already attracted high praise in the field. The same holds for Persson’s contribution “Circumstantial Qualifiers” in the online edition of the *Encyclopedia of Arabic Language and Linguistics (EALL)*. It is commendable that funding of this project, which rests on both intra-Swedish and international cooperation, has now been extended. In general, the quality and the interesting topics of the dissertations supervised in the unit have to be commended. The number of nine completed dissertations in an eight-year period is impressive in itself.

The same holds for the ongoing and planned projects, all of which are of interest not only from an academic perspective but also for their more general impact. The number of four externally funded projects (Swedish Research Council) deserves praise. These projects cover areas from language and linguistics all the way to such highly relevant topics as the Arab(ic) blogosphere and a diachronically oriented research project on the phenomenon of anti-Semitism. The panel was impressed by the innovative scope and design of the projects, which to our knowledge do not duplicate research themes elsewhere.

Members of the staff edit the important monograph series *Studia Semitica Upsaliensia* and participate in the editing of the widely recognized journal *Orientalia Suecana*, as well as the online reports *RAAS (Reports on Asian and African Studies)*. Isaksson was recently appointed to the editorial board of the internationally respected journal *Al-Karmil*. The publication profile of the unit is also highly satisfactory, as it features numerous publications within peer-reviewed channels such as the Harrassowitz series *Abhandlungen für die Kunde des Morgenlandes*, the journals *Wiener Zeitschrift für die Kunde des Morgenlandes*, *Zeitschrift für arabische Linguistik*, and others.

Research environment and infrastructure

The interviewed staff and PhD students appear to be satisfied with the general research environment (space, library situation, research expenses). Graduate students appreciate the opportunity to take part in teaching. The unit has successfully integrated guest lecturers (e.g., Emanuel Tov and Eran Cohen from the Hebrew University of Jerusalem) into its teaching programme.

The unit has had considerable success in attracting funding from external sources, notably the Swedish Research Council.

Networks and collaborations

The number of leading international scholars from European countries, Israel, and the USA who visited the unit in the past four years is noteworthy. Staff and students in the unit regularly give papers at both Scandinavian and more...
broadly international conferences. Recent workshops organized at the unit include a meeting on cataloguing of Oriental manuscripts in 2010 and an international meeting on circumstantial clause-combining in Semitic in 2011. The latter meeting grew out of the previously mentioned Swedish Research Council project initiated by the unit. The close cooperation with the Hebrew University of Jerusalem is a great asset in this context.

**Opportunities for renewal and emerging science**
The research activities in the unit are characterized by both traditional philological methods and modern innovative approaches to subject matter, notably in the realm of discourse analysis in modern Semitic languages, including media language. This positive situation could further be supported by the hiring of native speakers as lecturers in both Arabic and Hebrew. For Arabic, this goal will be met with the hiring of a new lecturer (temporarily Sina Tezel, a native speaker of both Arabic and Turoyo [a branch of Eastern Neo-Aramaic]).

The research activities of the junior faculty, too, are very impressive and deserve strong support, including postdoctoral positions.

**Actions for successful development**
It was pointed out that the administrative integration of Assyriology into the Semitics unit may well have a negative impact on the staffing situation in both fields. However, this should by no means serve as a pretext for (further) downsizing the present teaching resources in the unit.

**Effects of the KoF07-evaluation**
The KoF07-evaluation resulted in the hiring of an additional lecturer in Arabic (Maria Persson), as recommended by the panel. Unfortunately, this position is now endangered as a result of the administrative integration of Assyriology (which deserves to remain a field of its own) into the Semitics unit.

**Other issues**
We have an excellent impression of the training of doctoral candidates at the unit. The regular funding of longer visits by students to the Middle East is another positive feature.

**Assyriology**

**General assessment of the unit**
Assyriology at Uppsala can best be described as “punching above its weight”. KoF07 already documented impressive research results in this field, and we can use these results as a milestone to mark the contributions Uppsala has made to Assyriology and Humanities in general. In particular, the cataloguing of cuneiform archives from ancient Assur and Babylon in the Vorderasiatisches Mu-
seum, Berlin, is internationally recognised, as well as general studies of ancient libraries and archives. Moreover, since 2007 new research projects include a study of 300 cuneiform tablets from the only palace archive known from Babylon, belonging to Nebuchadnezzar. A second project, a virtual reconstruction of the city of Babylon and its architecture, indicates how earlier reconstructions of the famous Ishtar Gate (in the Pergamon Museum) do not accurately reconstruct the ancient Procession Street. A Google Map project mapping all ancient sites in the Near East is enormously useful as a teaching and research tool. Finally, Mesopotamia (and especially Babylon) is well represented in the global Urban Mind interdisciplinary project.

Quality of research
The research in Assyriology is of internationally high standard, since there is no doubt about the in-depth (gründlich) nature of the research contribution and the value of this research internationally. Uppsala research has been laying the groundwork for research projects elsewhere, and the catalogues of tablet archives in Berlin have had a major impact on the creation of a German Research Council (Deutsche Forschungsgemeinschaft) project on Assur and a second planned project on Babylon.

Research environment and infrastructure
The position of Assyriology in Uppsala is quite different from that of its sister discipline, Egyptology, in the Faculty of Arts, with its close associations with archaeology and history. There are strengths and weaknesses in both models, but the advantages of having Assyriology being more closely allied with Semitic Languages and Philology outweigh the disadvantages. Akkadian is the earliest Semitic language attested in writing and extends over the longest period, with some three millennia of written records; as such, it offers vital support for any programme in Comparative Semitics, which is one of Uppsala’s major research strengths. At the same time, language and textual studies find a suitable setting for Assyriology within the Faculty of Languages, where the emphasis supports this kind of approach (in contrast to more historical studies or area studies). Opportunities for collaboration in research seminars are quite good, considering the limited number of teaching and research positions allocated to Assyriology within the university.

Networks and collaborations
All involved with Assyriology at Uppsala, both at staff and student levels, have spent time abroad at other centres, and this kind of cooperation is noteworthy and commendable.

Opportunities for renewal and emerging science
One of the key features of Assyriology within Sweden is the “national responsibility” which the university bears for this discipline. To take this responsibility
seriously, however, one must bear in mind the multi-faceted and complex nature of the discipline, which comprises both Sumerian and Akkadian languages in an intimately linked linguistic culture. The discipline reflects the fact that Mesopotamia was essentially bilingual, and even after Sumerian was no longer a spoken language it was studied, read, and written until the very end of the usage of cuneiform script, and the two languages are as interdependent as are Latin and Greek within Classical philology. In order to promote the field of Assyriology, it would be desirable for both languages to be represented within the teaching and research environments, which would also bring other benefits to the university, in terms of broadening the scope for future programmes. Assyriology, for instance, would be much better placed to contribute towards more general studies of early writing, bilingualism, multilingualism, and diglossia, than it is presently able to do.

**Actions for successful development**

There is a unique opportunity for Uppsala to develop studies in Assyriology which must be acted upon within the near future. The eminent Sumerologist and lexicographer, Åke Sjöberg, has retired to Uppsala (his alma mater) after serving for many years as Professor at the University of Pennsylvania. His life’s work included an enormous card-file of all Sumerian literature, which was previously used for writing the first few volumes of the *Philadelphia Sumerian Dictionary* (which unfortunately has now been discontinued). It is the understanding of the panel that Professor Sjöberg would be very happy for his card files to be transported from Philadelphia to Uppsala, where they could form the basis for future studies in Sumerian lexicography.

**Effects of the KoF07-evaluation**

The panel notes with regret that the recommendation in the previous report (2007) to hire an additional Assyriologist was never acted upon. Neither did the previous report recommend the administrative integration of Assyriology into the Semitics unit.

**Other issues**

It is worth noting that new directions in research have been introduced since 2007 and that all three current PhD students were attracted to Uppsala from other universities. Uppsala therefore has the potential to become an international centre for the study of Assyriology.
Indology and Comparative Indo-European Linguistics

General assessment of the unit
The field covered by the unit is vast, since it encompasses:

• a historical and cultural continuum of about 4000 years,
• a geographical area (South Asia) comparable to Europe as a whole,
• about one fourth of the global population, including three of the ten most populous countries (India, Pakistan, Bangladesh),
• a striking religious diversity, which includes the majority of adherents of Hinduism (the third largest global religion), Sikhism, Jainism and Zoroastrianism, as well as the majority of Muslims by regional grouping (about 30 %),
• a linguistic diversity (South Asia is one of the linguistically most diverse regions on earth) including languages of Indo-European, Dravidian, Sino-Tibetan and Austro-Asiatic origin, two of the major classical languages of Asia (Sanskrit and Pali), two of the ten languages with most native speakers globally (Bengali and Hindi/Urdu), and a large number of other languages with long literary traditions and speakers numbering tens of millions,
• a remarkable diversity of scripts both modern and ancient.

Since this whole spectrum cannot be covered more than rudimentarily by any single individual, the newly appointed professor will need to identify particular areas of strength to develop further in teaching and research.

The global changes currently taking place have a direct impact on this unit in particular. The rapid rise of India as a key global economic and political player, as well as the threats of fundamentalist terrorism and war linked particularly with certain areas of South Asia, and the rapid expansion of migration out of this area all make a refocusing imperative, changing the traditional understanding of this field of study as it has prevailed since the 19th century. This process, already begun before, and commented upon by KoF07, is still incomplete, reflecting the state of flux in this academic domain worldwide. Given the challenges faced, the task is obviously not easy and cannot be regarded with short-term priorities in mind if optimal results are to be achieved.

Against this background of transition and the quite rudimentary present academic staff structure (one guest professor on a three-year appointment nearing completion, one senior lecturer with a heavy teaching workload), it is striking how well the unit has coped with the challenges it faces. The unit is successfully mastering and dynamically expanding its teaching expertise in such diverse fields as classical South Asian studies, post-classical/contemporary South Asian studies, Buddhist studies and Indo-European Linguistics, which are quite often treated as independent disciplines elsewhere. However, the present situation makes it difficult for the academic staff to find sufficient time for research.
Quality of research
The number of research projects completed since KoF07 or being carried out at present is more than could be expected under the circumstances. Generally speaking, the various projects are of an internationally high standard.

Research environment and infrastructure
As already mentioned, the overall research environment is not optimal due to the dearth of academic staff and the need to cover an immense subject area with such limited resources not only in research, but also in teaching, planning and networking. The continuing vacancy of the unit chair makes it difficult to plan and conduct sustainable research. Two external researchers did visit and work at the unit for a while in 2010; the respective research collaborations continue, at a high level of proficiency. But external researchers on short-term visits cannot set the agenda for future research; this must be done by appropriate academic leadership within the unit itself.

Networks and collaboration
The unit is well linked with Nordic networks, such as SASNET. The more long-term and stable non-Nordic collaborations are primarily in classical South Asian studies; these are pan-European, of high quality and very fruitful. Institutional collaborations (as distinct from interpersonal ones) in the target geographical areas of academic research need to be built up, but can be done so in a long-term perspective only when the overall direction of research and teaching is clear. The present holder of the guest professorship has created an impressive list of networks and collaborations focused on post-classical studies not only on the European level, but also with a number of Indian partners. It would be desirable to enable these collaborations to continue by making the position longer-term.

As regards developments within the university, the demands of the changing international status of the region of study have already created heightened awareness of the need for cooperation across disciplinary borders. A South Asia Forum/Centre has already been created and taken up its work, and has unearthed South Asia related competencies in many parts of the university that have hitherto been more or less isolated from each other. A collaborative Forum/Centre of this sort is imperative for a comprehensive approach to the region.

Particularly relevant in this context is that the Indian Council for Cultural Relations is financing consecutive professorships over a period of four years for the study of contemporary India, to strengthen relevant studies at Uppsala. The utilisation of this offer for maximum mutual benefit will obviously be a matter to be determined in the Forum/Centre, in which the unit should play a pivotal role.

Opportunities for renewal and emerging science
Together with the multifaceted nature of the area of study, this unit offers exciting opportunities for systematic cooperation with other units of the depart-
ment, depending on its further development. Should Indo-European studies and by implication Vedic remain a part of the fields covered by the unit, then a stronger collaboration with the units dealing with Greek, Latin, Iranian, Germanic and Slavic languages would serve to strengthen comparative Indo-European studies in a significant way. For the study of mediaeval and modern South Asia, links with the Iranian and Turkic language units should be considered.

Among the languages regarded as national responsibilities, Hindi has been apportioned to Uppsala. Other South Asian languages of relevance for Sweden particularly due to migratory movements, such as Bengali or Tamil, are not covered by the list of national responsibilities, but it would make eminent sense to anchor them in the university system with a similar status given their global relevance, and of all Swedish universities Uppsala seems at present to offer the best environment for this.

**Actions for successful development**

The status of Indo-European Linguistics needs to be reconsidered. This academic field is today present as such in the Nordic states only in Copenhagen and Uppsala. However, its status within the Uppsala unit is de facto linked only to the present senior lecturer, who has a heavy load of other teaching and research duties. This traditional and important discipline should be institutionally anchored in a more permanent manner.

To allow the vacant chair to be filled soon, the university should decide on the orientation of the unit with regard to South Asia. In this connection, the disjuncture between the categorisation of South Asia as “India”, as indicated in the term “Indology”, and the post-colonial realities of present-day South Asia, where India is a political entity occupying only a part of the area, needs to be seriously addressed. The linkage of South Asian studies solely with India engenders resentment in other South Asian countries and precludes effective cooperation; this pertains particularly to Pakistan and Bangladesh. In this regard nomenclature and academic content are intrinsically linked.

Opportunities should be created to allow the unit to consider South Asia on a more comprehensive basis, so that the constraints of teaching staff and finances do not lead to an overwhelming focus on India. This is particularly important in view of the problems of terrorism and unrest posing global threats, and today linked prominently with the Pakistan–Afghanistan region, but also with Bangladesh. The number of immigrants from South Asian countries other than India in Sweden also necessitates a pan-South Asian focus.

The necessary reorientation away from regarding South Asia primarily as a historical region towards seeing it as a contemporary entity must not lead to the exclusion of Sanskrit, the teaching of which should be institutionally guaranteed. In this regard, a strengthening of Indo-European studies with adequate consideration of Old Indo-Aryan would be beneficial.

For a meaningful academic consideration of contemporary South Asia, an exclusive focus on Hindi would not be fruitful. Facilities should be developed...
for teaching the variety of the Hindi-Urdu continuum known as Urdu, as well as of Bengali and, ideally, another major modern South Asian language (e.g., Tamil, Telugu, Marathi, Punjabi). This can be achieved through one or two lecturers with proficiency in more than one modern South Asian language.

The South Asia Forum/Centre, which now is an informal group, should receive administrative support.

**Effects of the KoF07-evaluation**

At the time of the KoF07 evaluation, the unit was headed by a professor whose primary field of study was eastern South Asia, i.e., the Bengali-speaking and adjacent areas. The recommendations made at that time need to be seen in this light.

A guest lecturer for Hindi was appointed, who has since been promoted to guest professor, but only for a limited period of time. However, the recommended professorship for “Comparative Linguistics” (seemingly meaning Comparative Indo-European Linguistics) was not created.

**Other issues**

It is imperative for any discussion on the contents of South Asia studies to lay particular stress on language proficiency. In this regard this unit plays a pivotal role.

**Greek and Byzantine Studies**

**General assessment of the unit**

The heading *Greek and Byzantine Studies* at Uppsala covers a wide field, including research and education in Greek language and literature from antiquity and through the Middle Ages. The staff consists of one programme professor, one guest professor, one senior lecturer, and two temporary researchers; there are four PhD students.

Research was for many years dominated by work on hagiographic texts and on the Byzantine *florilegia* tradition, which earned an international reputation both for the number of publications and for their high quality. On the other hand, when the KoF07 assessment was made, research in classical and late-antique Greek was to some extent neglected, and the future of the unit was uncertain, since the chair of Classical Greek had been left vacant. Thus, the professor of Byzantine Studies had to bear the responsibility also for the classical and post-classical periods of antiquity. This was described as a “regrettable situation” by the KoF07 panel.

The present panel shares the view expressed by the colleagues of 2007 that classical Greek is a necessary basis for studies of later periods in the history of the language and its literature, even culture in a wider meaning. Classical Greek should also be a discipline in its own right in any major university. The panel notes with satisfaction that the faculty has taken certain steps to ameliorate the
situation of Greek studies. After the retirement of Jan-Olof Rosenqvist, a new holder of the Byzantine chair, now renamed “Greek, specializing in Byzantine Greek”, was directly appointed. The university has also hired a guest professor in Greek, with particular responsibility for the classical period and late antiquity. Since 2007 the amount of research in the pre-Byzantine field has increased, as witnessed by the list of publications.

However, a solution involving a guest professor is only a temporary one, and the present panel strongly recommends that, in the near future, a permanent post with particular responsibility for pre-Byzantine Greek should be created.

The work pursued in the unit made a good impression on the panel. Hagiological studies still continue, and a major work on the florilegia tradition has appeared. These two traditional fields have recently been supplemented with research on other genres of Byzantine literature, in particular the novel and rhetorical texts; in both cases, the dependence of Byzantine literature on the ancient tradition and the transformation of that tradition are given emphasis. In particular, the methodological approach to the novel genre is remarkably innovative. Manuscript studies have also gained importance, as exemplified by the work on *Upsaliensis gr. 8*. A project for the digitisation of the 74 Greek manuscripts in the Carolina Rediviva library has begun with a PhD graduate from the unit as its director. A researcher who works with Ethiopic manuscripts has joined the unit and widened its competence.

Thus, there is a great diversity of studies within the unit. The list of interdisciplinary projects and programmes in which the Uppsala scholars take part is an impressive one; it includes *The Urban Mind, Ancient Languages and Cultures, The Ancient Tradition, Det tidiga klosterväsendet och det antika bildningsidealet* (‘Early Monasticism and the Ideal of Ancient Education’), and *Comparative Manuscript Studies*.

**Quality of research**

Greek studies at Uppsala University have a longstanding reputation for output of high quality. The research going on today displays the same degree of excellence. Generally, the research presented to the panel deserves to be classified as of internationally high standard. The pioneering work on the Byzantine novel genre and its complicated relationship to its ancient models may be described as being of top-quality. A couple of PhD theses published in recent years show that the unit succeeds in attracting highly qualified young persons for this sort of studies.

**Research environment and infrastructure**

A high proportion of the staff are relatively young people, which is advantageous with regard to the future development of the unit. The unit disposes of adequate office space, also for the doctoral students. The library service seems to be excellent at the central University Library. However, the holdings of the departmental library need to be updated for Greek.
Networks and collaborations
The unit has established contacts with a considerable number of local, national and international networks and takes good advantage of the opportunities offered by them. The recently recruited professor has experience in working outside Sweden, and the guest professors have contributed to the already existing international profile of the unit. The unit regularly invites scholars from other universities, most of them from outside Sweden, for lectures, seminars, or courses.

In the local milieu of Uppsala the unit has established collaboration also with departments outside the Faculty of Languages, e.g., the Department of Archaeology and Ancient History, the sections for Bible studies and patristics of the Faculty of Theology, and the Swedish Collegium for Advanced Study, SCAS (located in Uppsala).

Opportunities for renewal and emerging science
Overall, the research activities of the unit form a fruitful combination of innovative approaches and traditional philology. The process of renewal that the KoF07 panel commented upon has continued since then. The diversity of Byzantine studies has proceeded further, and classical Greek has got back some of its traditional role. Increasing collaboration with other units and participation in larger projects with other disciplines offer opportunities for new initiatives and further development of the unit.

Actions for successful development
It is essential that both a professorship and a postdoctoral position for classical Greek be established. It is the panel’s impression that this would prove advantageous also to the Latin unit of the department, and that it would facilitate collaboration with other disciplines as well.

Effects of the KoF07-evaluation
The panel of KoF07 pointed out that the most important measure for the improvement of the situation of the unit would be the recruitment of a professor of classical Greek. This suggestion has not yet been fully implemented. However, the hiring of guest professors for limited periods has had a positive effect, and research in classical Greek is more active now. For the rest, the panel of KoF07 was largely satisfied with the renewal that was taking place within the unit, and the present panel also has the general impression that the process of renewing has been going on steadily since then.

Other issues
The doctoral training was described by the students as being excellent, especially as regards international cooperation.
Latin

General assessment of the unit
Research at the Latin unit has both a strong diachronic and interdisciplinary profile: diachronic in the sense that both the Latin of the classical and mediaeval and early modern period are dealt with; interdisciplinary in the sense that, besides the philological and linguistic work, a strong historical approach is present in the research of individual members of the unit. The unit comprises teaching and research in classical Latin, Italic dialectology, Roman literature including textual criticism, Roman religious thought, Roman social history, Latin epigraphy from the ancient period, and linguistic, philological and editorial work on mediaeval and early modern Latin, especially in Sweden and in the Baltic region.

The current research projects of the limited number of active staff cover a vast array of topics, ranging from diachronic studies on the Latin case system and verbal system and studies on literary and non-literary Late Latin, carried on by Professor Haverling, to studies on Roman poetry and epigraphy, dealt with by Associate Professor Christer Henriksén. Two professors emeriti, Monika Hedlund and Hans Helander, and Docent Marianne Wifstrand Schiebe are still active in research in the fields of mediaeval codicology, the history of ideas and the Latin of the early modern period.

The unit currently comprises several postdoctoral researchers, whose scholarly work is on a broad range of topics: textual questions of central Roman authors like Varro, Cicero and Vitruvius and mathematical texts (Erik Bohlin), use of Latin in 17th and 18th century Sweden (Josef Eskhult), Swedish Neo-Latin poetry (Peter Sjökvist), cases in Sabellian and Latin (Karin Tikkanen), and medical dissertations from the 18th century (Urban Örneholm).

The unit also hosts four PhD students: Hannah Bartonek, writing on the poem Punica of Silius Italicus; Elena Dahlberg, on a Neo-Latin poem in honour of King Karl XII; Moa Ekbom, on the Historia Augusta; and Andreas Thor, on the language and style of the Christian epic poet Iuvencus (4th century). Lisa Hagelin defended her dissertation in November 2010 on the social status of imperial freedmen.

The teaching and research framework in the Latin unit documents a solid grounding in philology and linguistics combined with deep historical insight. It is important to continue the practice of teaching and conducting research in both Latin literature and Latin language in all periods (archaic Rome, imperial period, late antiquity, Middle Ages, modern period) in a broader historical context. It should be acknowledged that the unit has revised the curriculum and is developing a Latin textbook and grammar in Swedish, thus making the subject of Latin more accessible to students.

The unit intends to take part in many of the same interdisciplinary projects and programmes as the sister unit of Greek, including The Urban Mind, Ancient Languages and Cultures and The Ancient Tradition.
Quality of research
The quality of research carried on in the unit can be characterised as being of an internationally high standard. The new orientation of the programme professor towards modern linguistics (e.g., in her work on the analysis of tense and aspect and issues related to the case system) is praiseworthy. The recently published monographs are mainly of high quality; this also holds true for the majority of dissertations. It should especially be emphasised that with the editions and analyses of Swedish Neo-Latin the unit has been assigned a “national responsibility”.

Members of the staff edit the important monograph series Studia Latina Upsaliensia and figure among the editors of such widely recognized journals as Eranos. They are publishing both monographs and scholarly articles in respected foreign publishing houses and journals. Professor Haverling has recently been appointed as Sweden’s representative to the Internationale Thesaurus-Kommission, the editor of the great dictionary of ancient Latin Thesaurus linguae Latinae published by the Bayerische Akademie der Wissenschaften. Researcher Eskhult was recently awarded the Vivien Law Prize (UK) for an essay on language and history.

Research environment and infrastructure
The unit has had the opportunity to receive several guest lecturers of high quality. The unit has obtained conference funding from external sources and is trying to raise more funds for research. The service provided by the central university library, Carolina Rediviva, is excellent, whereas there seems to be room for improvement in the departmental library.

Networks and collaborations
The number of leading foreign scholars who have visited the unit in the past two years is commendable. Staff and students of the unit give papers at both Scandinavian and international conferences. The programme professor is organising the International Conference for Latin Linguistics in June 2011, and another conference on ancient Latin medical texts in 2013. The unit is also participating in a pan-Swedish project to standardise PhD programmes in the Classics.

Like the Greek unit, the Latin unit has collaborated with the Chair of Antikens kultur och samhällsliv in research on Classical Archaeology.

Opportunities for renewal and emerging science
The research and teaching activities form a fruitful combination of basic philological and linguistic working, combined with a historical approach that renders possible a better understanding of Latin literature and language against the background of ancient Roman society. Above all, the close relationship with the sister discipline of Greek should be further strengthened, for example by requiring from the students of Latin a working knowledge of Greek. We strongly endorse the unity of classical studies, as in other major European and North American universities.
Actions for successful development
It is essential for the university as a whole that Latin language and literature of both the Roman and post-Roman periods continue to be taught at the highest level. Just as with Greek, a basic knowledge of Latin is indispensable for a wide range of subjects, ranging from the humanities to medicine and pharmacology.

Effects of the KoF07-evaluation
In the KoF07 evaluation the high level of mediaeval and Neo-Latin studies was emphasised. Alongside the welcome and successful broadening of the subject under the new programme professor, it is still of importance to maintain the teaching of and research into mediaeval and Neo-Latin.

Other issues
We would recommend the strengthening of intra-Swedish and international networks, especially for PhD students. The PhD students appreciate the opportunity to take part in teaching.

Runology, Early Scandinavian Languages and Onomastics

General assessment of the unit
Within the larger Department of Scandinavian Languages, the subjects of Runology, Early Scandinavian Languages and Onomastics are represented by one Chair in Scandinavian Languages, one Chair in Onomastics, one promoted Professor, five very active emeriti, two Senior Lecturers, one Junior Research Fellow, two Researchers, four postdoctoral positions, and ten PhD students. These subject areas are not separated into any smaller unit, but are fully integrated into the larger Department of Scandinavian Languages (the rest of which was evaluated by Panel 6).

There is a broad scale of teaching and research activity from the oldest documents (runic inscriptions) via medieval texts and onomastics up to modern Scandinavian language studies. The foundation of all this is a commendable adherence to philological traditions (runology and onomastics), which has become increasingly rare throughout Scandinavia. At the same time, the researchers in these areas have shown a positive, even strategic, attitude to widening the focus of research towards more modern approaches to texts, e.g., multi-modal analysis of rune stones, diachronic syntax and socio-onomastics. During the last few years, the profile in Old (West) Norse manuscript and textual studies has been raised and sharpened. This research activity is strengthened by a considerable number of international peer-reviewed journals and monograph series in onomastics, runology and West Norse studies edited by members of the department, often in international collaborations such as with Oslo for the journal Futhark.

The department has by far the largest number of PhD students among de-
partments of Scandinavian languages in Sweden, as a result of its strategic decisions. There is an excellent completion rate, with 19 completing in 2007–2010. There are currently 18 doctoral candidates. It is noteworthy that this academic environment has attracted doctoral candidates from other Scandinavian countries and continental Europe. Much of the renewal of these subject areas comes from innovative PhD projects. Co-supervision of these students with staff from other units or other universities has proven to be fruitful and effective.

**Quality of research**

The work of the department, including the completed PhD research seen by the panel, is generally of an internationally high standard. Several members of the academic staff have been awarded prizes for their research.

Uppsala’s strength in traditional runic and philological research is important and essential to preserve in the Swedish and international context. The *Codex Upsaliensis* project is an excellent example of strong philological research emerging from local scholarly traditions and resources. This work, which is not yet completed, has the potential for great international impact.

The department is also involved in a faculty-wide initiative to digitise and make available (with tagging and annotations) the rich manuscript collections of the university.

One particularly successful constellation is the range of activities associated with runology, such as the initiation of the new international peer-reviewed journal *Futhark*, continued development of the *Samnordisk runtextdatabas*, an active seminar culture, collaboration with the runologists in Riksantikvarieämbetet (Swedish National Heritage Board), and the work of several doctoral students working in this area. It would be particularly beneficial for the *Samnordisk runtextdatabas* to receive funding for its further development into a web-based resource.

The productivity of onomastic research is still noteworthy (with, e.g., three completed dissertations since 2007), with emeriti and junior faculty publishing in both traditional place-name studies and new areas such as socio-onomastics, showing the willingness to broaden the scope of traditional onomastics in both the object of the study and the methods.

**Research environment and infrastructure**

The staff represents a broad spectrum, ranging from distinguished emeriti to a healthy postgraduate community. (As observed in KoF07, the staff is still predominantly male, despite a preponderance of female doctoral students.)

The unit has a wealth of research seminars that meet frequently, and is active in a variety of organisations such as Isländska sällskapet, Ortnamssällskapet i Uppsala, Svenska fornskriftsällskapet and several others. The co-location of the onomasts with SOFI seems to be a productive relationship on both sides.

The department is well-supplied with appropriate facilities, and the staff are satisfied with the availability of material through the library.
Networks and collaborations
The unit enjoys extensive international cooperation, for example with Oslo in runology, and with three different international onomastic associations, including NORNA. Manuscript research is also associated with the international umbrella organisation MENOTA (Medieval Nordic Text Archive).

The unit has been particularly active in organising the following international conferences during the last two years: the 14th Saga-Conference in 2009 (nearly 300 delegates), the 11th conference on Svenska språkets historia, and the 40th NORNA symposium, both in 2010. The first national conference on language history was organised in Uppsala 2010.

Opportunities for renewal and emerging science
It is clear that much research is already moving in a socio-historical direction (due in large part to the initiatives of PhD students coming from outside the unit), without compromising traditional philological rigour. This development should be encouraged and strengthened further, and could usefully feed into teaching at all levels.

We would like to suggest that runology could be widened towards cooperation with other epigraphic disciplines, both at Uppsala and elsewhere, and historical and contact linguistics. Moreover, onomastic research could enter a fruitful dialogue with disciplines such as medieval archaeology, and could also develop further in a contact-linguistics scenario. In general, all subject areas would benefit from further reflection on methods and openness to different theoretical approaches.

Actions for successful development
The department should be encouraged to continue its commendable approach to international cooperation, by inviting visitors on a regular basis, and sending their own students abroad, while also continuing to receive students from other universities.

Several persons in the department have the potential to conduct high-level research in historical linguistics and should be encouraged to do so, for example in the areas of historical and/or comparative sociolinguistics, (de-)grammaticalisation, etc. The panel would support the department’s wish for a tenured position below professorial level in modern historical linguistics.

Larger research projects, such as the proposed department-wide project on the 16th and 17th centuries, would be very welcome. This would also provide the opportunity for collaboration with Neo-Latinists in the Department of Linguistics and Philology. Other proposed projects, such as those on unofficial (place-)names or metaphorical names, should continue to seek funding.

The department expressed the ambitious aim of becoming a world-leading centre of runology in the context of remaining a large and wide-ranging academic environment for philology and linguistics. In order to achieve this goal, it would be fruitful to continue combining the more traditional approaches with
methods and theories within historical linguistics as practised internationally.

The focus on Old Norse and Icelandic should also be maintained and developed.

**Effects of the KoF07-evaluation**

The report of the KoF07 panel was favourable, and it appears that the department benefited in the form of several short-term postdoctoral positions, which they have commendably used to help new PhDs further their career prospects.

The *Codex Upsaliensis* project fulfils the recommendation of establishing a pan-Nordic perspective in the unit’s research, and the panel hopes this will continue to be developed, since Uppsala has the most pan-Scandinavian approach of the Swedish (and Finnish) universities. However, there still remains much to be done in Old East Scandinavian studies, both textual and linguistic, although some efforts have been made to address this, as for example the project “The syntax of the early Scandinavian noun phrase”, which has recently been funded by the Swedish Research Council. The department has also recently appointed a Junior Research Fellow working on language change and variation, and a PhD student working on a previously unstudied Old Swedish manuscript. Initiatives like the 2007 seminar on Scandinavian languages in the 15th century should continue.

The unit recognises it has not yet fulfilled the recommendation of using the full potential of the web in developing the *Samnordisk runtextdatabas*, to provide essential infrastructure for international research in runology.

**Other issues**

Much of the onomastic research has direct relevance for social policy in contemporary Sweden (e.g., naming practices and questions of identity among the Sámi and immigrant populations).

There is great public interest in onomastics, runology and dialectology, and the department is active and effective in making their research in these areas more widely accessible. The department organised an extensive and successful lecture tour of North America in 2010, promoting runology.
Panel 8

Scope of the panel’s evaluation:
Centre for Gender Research
Department of Art History
Department of Literature
Department of Musicology
Department of Philosophy

General observations and recommendations
A general reservation must be made concerning the following assessments. Although the panel appreciates that the KoF11 evaluation tries to counterbalance a bibliometrical measurement of productivity by a peer review of research groups and departments, the members are not convinced that the setup of the evaluation allows us to formulate a well-founded judgment on the substantial quality of research, at least not within the humanities. The assessments of the panel are based on three pillars which are all for different reasons insecure: (i) a short, written self-presentation by each department; (ii) a meeting of averagely two hours’ duration with representatives from each department; and (iii) statistics or indicators drawn from the university’s common databases as background material. The members of the panel have not been able to read the mass of publications that the departments have produced since 2007, and must rely on their more or less random knowledge of some of them. None of the members of panel 8 took part in the KoF07 evaluation.

The research in the five departments and centres that the panel has visited is generally of an internationally recognized standard or higher. The panel has identified eight research groups or units as being of internationally high standard and two of top-quality.

It should be noted that several of the departments visited by the panel carry out research which is closely linked to a regional heritage, or to materials written in Swedish or found uniquely in Sweden. This would apply to some of the research pursued within the Department of Musicology, e.g., that concentrating on the “Düben Collection” at the University Library; or to a considerable part of the work in the Department of Art History with Textile Studies, in which a ‘hands-on’ approach is taken to materials on a local or regional level. Indeed, much of the research at the Department of Literature relies upon manuscripts and letters of Swedish authors in the collections of university libraries or the Royal Library, as well as on Swedish print in general. All of these regionally or nationally rooted research activities tend to be acknowledged internationally for their demonstration of a unique understanding of issues in their local context, and they deserve not only to be protected and nurtured, but also recognized as work which sets a standard for the international community to follow.
The special conditions of such research are not made allowance for by a simple rating in narrowly defined categories of quality.

The panel considers the activities made by the different departments for public outreach highly satisfactory.

The PhD students in all the five departments visited seem to be well integrated, and their work is appreciated and respected by the research milieu. As a matter of fact, a good deal of the departments’ research is performed by the PhD students, in some departments around 50%.

The DiVA-system in which the scholars at Uppsala University are expected to register their own publications – so that the registrations can be used as a means to allocate part of the general funding – is inflexible, which causes much frustration and general complaint. For example, critical editions of text and music, which normally represent many years of solid scholarly work, cannot be registered in their own right; only their introductions are accepted by the system. Secondly, individually authored articles or chapters in books that are peer reviewed cannot be registered as such. Thirdly, even articles that in some context have been peer reviewed as single items cannot be registered as peer reviewed, if they are published in a journal which is itself not under peer review. In addition, it has been stated before the panel that the classification of publication language in DiVA is insufficient (‘Swedish / English / Other’), and that monographs are undervalued compared to articles.

In this connection a general problem should be mentioned: In Sweden there is no general practice among publishing houses to have the manuscripts they receive from scholars peer reviewed. Since many scholars within the humanities write books that are published by commercial or semi-commercial publishing houses and reach a larger public, this causes an evaluation problem that is growing concurrently with the demand within the university culture that humanistic research publications must be peer reviewed. Procedures should be established to support the double goal of peer reviewing and large public outreach.

The panel was introduced to the SALT programme (Forum for Advanced Studies in Languages, Arts, Theology) through a short lecture by its director and was then given the opportunity to ask questions. The panel members had received no written presentation of SALT in advance and could thus not give any well-founded recommendations concerning the programme, although it was the impression of the panel that the ideas behind SALT are sympathetic and worth supporting. One of the departments which the panel has assessed expressly mentions in its self-evaluation that SALT fills a vital need, and recommends that the programme be extended.

Among the recommendations of the panel concerning measures to be taken, the following should be especially highlighted, since they imply funding:

- The Centre for Gender Research should be given more permanent research personnel.
- The Centre for Gender Research should be given the possibility to have its own PhD programme.
• In the Department of Art History, the permanent staff members’ load of teaching and administration should be reduced in order to increase their active research time.
• A chair professor in Textile Studies (within the Department of Art History) should be appointed.
• The Section for Rhetoric (within the Department of Literature) should be given additional PhD scholarships in order to increase its percentage of research.
• The assistant professorship which was given to the Department of Musicology as an effect of KoF07 should be made into a permanent position, preferably on a higher level.

Centre for Gender Research

General assessment of the unit
The Centre for Gender Research is a transdisciplinary unit maintaining a broad profile in gender studies with a particular emphasis on gender studies in the natural sciences. The Centre pays special attention to interdisciplinary work, both in its daily research practices and its seminars, where international levels of theoretical and methodological concerns are addressed, and in the international conferences it organizes. The main part of their publications lies within the broad domain of gender and science, notably research focused on materiality, bodies and relationships between humans and non-humans. The Centre has a double mission: first, to function as a node for gender research for the whole university and, second, to create a strong externally financed research environment. Thus their main activity as well as budget is centered on research, and only to a lesser degree on teaching. Their active role inside the university is mirrored in the financial structure of the Centre, where each of the nine university faculties contributes to the budget. The recently announced chair in gender studies for example, is co-financed by all of the faculties.

The Centre’s profile is divided into five interdisciplinary thematic research groups with an overarching focus on gender theory. Their current research portfolio consists first and foremost of the Research Counsel’s fairly large grant for building a Centre of Gender Excellence together with a number of smaller and mid-sized projects. The excellence project “Nature/Culture – transgressive encounters” (GenNa) is divided into four transdisciplinary research themes which also constitute four of the Centre’s profile areas: Gender and Physics, Gender and Education, HumAnimal, and Body/Embodiment. It is important to notice that the borders between the themes are purposely blurred, providing the GenNa with a high degree of flexibility. Some of the smaller and mid-sized projects are collected under the heading Masculinity studies which constitute
the fifth profile area of the Centre. In addition there are a limited number of freestanding projects. It is fair to conclude that the Centre is very successful when it comes to external funding.

The Centre’s profile is very strong on gender and science and the research is original as well as of high academic standard. The researchers are involved in a multitude of international networks and cooperation. The Centre appears to be well organized with a good support structure for research. They have a high proportion of men compared to similar centres. They work in a proactive manner with regard to external funding, yet they provide ample room for nurturing innovative ideas, combined with a sound sense of economic realities. This is evident in the collective attitude detected in relation to initiation of new research projects as well as in a productive management strategy allowing a good deal of freedom.

Quality of research
The double mission of the Centre for Gender Research is visible in its publications. However, as is to be expected, the GenNa project is the most productive. The current research activities at the Centre all maintain a high academic standard, but two areas seem particularly promising: the *HumAnimal* and *Body/Embodiment*. These are both of internationally high standard, with the *HumAnimal* as the more original of the two. The two interconnected areas have the potential to become ‘top-quality’. However, there already exists a huge international corpus of feminist research on the body, which might make it a challenge for a relatively small research unit such as the centre in Uppsala to carve out a special niche. The *HumAnimal*, on the other hand, relates to a rapidly emerging international research area where the traditional separation of nature and culture is challenged theoretically as well as empirically within gender studies as well as outside it. The field is diverse and full of contradictions, which means that the Centre may have the potential of taking a lead here. Should this occur, the Centre would be richly rewarded for its consistent work on interdisciplinary approaches to gender and science or the “transgressive encounters” as the Centre refers to this activity.

Research environment
The Centre for Gender Research provides a very good work environment for research. It comes through as a positive, lively and proactive research unit. Local collaboration is well supported with regular seminars on gender theory as well as regular meetings in research groups on more specific topics. The Centre’s strategy of engaging visiting scientists in the writing of applications stands out as a fruitful strategy both for scientific interaction and in terms of financial possibilities.

To ameliorate a continuity problem for the Centre, a new chair, we understand, is soon to be appointed. Nevertheless, the Centre has only three senior lecturers as permanent academic staff out of a total number of 26 employees.
Networks and collaborations
The Centre for Gender Research is extremely well connected. It has an active strategy for the internationalization of its research, as well as international collaboration. This is reflected both in its seminar activities and conferences and in its publishing strategies. Visiting scholars are invited to cooperate with the Centre’s employees in concrete ways, such as the above-mentioned formulation of research applications. The Centre also has one local and one international advisory committee.

Opportunities for renewal and emerging science
One challenge facing the Centre now is how to secure continued external funding of a similar or even increased volume, in order to provide a financial base for its many talented young researchers. Another is to develop strategies to utilize the interdisciplinary nodal function for the whole university to generate new projects, while maintaining the Centre’s high standard of theoretical work. There is a potential conflict in the double mission with regard to developing and maintaining a top quality research unit, given the Centre’s current resources and broad mission.

The funding model is an advantage to the Centre in terms of promoting new ideas and hiring new people all the time. One might ask, however, whether this ultimately contributes to a certain instability and the loss of talent, as young researchers leave the unit for more permanent assignments.

Actions for successful development
Two actions have been identified: the need for more permanent research personnel and the desirability of having a PhD programme. A senior lecturer, with more than the present 20% research time allotment, would be extremely helpful in alleviating the first of these needs. Meanwhile, a PhD programme would mean the opportunity to appoint promising recruits for a longer period of time and contribute, together with doctoral supervision and teaching, to more academic continuity. Without their own doctoral programme the Centre risks losing out to other gender studies centres which have such a programme. A PhD programme would strengthen the Centre’s research activities, although it might be more problematic with regard to its nodal function for the whole university.

The GenNa project has provided possibilities for the Centre to prioritize long time research and subsequent high standard international publications. We would encourage the Centre to establish a consistent peer-review policy, so that as many of their publication series as possible were fully reviewed. This could be done without much change to the already existing publishing structure.

Effects of the KoF07-evaluation
It is hard to evaluate the exact impact of the KoF07 on the development of the Centre. It would appear that the request that the Centre function as a “node of gender” for the university has been largely fulfilled. A “database of on-going gender research and gender expertise” might be reconsidered.
Department of Art History

Note: Art History and Textile Studies were separate sections in 2007. While they submitted a joint report in 2011, the two strands each provided their own responses to the questions. As a result, this report provides separate feedback on Art History and Textile Studies under each question.

General assessment of the department
The research of the Department of Art History, together with Textile Studies section, shows an articulated and consciously chosen starting point for research profile. The common feature of these two separate, yet related, fields of research lies in the shared ideas of “hands-on” research, working with material objects and the phenomena of direct observation, all of which play important roles in the research process. There is a high percentage of women in the department, reflecting the traditional gender balance of this subject.

Art History in Uppsala can be identified as one of the carriers of the tradition of European Art History for covering nationally and internationally important areas of cultural heritage. Medieval art and church buildings stand out as research fields in this context. There is also a strong interest in public art, public space, visual culture and visual communication. In whole the department is diversified, more focused on individual output than team work. Synergy is best seen in carrying responsibility on student work, in teaching and creating an inspiring atmosphere for studies. They effectively engage in a range of multi- and interdisciplinary activities through engagement with SALT. They have a very active outreach programme and they engage with a wide range of audiences in Sweden and abroad.

In 2007 Textile Studies moved to the Faculty of Arts and it now sits as a distinct area of research and teaching expertise within Art History. Textile Studies at Uppsala has an excellent reputation and it is of great potential significance to the international academic community. However, Textile Studies has experienced a lot of change since KoF07: it has transferred to Art History, its highly esteemed professor has retired and the current researchers are few in number, quite young and they cannot be expected to have attained an international profile yet.

Overall, the two spheres of the Department of Art History have great potential to produce original research of very high quality.

Quality of research
Overall, the research being carried out in the Department of Art History is exciting and it attracts the interest of the international research community. It is very wide ranging in its scope while also taking responsibility for Sweden’s national heritage.

Within Art History, three areas stand out for comment. The group working on Medieval Art is producing research that is of internationally high standard.
Cultural Heritage (mainly church buildings) as a highly important national task is internationally recognized and highly regarded. The department has participated in the series on Uppsala Cathedral that has been recently completed, and the Database on illuminated manuscripts in Swedish collections is announced to be released 2011. There has been a shift of interest from the Medieval towards the 20th century: since 2007, seven of the nine dissertations focused on the 20th century. Innovative studies have been realized on public space, public art and visual culture, with highly promising developments on aspects of visuality, materiality and the global. Methodologically the research in Art History seems to be moving between solid, traditional starting points and a theoretical elaboration of visual studies.

The Textile Studies team is undertaking wide ranging, exciting and original research. Most of their research is tightly focused on the early modern period in Sweden, and it is of significant standing. In its recently published form, in Swedish, it falls in the internationally recognized category, being of great relevance and attracting international interest. But it is very important to note that it has the potential, with wider dissemination and greater staff numbers, to be rated much higher in the future.

Research environment and infrastructure
The Department of Art History is located in a very attractive research environment in terms of space, collegiality and the connections to other academic disciplines. Their ability to realize their research potential is hindered by a heavy teaching load, a large administrative burden and technological problems.

The Art Historians show great eagerness to connect research with teaching. The web-based projects Spoonfiles and Humanistportalen act as inspiring forums for promoting ideas and discussion for the students: but these are not focused research projects. The approach results in a tendency to have a lot of projects and a slight lack of focus. This can be seen as a strength and a weakness.

The Textile Section is very small. This is particularly challenging in view of the unique scope of their research interests, which encompass object based research, archival research and research based on textile technology and techniques. Their small numbers also mean that they have a lot of teaching; and because of their youth, at least in the short term, they will need to invest a lot of time in preparation and planning.

There is sound evidence of synergy between the Textile specialists and the Art Historians in terms of teaching, but there is considerable scope for more collaboration in terms of research, especially in the medieval and early modern period (for example on projects relating to ecclesiastic environments and objects). There is also the potential for very interesting and fruitful collaboration with colleagues in other departments such as History and Gender Studies.

Networks and collaborations
The Art Historians are very active in various international networks and organi-
zations. They present their work in international and national arenas making significant contributions in the field of medieval art and critical questions on visual culture. Networking is also amplified through exploring on excursions. Multi- and interdisciplinary interests are reinforced by SALT, assisted by the associate professor in Art History who now runs SALT. The staff of the Textile Section is involved in the wide and exciting variety of networks within Art History (e.g., the seminar of Medieval and Renaissance Studies), while the interdisciplinary research seminar KoMa brings exciting links with colleagues in History and Anthropology. The Textile section also has excellent links with the international research networks through their retired professor Margareta Nockert, and the current staff are joining these groups and so developing their own international profiles. It is essential that staff from the Textile Section continue to be involved in all of the key committees.

**Opportunities for renewal and emerging science**

Within Art History, researchers on Medieval art, sacred space and cultural heritage are to be encouraged to maintain their very high standards and to potentially develop new research methods to enhance their profile even further. Digital and virtual research outcomes are one possibility, but these will need financial support to make them cutting edge. The theme on Objects and Materiality is very significant for bringing Art Historians and Textile Historians together and it should be taken further in the future. When developing the highly valuable work on aspects of visuality, materiality and the global, the department would benefit from developing the research profile through discussion or team work that would include representatives of all the research areas of the discipline.

The research areas outlined in the KoF11 report in Textile Studies are all new, arising out of the doctoral research of the staff members. They will be of great interest to the international academic community. All research active Textile staff should be encouraged to develop their research profile and publish monographs as their research evolves. This will be very important for their careers and the development of the Section’s profile.

PhD dissertations dominate recent publishing by the department. While such a vibrant PhD culture is good, the permanent staff is encouraged to increase its own visibility within the research community by publishing more: either monographs or articles in peer-reviewed journals. Specialist journals may well require publication in French, German or English to complement publications in Swedish. Support should be provided to staff to help them with this when necessary.

**Actions for successful development**

For the Art Historians, five key actions are recommended. First, they need to attract support from the university to reduce their teaching and administrative load, in order to give research active staff more time for research. Second, while the variety in the staff’s research interests is impressive and very attrac-
tive to their students, a more focused approach on a smaller number of research themes would result in a richer output and give visibility to a few, very high quality research areas. Third, as noted above, they need to review their publication strategy and individual targets. Fourth, the staff has a huge burden of PhD supervision for students not funded by the university. Fifth, the department would benefit from better support for technology used in research, teaching and administration.

As stated in the KoF07 evaluation, long term planning for the Textile section is required. This planning should focus on four key areas. First, assistance is needed with PhD recruitment and supervision. This could be through collaboration with senior colleagues in Art History, History or other academic areas. Second, planning the research and publications of the staff is important. Third, mechanisms are needed for easing the teaching burden, thus allowing more time for research and publication. Fourth, the appointment of a chair professor is required in the longer term.

**Effects of the KoF07-evaluation**

The situation for senior Art Historians has not changed in respect of their workload since KoF07. However, there are some improvements happening in the research environment with the appointment of new research personnel, which is very encouraging. While the KoF07 reported that more academic capacity was needed, the rationale given by the department for a new professor in architecture and design is not as clear as it might be. While a new professor would undoubtedly be of great benefit to the department, staff might want to rethink the implication of a professor with a specific specialization, after streamlining the research profile of the discipline.

The KoF07 made four key recommendations for the Textile section. First, the Textile Section was identified as a ‘golden nugget’ which needed to retain its special identity when it moved to the Faculty of Arts. The move has been very successful but the Textile Section is small and it needs nurturing. Second, KoF07 recommended that a fulltime professor should be appointed. This is still needed. Third, the KoF07 recommended that opportunities for young talented researchers were given and a research fellow was appointed in 2011. Fourth, the need for long term planning was highlighted. This is still needed, as is mentoring of the younger academic staff to help them realize their full research potential.

**Department of Literature**

**General assessment of the department**

The Department of Literature is a strong and self-confident research environment, characterized by many scholars of high competence; it has nine pro-
fessors and six senior lecturers (“docenter”). Productivity is very high and the thematic breadth of research is impressive. A considerable part of the research performed concerns Swedish literature and is consequently written in Swedish. Many publications are not only directed to a scholarly audience but also aim at communicating the research to a wider reading public, e.g., literary biographies. Moreover, several of the department’s researchers are public figures in Swedish cultural life, and they regularly publish in the cultural sections of Swedish newspapers. They also perform many governmental and societal assignments.

In this large department a broad variety of research projects, both in Swedish and in comparative areas, are brought to fruition. A substantial part of the research is carried out as individual projects, but since 2007 six ‘profile areas’ have been formalized around special research groups: (i) 18th Century Studies; (ii) History of Rhetoric; (iii) Empirical Studies of the Reading Process; (iv) Authorial Identity and Sustenance; (v) Literature and Gender; and (vi) Textual Criticism.

The department houses two special sections: the elder “Sociology of Literature” and the newcomer “Rhetoric”. The profile area Authorial Identity and Sustenance lies within the section for Sociology of Literature and History of Rhetoric lies within the section for Rhetoric.

Quality of research

Taken as a whole, the Department of Literature is an academic milieu of a very high standard, given that the extensive (and natural) use of Swedish makes the production partly inaccessible to international scholarship, and that not every specimen can be of the same quality.

Three of the study units deserve to be mentioned in particular, both because of their outstanding potential and because they create an academic milieu that is unique in Sweden. The section for Sociology of Literature has existed for a long time, but it is still the only one of its kind in Sweden and it attracts international scholars. The section and its ‘profile area,’ Authorial Identity and Sustenance represent an interdisciplinary view that continues to develop penetrating new questions and to find new productive fields. The panel finds that the material supplied motivates the designation ‘top-quality’ for the section for Sociology of Literature, if the rating is understood as being synonymous with ‘among the best 10 % in the world within the same research field’.

Textual Criticism (not to be confused with the criticism of authored texts) is employed in practice by several scholars, but it is also – within the ‘profile area’ of that name – made the object of theoretical and methodological discussion. It is, moreover, implemented in teaching from the early stages on, which is highly commendable, since it creates an important awareness of the difficulties involved in using texts and basic analytic concepts such as ‘text’, ‘work’ and ‘author’. The area can be described as reaching an internationally high standard.

Within Rhetoric a diachronic approach is being actively processed into a very promising area of research – intimately connected with literature, but also developing several multidisciplinary strands. The section of Rhetoric is current-
Recalling an internationally high standard and it has a promising future.

**Research environment and infrastructure**
The Department of Literature is well-managed and it clearly functions effectively. The staff appears to be well composed and the PhD students seem to be perfectly integrated. Efforts have been made to create an over-all environment in order to achieve an optimal working climate and good conditions for new projects. PhDs are generally successful with research applications and positions. In recent years, the prosperous economy has been used to provide especially good research conditions for the permanent staff.

**Networks and collaborations**
Efforts have been made both to attract foreign scholars and to encourage PhD students to go abroad. These efforts appear to have been successful and the panel encourages them to be consciously continued.

New cooperative agreements with literary departments at other Swedish universities have been established during the past years, but more cooperation, not least with departments outside Sweden, would unquestionably prove fruitful. The Department of Literature is ambitiously preparing to become a centre of Scandinavian Studies, which would imply a broad international network.

In KoF07, the lack of a consistent plan for establishing cooperative relationships with the foreign language departments in Uppsala was pointed out: no solution to this problem appears to have been found.

**Opportunities for renewal and emerging science**
The Department of Literature has plans for developing research in Scandinavian Studies in collaboration with the Department of Scandinavian Languages, thereby maintaining or even increasing its dual commitment towards general/comparative literature on the one hand, and towards Swedish literature on the other. At this point, Lund University – in cooperation with the University of Copenhagen and several other European departments of Scandinavian Studies – has plans that appear to be more concretely formulated. In the panel’s view the Department of Literature in Uppsala should consider becoming a part of this network.

Likewise, the department wants to develop its competences in subject-based teaching and learning (“ämnesdidaktik”), i.e. the didactics of literature. The section for Sociology of Literature is planning new research within the theory and history of literary publication, and the section for Rhetoric wants to balance its present focus on the history of its discipline with additional projects on modern rhetoric. Long-term goals include a modern form of creative writing-programme. All of these plans seem to demand funding if they are to be developed, but most urgent, in the panel’s view, is that Rhetoric should be given additional research resources, besides the chair which has already been agreed upon by the faculty.
**Actions for successful development**

The panel notes that internal recruitment for faculty positions is considerably greater than external recruitment. Within the period 2007–2010 six individuals with a PhD from Uppsala University were employed in permanent positions and only one with a doctoral degree from another university. The panel strongly recommends that the department take measures to offset this imbalance in the recruiting procedure.

Considering the great number of undergraduate courses within Rhetoric, research within this area should be generously supported in order to develop a corresponding scholarly base. A number of PhD scholarships would be invaluable in establishing a creative research environment where the new theoretical and methodological approaches can be developed.

**Effects of the KoF07-evaluation**

Some of the recommendations of KoF07 have already been mentioned and commented upon above. They will not be repeated here.

In KoF07, it was suggested that the Department of Literature should make efforts to replace individual projects with larger, collaborative projects. This has been efficiently handled by the formulating of ‘profile areas’.

More interdisciplinary efforts were called for, especially cooperation with the language departments. The latter has not been achieved, although the plans for Scandinavian Studies may be a future remedy in relation to the Department of Scandinavian Languages. The development of research within Rhetoric is decidedly weighed toward interdisciplinary or at least multidisciplinary interaction.

KoF07 also suggested more work in the connection between literature, religion and *Lebensanschauung*: this approach has been elaborated and merged with the reading process profile.

KoF07 recommended that Rhetoric be given a chair professorship. This is now happening, and the Rhetoric section has been given a postdoc position (“forskarassistent”).

KoF07 found it imperative that the chair in Literature which became vacant in 2010 should be filled. This has not happened.

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**Department of Musicology**

**General assessment of the department**

The Department of Musicology is a sympathetic, small, but strong and productive research unit. In a regional perspective, it is a highly important institution because of its strong focus on the history of music, especially the Middle Ages and most particularly the 17th century. The use of historical awareness and
reflexivity has led to recognition by and cooperation with prestigious departments at Leipzig and London, and their focus on theoretically well-informed historiography has already created a body of coherent research with strong synergetic possibilities. The research centered on the unique “Düben Collection” at the University Library includes the establishment of an internal database, a linkage to scanned music facsimiles, critical theory and historiography – which is all of particularly high quality. But work in more recent Swedish music history, together with the overall high productivity by department researchers, has helped to confirm the hopes expressed in the previous assessment (KoF07). The engagement in the expanding field of historically informed music theory, emphasized in the self-evaluation, must be welcomed as an appropriate source of development and renewal in a department that is already strongly engaged in music theory, but one which also seems to have the potential for a further strengthening of cohesive ties between the diverse historical research areas.

Otherwise, there are still signs of the transitional state of the Department of Musicology – there are few doctoral students, and while they receive close and positive supervision, they, as well as the permanent staff, appear to be working overtime.

Quality of research
The above-mentioned studies centered on the 17th century were judged by the panel to be of an internationally high standard, and the department’s acknowledged excellence across national borders is also reflected in the cooperation that is beginning with the Royal Holloway (University of London), the Universität zu Leipzig, and the Sorbonne. Work of internationally recognized standard is also seen in studies of earlier and more recent areas, and in the analysis of pedagogical institutions.

Research environment and infrastructure
While the research produced equals or approaches that of larger departments at Uppsala University, it must be noted that the Department of Musicology is barely at critical mass administratively. It was clear to the panel that additional staffing is of great importance. The department has aspirations of reaching out to other partners to broaden the scope of research (the cooperative arrangement with Svenskt Visarkiv is a fruitful example of this). But if the pressed administrative situation could be relieved, the same proactive approach might well be applied to other departments of the university as well as to highly ranked visiting scholars in the music field. It is the panel’s impression that the daily burdens of administration and necessary teaching loads have to some degree sapped the energy of the staff for these interdisciplinary initiatives.

Networks and collaborations
Within the internationally recognized early music area noted above, the aspects of worldwide networking (quite literally, in the Düben Collection Database
Catalogue) and collaboration have clearly been attended to. The researchers from Svenskt Visarkiv also have a recognized international profile. These two areas may prove a stimulus to the remainder of the small group.

**Opportunities for renewal and emerging science**

The department’s focus on the three connected areas of music history, music theory, and music aesthetics should be maintained. However, we may anticipate a future need for a broadening of research areas: music ethnology, the history of popular music, etc., may be of mutual interest to students and staff. As a matter of fact, the department in its self-evaluation seemed to reflect an interest in these areas. What they have not presented, however, is a concretely formulated plan for the decisions necessary to realize these hopes. Such new directions should of course not be implemented in such a way that it would be to the detriment of the excellent work mentioned above; and there again, the lack of personnel haunts the discussion.

**Actions for successful development**

As the department itself states it: "in a perspective of five to ten years the direction of the research activities at the Department of Musicology probably still will be music history, music theory and hopefully, ethnology and anthropology of music". This is not a particularly ambitious projection. But the department also understates what to the panel is obvious: that the quality and quantity of research is already very high; that with the duties of a stressed staff at but not above administrative critical mass; with high undergraduate enrollments and additional ‘distance learning’ teaching, the department might at times feel that the status quo is the best that the future might bring. The panel, as noted above, has a different view. We strongly recommend that the department initiate focused and inclusive discussions among its staff, aiming at the articulation of a detailed plan for the broadening of its research areas.

The department has made a convincing argument for the continuation of its studies in Swedish music history. The panel acknowledges and corroborates the importance of the efforts being done to assure that these studies are carried out with due respect to international scholarly standards and in dialogue with the proponents of appropriate theory and methodological approaches in international research.

**Effects of the KoF07-evaluation**

The Department of Musicology was acknowledged by the previous evaluation panel (KoF07) as a worthy candidate for recognition and support. The assignment of a new assistant professor may be seen as a direct ‘effect’ of this. But the time limitation on this particular position simply causes the problem to recur in short order. A permanent position at the level of the new faculty member (or even higher) would seem to be the only rational alternative to the situation facing this small but deserving faculty research group.
Department of Philosophy

General assessment of the department
The Department of Philosophy is a strong and impressive research environment, which in January 2011 had one chair professor (in practical philosophy), three promoted professors, two senior lecturers, 8 assistant professors and researchers (“forskare” and “postdocs”), and 14 PhD students. The department is presently in an expansive phase: Two new chairs have just been announced, one in theoretical philosophy and one in aesthetics. In addition, two new senior lecturers in practical philosophy have recently been appointed. The department head/chair and the research staff are eager to maintain high scientific quality. A pronounced goal when announcing a new position is to find the best person within a broad area, rather than trying to satisfy a more narrowly defined need. The ambition of the department is to recruit graduate students and research staff internationally. In spite of certain efforts to improve the gender profile, it is still not satisfactory. This problem is also recognised by the department itself.

The researchers are divided into five research groups, each with its own research seminar: (i) Philosophy of language and culture, (ii) Philosophy of science, (iii) History of philosophy, (iv) Practical philosophy, and (v) Aesthetics. The research at the department fits largely within the analytic tradition, but there is also research that is inspired by non-analytic traditions like phenomenology, hermeneutics, post-structuralism, and philosophy in the style of the later Wittgenstein. Several of the groups have substantial interdisciplinary cooperation.

Practical philosophy has developed research cooperation with political science, Philosophy of language and culture cooperates with Uppsala Science and Technology Centre, and Philosophy of science has cooperation with theoretical physics. In 2008, the History of philosophy group received funds for a major research project from the Bank of Sweden Tercentenary Foundation. There are 15 researchers involved with this project, which is based in Uppsala, but it also includes researchers from Malmö and Stockholm. An ambitious international publishing policy, extensive international research networks, and extensive interdisciplinary research cooperation are general characteristics of the research at the department.

Quality of research
The research at the department is generally of high quality. We want to emphasise (iv) Practical philosophy, where some particularly outstanding work has been done during recent years, in particular within formal philosophy (axiology) and meta-ethics. We rate the group in practical philosophy as top-quality research, where this rating is understood as synonymous with ‘among the best 10 % in the world within the same research field’. (iii) History of philosophy is a very strong group, whose research we rate as being of internationally high standard. The research within (ii) Philosophy of Science is also of internationally high standard. The latter group is, however, comparatively small and therefore vul-
nerable. (i) Philosophy of language and culture produces research that is internationally recognized. This group has close international contacts with researchers at the University of Chicago and Åbo Akademi University, and it has produced a number of PhD dissertations during recent years.

Presently, there is a discrepancy between practical and theoretical philosophy with respect to quantity, and to some extent also quality. This is mainly due to lack of research positions in the latter field. This situation will presumably be rectified to a considerable extent with the appointment of a new chair professor in theoretical philosophy. Finally, (v) Aesthetics seems to have become integrated in the department as a branch of philosophy in its own right. The department is optimistic that this process will be finalised with the appointment of the new chair professor of aesthetics.

Research environment and infrastructure
The department provides a very good research environment with adequate facilities. Each of the five research groups runs its own seminar, where staff and doctoral students present their research. Frequently national as well as international guest lecturers are invited to give presentations in these seminars. Occasionally joint research seminars in normative ethics are organized by the practical philosophers in Uppsala and Stockholm.

Although the graduate education is generally successful, it is our view that it would be an advantage if it was made more structured. In particular, the system of individual study plans, as well as that of final seminars (“slutseminarier”) with an external opponent, should be taken more seriously and be used in a more systematic and efficient way than is presently done. We consider that it should be the responsibility of the Chair to make sure that publications are included in the DiVA system, which is not always done at present. Finally, we would like to emphasize the importance of transparency and broad participation, when decisions are made in a department. We got an impression that things can be improved in this respect. Our overall assessment of the research environment is however very positive.

Networks and collaborations
The various research groups have an impressive range of international contacts and collaborations. There is close international cooperation with several world leading research centres. There is also frequent participation in and organization of conferences, as well as exchange of researchers and doctoral students with other international research centres. The department has a successful internationally oriented PhD training programme, which encourages studies at leading philosophy departments in Europe, USA, Australia and New Zealand.

Opportunities for renewal and emerging science
In the self-description, formal philosophy, history of philosophy, meta-ethics and philosophy of physics are mentioned as particularly successful research ac-
The main strengths at the present time are in practical philosophy, history of philosophy and the philosophy of science. Traditionally, however, the Uppsala Department of Philosophy has been a world-leading centre for research in logic and philosophy of language due to the presence of such leading experts in these fields as Stig Kanger, Krister Segerberg, and Sören Stenlund. We feel that there is now an urgent need for the Uppsala department to renew its competence in these areas. Another central area of theoretical philosophy, where the department needs to be strengthened is philosophy of mind.

Hopefully, the new professor in theoretical philosophy will be able to cover some of the areas that are largely missing at the present time. Even after the chair in theoretical philosophy is filled, there will be a need for additional research staff in theoretical philosophy. In order to make such an expansion possible, the department cannot rely entirely on internal funding, but must become more active in searching for external funding as well, for example by applying for large projects in cooperation with other departments, and by applying for EU-funds.

**Actions for successful development**

The research groups are pretty small in comparison with other internationally leading departments in the field. If the Department of Philosophy is successful in searching for external funding this situation can be improved. Improving the gender profile by hiring women, and encouraging women to participate in PhD programmes, can be another way of improving the quality of the research at the department.

To summarize, the Department of Philosophy at Uppsala University is excellent in what it does, but it is rather small in comparison with other internationally leading philosophy departments. There are strategically situated, central areas of philosophy, like logic, philosophy of language, and philosophy of mind, where its research capacity needs to be strengthened. In order to become a world-class philosophy department across the board, the research staff needs to be expanded considerably, especially in theoretical philosophy. Such an expansion would also be a benefit to those areas of research where the department already has internationally high standing or is world-leading.

**Effects of the KoF07-evaluation**

As a result of the KoF07-evaluation the university funded a new postdoc position (“forskarassistent”) in the History of Philosophy.
**Panel 9**

**Scope of the panel’s evaluation:**
Department of Cultural Anthropology and Ethnology  
Department of Archaeology and Ancient History  
Department of ALM (Archives, Libraries, Museums)  
Department of History of Science and Ideas  
The Hugo Valentin Centre  
Department of History  
Department of Economic History

**Introduction**

Our assessment is based on the self-evaluation reports of the departments assigned to us, the statistics provided by the evaluation project, and checks of the references to publications given in the self-evaluations. The site visits also provided useful evidence including inspection of the premises and access to some additional publications. The interviews and discussions with members of the departments were very valuable; we are grateful to the departments for the time and effort they put into this exercise. The written material provided by the departments was carefully prepared. However, the panel felt that more comprehensive documentation provided by the evaluation project would have been helpful. For example, basic information on the size and structure of individual departments was often unclear, and complete lists of the staff members were missing (and not part of what the departments were asked to provide in their self-evaluations). This important information also proved difficult to obtain once the panellists arrived on site. It is not easy to achieve a well-founded judgement of a department’s research profile solely on the basis of site visits, self-assessment reports and a small and selective list of some publications. A clear overview of each department’s membership and output, easier access to publications, as well as clearer instructions, would have improved the research evaluation and brought it more in line with the principle of peer reviewing in the humanities. Due to the nature of the assignment, our comments concerning the research publications must perforce remain quite general.

It is difficult to measure research in the humanities along the same lines and norms as are customary in the sciences, but the panel has even so followed the instructions given by the evaluation project. Two remarks have to be made. First, we emphasise the importance of national and international publications. Swedish research in the humanities ought to be published both in Swedish and in foreign languages. Second, we appreciate monographs, edited collections and articles in scholarly journals; all these publication channels are valuable and relevant for scholars in the fields we assessed. We took all of these into considera-
tion in our assessment of the standard of research being conducted at Uppsala University.

**General conclusions**

In general, the physical environment of the departments seems to be highly satisfactory, but some departments need more space. Facilities also seem appropriate. The short distance from Engelska Parken to the major research library, Carolina Rediviva, and its archives is of course a benefit. The quality of research and the level of productivity of the departments are generally quite impressive, especially when one takes into consideration the high teaching load of the tenured personnel, which includes the supervision of PhD-students. Moreover, the almost universal willingness to engage in interdisciplinary projects is laudable. The panel was also very impressed by the fact that many departments, instead of simply applying methods developed within the sciences or social sciences, clearly enter the field of interdisciplinary research from the point of view of the humanities, thus promoting and expanding their own scholarly traditions.

The publication profile of the departments seems to be relatively well-balanced. The panel noticed that high-level international scholarly publications are produced in all units under evaluation. When it comes to public dissemination of research, some of the departments are quite active in this respect, not only by the way of publications but also through other activities. For example, we think of ethnology (school forum and presentations on racism), Hugo Valentin Centre (input into policy-making with regard to Swedish minorities) and economic history (business collaboration), among others. Even amid the push to publish in English many studies concerning Sweden deserve to be published in Swedish in order to effectively disseminate the results and have an influence on public debates.

Panellists were quite impressed by the quality of some of the books published by Uppsala University. However, since many of these publications are not widely marketed or distributed outside Sweden their international impact is likely to be considerably diluted. The panel feels the lack of a competitive university press with an international profile at Uppsala represents a lost opportunity both to showcase the work of scholars at Uppsala and to forge connections with scholars in other countries (a true university press would, of course, publish work by foreign scholars as well). It is a challenge to ensure broader international presence for key Uppsala publications, and we therefore recommend that this issue be addressed. The panel discussed whether one option would be for Uppsala University to enter into collaboration with major foreign publishers. Alternatively Uppsala could found a university press that seeks to compete with fine university presses like Cambridge, Oxford or Harvard. Concerning electronic publications, strongly recommended by KoF07, the panel thinks that university press could focus as much on electronic publications as on printed publications so as to ensure a wide distribution of the research results.

Some structural problems were raised repeatedly in our discussions with de-
partments. The career path structure appears to impede full exploitation of the research potential of the departments and centers we visited. The panel learned that mid-career staff are expected to spend up to 75% of their time on teaching. This limitation on research time clearly hinders the university’s research quality. It seems a waste not fully to exploit the proven research capabilities of this group of competent staff who are at the prime of their research lives. At the same time this structural obstacle has been reduced, or even overcome, by some of the departments and centres we visited. Often, the teaching load of mid-career staff has been reduced because the departments have succeeded in attracting external funding which they have then used to give mid-career staff more time to do research. However, this raises the question whether such solutions are in fact optimal. Certainly, achieving external funds is not cost-free: some of the time and effort needed to apply for external funds could be channelled directly to research. Therefore, we recommend that mid-career staff be allocated more time for research. It is our belief that the current staff structure is a hindrance to raising the research quality at Uppsala.

However, the panel does also recognize the importance of external research funding if the departments aim at increasing and strengthening their scholarly performance. In view of the strong emphasis at Uppsala University on external funding, the panel was surprised to find that the briefing gave no information about the share of European funding either at the departmental level or at Uppsala in general. The impression the panel formed was that both applying for and obtaining funding from the European framework programs or from the European Research Council was rare. It seems to us that this is an area that could be explored more fully by Uppsala University.

Lastly, we recommend that internationalisation continue to be pursued and strengthened at all levels. As mentioned above, one of the areas concerns publications. There are other areas: for example, the KoF07 report suggested that international academic experience be a condition for tenure. While this panel hesitates to agree with this, we nevertheless encourage strengthened mechanisms for students and staff to widen their international experience and participate in foreign scholarly activities. It seems to us that Uppsala could play an even stronger role in international academic fora than it does at present.

Department of Cultural Anthropology and Ethnology

General assessment of the department
Since 1996 the department has embraced two disciplines, each with a distinct identity but sharing many theoretical and methodological approaches, includ-
ing a firm foundation in ethnographic fieldwork. When it comes to research material, cultural anthropology by its very nature has a more pronounced international profile, whereas ethnology’s focus is somewhat more local. Also, the questions asked of the research material tend to differ. The strength of the department is that it has achieved a high degree of complementarity between these disciplines, while at the same time it honours their diversity and wide-ranging research profiles.

Quality of research
The cultural anthropologists have particularly strong research programs on the political ecology of the circumpolar North (Sami and other indigenous people in Sweden and the Russian North), democratic culture in West Africa, and medical anthropology (based on research in Southeast Asia). There is an additional emphasis on conflict resolution. The publications in cultural anthropology are particularly notable and have won two prestigious prizes including the Margaret Mead Award jointly offered by the American Anthropological and the American Society for Applied Anthropology. Research on the circumpolar North and Africa within cultural anthropology is at an internationally high standard. In ethnology, the School Forum represents a strong activity based on high-quality multidisciplinary research, especially on children. They are doing very good work and it seems to be internationally recognized. We also expect that the promising gender profile within ethnology and the very good gender research will further improve with the new chair in ethnology.

Research environment and infrastructure
The department is responding well to the challenge of honouring the two disciplines’ distinct identities while at the same time creating a unified research environment. At first sight the contrasting approaches of the two disciplines could be crudely characterised as Sweden (ethnology) versus the world (cultural anthropology). But the reality is more complex. The geographical range of the cultural anthropologists is indeed impressive, backed up with fieldwork in Bolivia, Siberia, Burkina Faso, Cambodia, etc. But the ethnologists too go beyond Sweden with research projects – or planned projects – in England, Spain and Turkey.

We felt that the distinction between the two disciplines was being interpreted in a positive way. Though ethnology seemed smaller and less forceful, it is not only a respected tradition in Sweden and the Nordic countries, but it also contributes a historical awareness which is not so evident in cultural anthropology. The apparent imbalance in the briefing document, which appeared somewhat to slight ethnology, improved on the site visit, and several examples emerged of fruitful collaboration, such as a joint course on ‘Culture, society and ethnography’ on the undergraduate level.

As in many other departments, strong research environments tend to depend on individual staff members, and policy change may be needed to ensure (or
at least address the question of) their sustainability when key individuals retire. Both sections are undergoing a generational shift, with the ethnologists having just hired a new professor and the cultural anthropologists already anticipating the retirement, at an unknown date in the future, of a key staff member. A potentially serious structural problem stems from the fact that the department is unable to offer positions to recent doctoral students and suffers from a lack of personnel at the middle level, i.e., postdocs. This issue has engendered considerable frustration in the department. We were given a very positive report by the PhD students, who feel that they are ‘privileged’, and that they receive a lot of attention and guidance. Anthropology and ethnology students cooperate and share seminars pertaining to methodological and ethical issues and to urban studies. The department seems attractive to visiting foreign researchers, with two recent long-term visitors from the USA and a third (a Fulbright scholar) under negotiation. Since our visit, ethnology has advertised an opening for a university lector.

**Networks and collaborations**

Cultural anthropology’s worldwide coverage is very impressive, with fieldwork matched by formal agreements with local institutions, especially in Russia and at several sites in Africa. Activities in these regions extend beyond pure research to include public engagement. So for example the cultural anthropologists work to influence development policies, especially in West Africa, while the ethnologists use their research on schools and education in modern Sweden to advocate for the right of every child to have an education and to combat the increasing tendency toward cultural segregation in Swedish society. Cultural anthropology is engaged in a series of European joint ventures, including École doctorate program, the ADAP network and ten very active ERASMUS agreements. Ethnology has developed collaboration with King’s College in London, which, it is hoped, will survive the retirement of its chief promoter in the department. Ethnology has developed a joint seminar with Stockholm University and Södertörn University College as well as with the university college in Gotland, all of which boast strong ethnological/folkloristic milieux. Cultural anthropology would like greater cooperation with archaeology, and this should be encouraged, especially within polar and African studies.

Both Ethnology and Anthropology researchers publish in a judicious mixture of Swedish and English which means that they will be able simultaneously to participate in international networks and speak to (and cooperate on) issues of local concern.

**Opportunities for renewal and emerging science**

The diverse yet related approaches of Cultural Anthropology and Ethnology are a strength and in the future they should continue to cooperate while still cultivating their differences and distinct identities. They should also continue to pursue collaborations with other departments and centres. The book which
won the Margaret Mead Award (see ‘Quality of research’ above), was based on a PhD thesis supervised and defended at this department and also supported by the Hugo Valentin Centre. This is an excellent example of collaboration between the two institutions.

**Actions for successful development**
Apart from those already mentioned, there are other opportunities for collaboration. For example, the university’s network on Sami studies (Uppsam) is a valuable interdepartmental initiative and there is potential for the department to take greater advantage of its strong work in this field, which could also be a springboard to develop more collaboration with archaeology.

**Effects of the KoF07-evaluation**
Since KoF07, the number of PhD students has apparently been reduced from around 30 to around 15. Since the students gave the department a very strong endorsement, this should presumably be seen as a positive development.

**Other issues**
The self-evaluation report was written in two separate sections, giving the impression of two quite separate fields uncomfortably inhabiting one department. This was not, however, what we found when we actually visited the department. This department has found ways to cooperate without diluting the distinctive identities of its two parts and we hope this will continue.

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**Department of Archaeology and Ancient History**

**General assessment of the department**
The Department of Archaeology and Ancient History consists of the following disciplines: a) African and Comparative Archaeology; b) Nordic Archaeology; and c) Classical Archaeology and Ancient History. Egyptology is also part of the department. Each of these disciplines has initiated and is involved in a number of research activities, some of which cut across two or more disciplines and cover an admirably large geographical area, time span, and range of topics. This is a well-functioning department, whose constituent parts make up a coherent unit. Even though the individual disciplines pursue a variety of research goals and research programmes, there is a clear sense of co-operation as regards the construction of a common infrastructural base as well as the formulation of long- and short-term research strategies. In fact, part of the key to the department’s success seems to be that its various researchers share a number of theoretical and methodological goals. Willingness to create synergies and personal enthusiasm on the part of the department’s staff are clearly in evidence.
Research is divided between landscape archaeology, GIS analyses and excavations. The department is famed for a research profile that brings the material and written historical record into a fruitful interplay. The material evidence is combined with the evidence of the written texts with a view to shedding light on a number of macro-historical questions that also have current relevance. Especially notable topics of research are: historical ecology, urbanism and agro-urban landscapes, and human responses to environmental change. The subfield of GIS-based landscape archaeology informs almost all of these research directions, reflecting the fact that, while this department is anchored in the humanities, it also draws inspiration from the natural sciences.

Ancient History is in close and constant collaboration with archaeologists, and the same is true of the re-emerging field of Egyptology. Despite their small number the staff of Classical Archaeology and Ancient History working especially with history make a substantial contribution to this department, and that contribution can only grow stronger with the newly-appointed professor. The department has proved successful in securing external funding, and it is to be hoped that it will further develop that ability in the future. It is also distinguished by its willingness to interact and collaborate with specialists from other departments both within and from outside its own faculty/domain (Agora is a shining example in this area). The publication output is impressive, qualitatively as well as quantitatively. African and Comparative Archaeology, and Classical Archaeology and Ancient History, have a strong, international publication profile, though the same could be said of the entire department.

Quality of research
The transdisciplinary project The Urban Mind is not only innovative but also has the potential to become a world-leading project. One therefore wonders why its research findings are not published with an internationally renowned press. The GIS-based landscape archaeological project (including its technical infrastructure) enjoys international recognition and has the potential to develop into a top-quality, interdisciplinary research endeavour. The field of Classical Archaeology and Ancient History is distinguished by its high international publication profile and it achieves an internationally high standard.

Research environment and infrastructure
The composition of the staff is very satisfactory and boasts a good gender and age balance. The staff members have established a series of fruitful co-operative activities, particularly around the build-up of the GIS laboratory. Further funding of this relatively costly undertaking will no doubt increase the department’s research output. All in all, the department enjoys a good research environment, and is doing a good job of negotiating generational change. One new Chair has been appointed and two such appointments are expected to occur within the next few years.
Networks and collaborations
The department has been successful in creating a number of international networks. In addition, not least through their fieldwork in a number of countries, the staff have established extensive webs of collaboration with colleagues from within and outside the discipline of archaeology. Several research topics not only bring the archaeological and historical disciplines together, but ensure interdisciplinary co-operation beyond the department. These include: the phenomenology of religion, studies of cults in context, archaeological narratives, gender studies, and the study of democratic institutions.

Opportunities for renewal and emerging science
Within the last few years the department has seen a marked renewal of its activities, especially those centred around Landscape Archaeology and the World Historical Ecological Network (WHEN). Clear evidence of this is the Rethinking Human Nature project. These initiatives represent new and exciting directions, and at the same time unite the different archaeologies of the department into a common scholarly endeavour.

Actions for successful development
The department has made well-coordinated efforts to attract external funds. As a result, African and Comparative Archaeology possess a sustainable base. However, the WHEN project, which could have a major international impact, needs all the support it can get if it is to realize its very great potential.

Effects of the KoF07-evaluation
Finding the disciplines to be rather atomized, the KoF07 report recommended a greater degree of cooperation between them. We find that this goal has been accomplished successfully, at least in part through sensible and forward-looking use of the resources that came as a result of the KoF07 evaluation. These resources have been used to develop new research initiatives and projects that both have great international potential and promise to strengthen internal co-operation.

Other issues
The department has been successful in producing new and talented doctoral candidates. The staff demonstrate a very high engagement and involvement in scholarly activities while at the same time they are mindful of communicating their research to a broader public.
Department of ALM (Archival Science, Library and Information Science, Museology and Cultural Heritage Studies)

General assessment of the department
The Department of ALM consists of three disciplines, Archival Science (A), Library and Information Science (LIS), and Museum and Cultural Heritage Studies (M). The common base for the disciplines is information and knowledge acquisition, organization, preservation, retrieval, and mediation of documents and artefacts. The ALM department is relatively young, established in 1995 with the library education program. The ALM graduate program started in 1999. Since then research activities have developed rapidly, the first PhD thesis was presented in 2007, and the department has grown. It now has three professors including its first Chair, established in 2011. The research projects at the ALM department are as follows:

- Archival Science: appraisal strategies,
- Museum and Cultural Heritage Studies: ethnographic research in cultural heritage,
- Library and Information Science: knowledge organization, bibliometrics, information behaviour and learning processes, copyright and intellectual property, and public libraries.

The department has been very successful in getting external funding for research projects especially in LIS. However, the research projects tend to be connected to individual researchers and their external networks rather than being conducive to larger collaborative projects within the department. In addition, the fact that the higher degrees are only possible in LIS results in a research profile dominated by that discipline.

Quality of research
The research is internationally recognized and of high standard, as is shown by several research projects on copyright and intellectual property that have received external funding even at the European level. The research is reported in both national and international peer-reviewed journals and books and the researchers have been active in attending international conferences and presenting their research. The main research projects, which deal with copyright and intellectual property, e-science infrastructures, and evidence-based library and information practice, among other topics, include many angles of potential importance in the future information society. For example, it is clear that the research project on intellectual property in a global context has the potential to have considerable impact. This department’s presence on the international research scene is important in developing the research further.
Research environment and infrastructure
The research environment is dependent on individual scholars’ activities but has clearly grown since the previous evaluation. The department belongs to the Nordic research school in LIS (Norslis) which is an important infrastructure for doctoral students coming from a small department like this one. The research environment seems to foster innovative and creative projects but needs to achieve a better balance between the three disciplines in the department.

Networks and collaborations
The LIS section of the department is engaging in international networking, differentiated according to topic. So while some topics (such as copyright research) require an international network, for others Nordic and national networking will do. At present, no courses are taught in English and hence there is a lack of capacity to attract students in Library Science from outside the Nordic countries. This seems a bit of a lost opportunity. We also believe that the department could build more on its already commendable program of long-distance teaching.

Opportunities for renewal and emerging science
The first generation of researchers in the department comes from other humanist disciplines, which has given the research an interesting but somewhat unusual direction for LIS and Museology research. However, the department has managed successfully to foster new doctoral research on topics closer to core LIS research, and this is likely to reach a critical mass of LIS research in the near future, provided economic resources allow it. In addition, the combination of the three disciplines, Archives, Libraries and Museums provides highly interesting opportunities and should be developed by encouraging and recruiting PhD-students representing all three disciplines.

Actions for successful development
Strong, focused research in key areas of LIS, Archival Science and Museology should be undertaken. It will be easier to achieve where fruitful cooperation can be established with other departments at Uppsala University as well as with other LIS and Museology institutions in Sweden. The combination of the three disciplines provides highly interesting opportunities that can, we believe, be exploited further. One potential way forward may be to build on common needs for all three areas, such as challenges in the area of knowledge organization, user behaviour, and digital preservation and develop research in such areas.

Effects of the KoF07-evaluation
The department has established research in the LIS area fairly recently. However, the recommendation of the KoF07-evaluation that the department should undertake research in more core LIS research areas seems not to have been followed up sufficiently. Still, current doctoral work is already more in line with this recommendation, and it is to be expected that this will continue.
Other issues
LIS is a science whose research results have an immediate and practical relevance for society in that they can be applied for the benefit of users of archives, libraries and museums as well as in the management of online resources that these institutions offer and are expected to offer in the future. The panel hopes that the expertise in this department is being tapped by the university as it works to develop its own strategic relationship to the new Information Society.

Department of History of Science and Ideas

General assessment of the department
Uppsala University has long been important for the development of history of science and ideas as a scholarly enterprise. Solid and respected, though initially somewhat local in scope, the department started to become internationally significant in the 1980s and 1990s. Over the years, the staff have succeeded in creating, as their evaluation document puts it, a dynamic academic environment with several distinct research profiles (history of science, history of medicine, cultural and media history, intellectual history) within a more or less common intellectual framework. The two current Chairs (one at the department and one at the semi-autonomous Office for History of Science), as well as many of the senior and junior scholars, are producing work of high international quality that is helping to define and explore new research frontiers in the history of knowledge. The staff collaborate both with foreign scholars in their fields and with Swedish researchers in a variety of disciplines. In fact, the department has been successful at creating an environment to which scholars want to come, often bringing their funding with them. During the last five years fourteen externally funded projects have been placed at the department. The department has a key role within Uppsala University, because the history of science and ideas can provide significant meta-insight for all other disciplines. Members of the department also fairly often contribute to popular books, magazines and debates aimed at the general public in Sweden.

Quality of research
Research quality at this department is clearly very good and has for some time been of an internationally recognized and internationally high standard. Some research, notably in the history of science and medicine, are even of top-quality. The fact that the most recent book of the just retired long-time holder of the Chair in history of science and ideas has been translated into seven languages, and that, during recent years, she has received no less than four major academic or semi-academic awards, is very impressive indeed. The department is cur-
rently the leader of its kind in the Nordic countries, and it has the potential to become one of the world’s key centres for the history of science in modern western culture.

Research environment and infrastructure
The physical space seems adequate to the department’s needs. The fact that the whole department (including the Office for History of Science) is housed together is clearly conducive to dialogue and scholarship. Periodic departmental seminars in a well-appointed seminar room, as well as a coffee room, are an encouragement to conversation and perhaps collaboration.

Networks and collaborations
The departmental report stressed interdisciplinary work carried on individually. Based on what we know of the department this seemed to understate the amount of collaborative work actually being carried on in the department, within the university and internationally. The Chair professors have an enviable record in initiating or co-initiating highly successful collaborative projects. These projects have been thematically and methodologically of the highest international standard; and they have generated a steady stream of published results and well-trained new young researchers. One of the most successful in this regard is the so-called VTI-program, on the relationships between science, technology and industry, which involved 12 PhD students and a number of senior researchers from four disciplines at the Royal Institute of Technology, Stockholm, and at Uppsala University. Among current collaborations we especially note the international networking program ‘Knowledge, Transitions and Scientific Change’ carried on with Cornell University, the Max Planck Institute for Social Anthropology and several other major institutions. At the same time, the department demonstrates that there is no single road to top international scholarship. Flexibility and an understanding of local talent, resources, and international culture should determine a department’s strategy for achieving excellence. In this department’s case, a mixed economy of collaborative research groups and individual or small-group research may end up being preferable to a one-sided preference for large collaborative projects, even though the latter may bring in significant amounts of money.

Opportunities for renewal and emerging science
The department did not express any clear strategies for renewal either in its document or in the interview with the panel. That having been said it has clearly discovered a fruitful way of doing cutting-edge scholarship, notably at the intersections of the history of science, Science and Technology Studies and cultural history. Renewal seems to be an organic part of what this department does. We would also like to stress that, in contrast to many other departments, the Chair professors are still mid-career scholars. More structured cooperation between the department and its Office for History of Science and between the
professors may be a way for further renewal. New arrivals in the department also have the possibility to renew, not least the side of the program devoted to intellectual history beyond the traditional focus on “great Western European thinkers”. We noticed that most books and PhD dissertations have up until recently been published in Swedish (and often on Swedish-related topics), but that more and more is published internationally and that the newer doctoral students also write papers and/or theses in English.

**Actions for successful development**
This is a rather small department. It could certainly benefit from one or two more assistant professors [forskarassistenten] or tenure track positions. The department has recently lost (to retirement) the leading scholar in medical history in Sweden; at least one of these new positions could conceivably be directed towards this field of research. In its written statement the department expressed a concern about mid-level staff (associate professors and lecturers) spending too much of their time teaching. This issue was reiterated in the meeting with the panel. Mid-level researchers are crucial for successful research renewal, and both the department and the university need a strategic plan that would make it possible for these people to become productive scholars as well as teachers.

**Effects of the KoF07-evaluation**
The department did not receive any resources attributable to the previous evaluation.

**Other issues**
The gender-power balance within the department is not optimal. Both permanent Chairs are men and the promoted professor is a man, too. Should the four senior lecturers who are associate professors [docenter] apply for promotion to the rank of full professor and succeed, the department will then have seven male and no female professors. According to data available to us during the visit, most (75%) of the current PhD-students are male. However, if we take into account all forms of employment, the gender situation within the PhD-program in history of science and ideas is equal. The department has several very active and competent women among its staff, who hopefully will be promoted and share the task of directing research in the future. The panel was pleased to learn that the leadership of the department was fully aware of the importance of this issue.
The Hugo Valentin Centre

General assessment of the unit
HVC is a young unit, created in 2010 by merging the Centre for Multiethnic Studies with the Program for Holocaust and Genocide Studies. Because it is an independent research centre and not a department it has neither an undergraduate nor a PhD programme. However, it plays a major role in PhD training and beginning in the Fall of 2011 it will also have a MA-Program in Holocaust Studies.

Its main research areas (Holocaust and Genocide Studies, Balkan Studies, Minorities in Sweden including Jewish History) are linked by the common theme of ethnicity and relations between ethnic groups, arranged along the spectrum from the most quotidian to the most extreme contexts. Research focuses, on the one hand, on minority politics; on the other on violence and reconciliation between ethnic groups. These themes are, however, interrelated in a mutually enriching way. They are internationally highly relevant and quickly developing. In addition, they are important for today’s societies and politics and for some areas of Swedish society in particular. The Centre’s researchers often advise on policy issues, both in Sweden and abroad. They are thus in close contact with, and reach out with their research results to political institutions as well as to a broader public outside the academic community.

Due to the above-mentioned merger of two different research units, researchers in the Centre come from a number of disciplines and focus on different regions and aspects of interethnic relations. However there is a unity in their approaches that seems to come from within, not to have been imposed from without. A strong point is their people-centred approach which allows even quantitative data to serve humanistic goals. The Centre seems to have succeeded in creating synergies and a strong, dynamic research environment. They have also succeeded in acquiring a considerable amount of external funding.

Quality of research
Research at the Centre is rooted in a global vision, though focused on local phenomena. The researchers’ local knowledge and language competence, in combination with advanced theoretical approaches, supply the preconditions for outstanding research results. Minority studies, especially research on language, politics and planning, are of high quality and highly relevant on a national level in relation to on-going political processes. Moreover they successfully meet both Swedish and international standards. The panel believes that the Balkan Studies and Genocide Studies being done at the Centre are at an internationally high standard, and have the potential to become top level. The Margaret Mead Award for one researcher’s monograph represents one of the world’s most prestigious prizes in anthropology. This Centre delivers very good research value for money. Our positive view of the quality of research done at the Centre cor-
responds to the evaluation of the KoF07. Since then, the HVC seems to have succeeded in deepening and further developing its research profile.

**Research environment and infrastructure**

We met a large number of researchers who demonstrated an unusually high level of collegiality, intellectual cohesion and enthusiasm for their work. While it is true that, as a research centre, they are not overloaded with teaching, they use this advantage well. Seminars include not only research, but also discussion of research proposals. The Centre is, to a large degree, dependent on external funding, but at the same time it is very successful in attracting researchers from other institutions and also from abroad; undoubtedly scholars from outside who bring their projects (and funding) here profit from the positive climate and high standard of research at the Centre. Perhaps due in part to its short history and the continuous flow of researchers in and out, the Centre has a comparatively young age structure. There is a good gender balance in the staff. The move to the Humanities Centrum at Engelska Parken seems to have contributed to good working conditions at the Centre and reinforced and facilitated collaboration with other departments.

**Networks and collaborations**

Thematically, the Centre has an international orientation and great outreach. It participates in or has initiated a considerable number of networks with both a Nordic and an international scope (e.g., NAMIS, Uppsam, Judarna i Sverige, TRAST). The Centre has its own publication series but its staff also publishes extensively with international publishers and in international journals. A considerable share of the publications is in English, but the mainly Nordic issues are presented in Swedish and Finnish.

PhD students attached to the Centre are also affiliated with one of the regular departments. Doctoral students have two supervisors, one from each place. Intellectually and in terms of networks, this is a great advantage, and we heard the Centre mentioned in several departments, always very positively. However, in terms of bibliometrics and other quantitative measures, the Centre suffers from this arrangement as its staff-members do not receive credit for the PhD students they help to train. Though the Centre seems to accept this with equanimity, it would be good if the university could find some way round this problem.

**Opportunities for renewal and emerging science**

The HVC’s status as a research centre seems ideal and offers obviously excellent opportunities for high-quality research. The researchers at HVC have a clear conception of the future development of their research areas, which include, among other things, comparative approaches to genocide studies, reconciliation studies, and, in the field of minority studies, problems of language preservation and revitalization in the context of new Swedish Minority legislation.
To expand studies on genocide and reconciliation in the direction of the study of secondary trauma, as is currently envisaged, seems a plausible step to take and promises good and bold future development. However this development entails a challenge to the common theoretical framework of the diverse research areas. Up until now, theories about collective identities and ethnic relations have formed a common frame for all research done at the Centre. The integration of trauma studies expands and challenges this frame. This will require continuous reflection and development of shared theoretical notions and methodological tools.

**Actions for successful development**

The Centre has been very successful in attracting external funding; yet it seems not to have succumbed to the fragmentation that sometimes afflicts programs build almost entirely on ‘soft money’. There is currently no EU funding, but there is a strategy to acquire EU-funds in the future. We encourage the further development of research networks as a way to strengthen collaborations with other institutions and with individual researchers both inside and outside the university.

A strong renewal initiative is the investment in the new Masters in Holocaust and Genocide studies. First, this will offer the chance to recruit young researchers, and improve the ability of promising MA students to write project applications. Second, the MA programme may help stabilize the personnel structure as it will give researchers who temporarily lack access to external research funding the opportunity to teach. Third, it may contribute to further internationalization, as all courses will be taught in English. This in turn will give the programme the potential to attract international students. Fourth, it will be an additional platform for collaboration between researchers from different subject areas.

**Effects of the KoF07-evaluation**

The positive evaluation the KoF07 gave the Centre seems to have helped it to prosper and further develop its research activities, although only one concrete measure was mentioned as being a direct consequence of the evaluation (a grant to the Balkan Studies group to develop database-related methodologies). The KoF07 evaluators recommended increasing the number of permanent positions but we note that the number of permanent staff is still comparatively small. We support the idea of adding to the permanent staff in order to create more stability and allow the research done at the Centre to develop within a longer time frame. A further measure to make the Centre’s structure more secure might be to make arrangements for staff from other departments to spend sabbatical periods at the Centre. Both of these measures might have positive effects on the Centre’s own research.
Other issues
The panel members were impressed not to hear complaints during the site visit about the Centre not getting credit for the PhD-theses which are written there. Instead, this was presented as an example of fruitful collaboration with other departments. The panel was especially grateful to receive detailed information about the organizational structure of the Centre and a comprehensive list of research projects, both on-going and still in the application pipeline. This facilitated the task of the evaluators considerably.

Department of History

General assessment of the department
The Department of History, which is the biggest department of the Faculty, has a clear international profile, and the scholarly expertise of the staff members covers several thematic areas. According to the documentation provided to the panel, chief ones are: a) Citizenship, nationalism and Jewish Studies; b) Consumption and manifestation; c) Gender and work; d) History of education; and e) Global history. The staff members do research that is of central importance to the wider scholarly community, especially in Early Modern European history, American history and South Asian history. The department has had notable success in bringing Swedish history into the mainstream of international historical research. Although the department somewhat undersold itself both in the written and the oral presentation it is evident that the research carried out by the department is very strong nationally as well as internationally. Cooperation with other departments, other Swedish universities, and scholars abroad enhances this. The gender and age profile of the department is promising though more female doctoral students would be desirable.

Quality of research
This is a very good department. In particular the research in global history and the early modern period is of a very high international standard. The fact that one of the professors in the department was made a Wallenberg Scholar, the only humanities scholar in the whole country to be honoured in this way, indicates not only her excellence as a historian of early modern women and gender, but also the dynamism of the research milieu this department has been able to create. The department’s early modern history is in many ways of top-quality with great international impact.

Research environment and infrastructure
The staff profile is good as far as age is concerned, while it could be improved in relation to gender on the senior, junior and especially on the doctoral level. Im-
balances at the senior and junior faculty level may be able to be addressed as re-
tirements open up the possibility of new hires, but the issue of doctoral students
may be more challenging. According to the department it used to have many
more doctoral students, a higher proportion of whom were women, before the
Graduate Education reform of 1999. Whether or not the present gender imbal-
ance among PhD students is a result of the reform is beyond the capacity of
this panel to say. However, the panel was pleased to hear that the department is
aware of the problem and is working to improve it.

The intellectual research environment seems to attract foreign students and
scholars, and the Gender and Work (GaW) project has specifically allocated
funds for visits of up to three months by foreign scholars. The physical research
environment could be improved by allotting more space to the department so
that the department can better accommodate visiting scholars.

**Networks and collaborations**
The collaboration profile of the department is strong. The department cooper-
ates and carries out projects with other departments and centres of the uni-
versity, with other Swedish universities, and with scholars and institutions in
Europe, USA, and Asia. It participates in several national, Nordic and wider
international networks. Not only the top-quality Oxford–Uppsala Programme,
but also other important international networks on Jewish history, consump-
tion history and environmental research, which is of importance for research in
global history, are highly relevant, at the same time as the GaW project is linked
to comparable projects in the U.K. and the Netherlands.

The department’s strong international connections are also demonstrated
by department members’ publications, many of which are co-authored with
scholars from outside Sweden, or appear in major collections or scholarly jour-
nals published in Britain, France, Germany and the U.S. On a national level the
department has joined with Stockholm University to supervise doctoral work,
each university contributing in the field in which it is strongest. Finally, on a
local level, the department enjoys good working relationships with the other
departments working on historical subjects and fields (ancient history, history
of science and ideas, economic history); such relationships and collaborations
build on the strength of each department while enhancing their common iden-
tity as historians. SALT, which is administered by the department of history, is
one of the local instruments intended to create wider national and international
contacts and capacities for researchers and MA students.

**Opportunities for renewal and emerging science**
The GaW project has the potential to produce results that will change how we
look at work and gender, and create new theories and paradigms. We find the
GaW database to be a highly innovative and valuable project which represents
both continuity and renewal in research. The database systematically gathers
results from the work carried out within the project, but it will also offer an
opportunity for other scholars to utilize the research data. By allowing researchers and students to access otherwise rather inaccessible source materials, the project will serve a wider scholarly community. The database could very well provide a prototype for a digital research infrastructure for humanities, which enables contemporary and future scholars to build upon and enhance the archival research done in a project.

Members of the department have played key roles in a number of international debates, for example on state-building in the Early Modern Period, military history, enlightenment culture, legal history, and gender history, which both gives the department a strong international profile beyond the Nordic countries, and opens up new routes to renewal.

**Actions for successful development**

Apart from points already mentioned, other new arrangements are under consideration. The department is making plans to better integrate students on a masters' level into research projects. These initiatives involve their own students, students from other related departments at Uppsala and students from abroad. The expectation is that this will have a positive influence on the research activities of the department. The department is also hoping to increase its commitment to transnational, global and comparative history, in line with the best history departments in Europe and America. These efforts seem both sensible and commendable and should be encouraged.

**Effects of the KoF07-evaluation**

The department was disappointed with the previous evaluation, and found it neither constructive nor helpful. However, after the KoF07 report the department engaged in a good deal of self-scrutiny, and worked hard to overcome the reputation for being overly self-congratulatory which, rightly or wrongly, some department members felt had contributed to the negative assessment. Due to the evaluation the department received no additional resources from the university; however, to its great credit it has aggressively pursued external funding. The panel is very impressed by the department’s success in mounting no less than thirty-three funded projects in the last five years.

**Other issues**

As mentioned, we find the database created by the GaW project to be of high value. Therefore, we strongly recommend that the university allocates the necessary funds to maintain and ensure the long-term preservation of the database. We also agree with the suggestion from the staff that the university supports the language centre to facilitate writing in English. This will make it easier for researchers on all levels to communicate their research results to an international audience.
Department of Economic History

*General assessment of the department*
The department is one of the most important centres in Europe for the study of Economic History. It has a strong international profile and considerable repute across Europe, and clearly reaches an internationally high standard in terms of research. It is organized into three main research fields: first, general Swedish and international economic and social history; second, research concerning the economic history of work, labour markets and welfare policies; and third, financial and business history. This is a cohesive, well-functioning unit that clearly supports its junior staff and promotes their professional careers.

*Quality of research*
The high quality of the research is evidenced by publication in internationally recognized refereed journals such as *Business History* and *The Journal of European Economic History*, and *inter alia* by a well-received recent anthology on the Swedish Financial Revolution published by Palgrave Macmillan. The work of this department is essential reading for anyone wanting to understand the last two hundred years of economic history in Northern Europe.

*Research environment and infrastructure*
The physical environment is very conducive to productive interaction and the proximity to the Library provoked envy in the panellists. Structures have been created to encourage scholarship; we were especially impressed by the group tutorial, by the directorship of graduate studies, and by the fact that graduate students were encouraged to attend departmental seminars as well as to present parts of their theses. The graduate students seemed active in the department and to interact well with their senior colleagues. We were impressed by the fact that 70% of the doctoral students in the department were female.

*Networks and collaborations*
The department is very well networked nationally and internationally. The panel particularly noted the project “Modernisation and Mobilisation: State, Nation and Gender in Europe 1600–2000”, currently being conducted in collaboration with the faculty of Modern History at Oxford University. In addition the SALT-SA programme, being co-hosted by this department, has brought in researchers from across Europe and the United States. The department is also engaged in an on-going program of seminars and other collaborations with a number of Uppsala departments, including History, History of Science and Ideas and various departments in the sciences.

*Opportunities for renewal and emerging science*
The department is clearly open to new research directions. We would particularly note the cross-disciplinary Science, Technology and Society program, re-
cently relocated from Information Technology to the Department of Economic History. The STS’s openness to addressing contemporary and policy issues is particularly welcome because it has the potential to bring the humanities into a wider ambit, where they tend to be absent. The KultEko initiative, established in 2009, brings together a large number of other institutions to study a range of questions to do with arts, aesthetics, consumption and the economy. The panel thought these were all excellent initiatives, but that the department, strong as it is, could afford to embark on some slightly more risky projects, perhaps to do with the environment, globalization, or non-European, non-Western historiography.

**Actions for successful development**

It is possible that, if the department was slightly more global in its orientation and marketing, it would attract more undergraduates as well as a more geographically diverse crop of doctoral students. If there were more undergraduates coming into the department it would be possible to sustain a somewhat larger and more permanent staff, as well as to better integrate economic history into the education of undergraduates in adjacent disciplines.

**Effects of the KoF07-evaluation**

The department found the KoF07 process valuable because it encouraged them to take stock of their achievements. The two major results of the KoF07 evaluation were: a) the formation of the Uppsala Centre for Business History; and b) the establishment of a new tenure-track position. Both of these developments enrich the research atmosphere of the department in addition to being the springboard for new collaborations. In particular, the new tenure-track position has facilitated the establishing of the collaboration on Culture and Economy (KultEco).

**Other issues**

The department is notable for its engagement with issues to do with the larger society. This ranges from collaborations with business enterprises around historical questions to members of the STS program engaging with the world of scientists.
**Panel 10**

**Scope of the panel's evaluation:**
Department of Law

**Department of Law**

**Introduction**
The panel has received and reviewed the report from the Faculty describing ongoing research and opportunities for renewal and innovation (part A), a form (part B) with quantitative quality indicators has been filled out by the department, and the account for personnel, funding, research examination, publication, etc. has been extracted from the university databases (part C). In addition we have conducted interviews with the dean and vice dean for research and with representatives from the different fields of research at the Faculty. We have also interviewed representatives from the Uppsala Forum on Peace, Democracy and Justice, the Centre for Police Research and the multidisciplinary program: “The Impact of Religion: Challenges on Society, Law and Democracy”. Furthermore, we had an interview with the doctoral students at the faculty.

We have thus based our assessment on what the Faculty has chosen to present to us in writing and orally and have had limited possibilities to conduct our own separate investigations into the research of the Faculty.

The interviews were conducted during our site visit Tuesday May 10–Thursday May 12. We met with representatives from the research fields separately. In all interviews the researchers were asked to comment within their field in relation to the following four points:

- research strategy of the faculty,
- the positioning of their field in relation to the research going on in the field at other universities in Sweden,
- their international contacts and networking,
- their publication strategy.

In addition we discussed issues more specifically related to the different fields of research.

Like the panel of KoF07, this panel wishes to point to a particular problem related to the incoherent introduction to the various fields of law within the Faculty. This is most significant in regard to private law. Despite the fact that a large proportion of the research at the Faculty is carried out in private law, which covers a broad variety of disciplines, not much time was devoted during the interview to the presentation of the many different fields. By this, the various disciplines of private law were not able to present themselves properly. The panel therefore feels that it has been left with a somewhat insufficient knowl-
edge of the ongoing research in most private law areas. If relying only on the interview and the written material handed out, we therefore find it difficult to evaluate the private law research and its many research directions.

It is our impression that the Faculty as a whole is undergoing a positive trend with a vitalisation and renewal of many research activities. This is partly related to the expansion that the Faculty is undergoing related to the increase in the number of students admitted. The Faculty is dominated by relatively young researchers contributing to a dynamic atmosphere, and in many fields there is an interest in combining field specific inquiries with more general theoretical issues. Good examples of this are to be found within fields of civil law such as general contract law, tort law, and family law, and criminal law.

Research is conducted over a large number of topics encompassing all traditional fields of legal research. The research at the Faculty of Law in Uppsala mirrors the social changes of the last decades where both European issues and the effects of globalisation are central. The research is currently in an expansive and creative phase, which is mirrored in the research topics of many of the doctoral students at the faculty. Over the last few years new researchers have been recruited and more areas of research have been developed and strengthened.

**General assessment of the department**
The legal research at the Faculty of Law in Uppsala is conducted within different areas of law, rather than departments or programs. Research is undertaken in the fields of jurisprudence, constitutional law, administrative law, environmental law, tax law, criminal law, procedural law, legal history, public international law, private international law, European law and many different fields of private law.

The research management at the Faculty can be described as decentralised in the sense that the choice of research areas and topics and whether the research should be done individually or in groups is are left to the researchers. This is the result of a deliberate strategy based on a firm belief in the advantages of a bottom-up approach to research. Apart from ensuring that there are qualified teachers in every subject taught in the law curriculum the Faculty’s more targeted directing of research activities has been limited.

The panel recognises the importance of academic freedom and the need for research topics and problems to be formulated bottom up, especially in the field of law, with its emphasis on the importance of providing legal arguments for any interested party. We therefore have sympathy with the approach taken by the Faculty in developing its research strategy bottom up.

Like the panel of KoF07 we nevertheless think that the Faculty could benefit from an explicit discussion about its general research policies, stating the priorities and development areas in future research. The bottom-up approach seems to have lead to a lack of a necessary overview over the activities going on. A more comprehensive approach to the research activities could facilitate a more active role for the Faculty in bringing researchers together and giving
necessary stimulants and incentives independent of the need being recognized by the individual researchers.

The apparent lack of a strategy may not affect the quality of the research at the Faculty directly, but for instance, the fact that there is little or no substantial research within fields such as competition law and social insurance law does not seem to be the result of a conscious decision. A strategy could also help making the gender perspective more visible. It could also help the Faculty to decide on what resources would be needed to develop the legal side of the Centre for Police in a sustainable manner and to develop such fields like law and economics and sociology of law.

Apart from aiming at fulfilling the teaching obligations, there seems to be no long term plan on how to recruit new researchers. The long term planning is especially important when senior scholars are up for retirement, where there is a need for a clear vision on how to maintain and further develop the competence and networks that have been established.

The panel of KoF07 emphasised the lack of joint research projects. As noted by that panel, joint efforts by researchers may increase the prospects Faculty to succeed in the competition for research grants both at national and EU level. With some exceptions, we have made the same observation and think that more joint projects should be stimulated by the Faculty. We think much of the research at the Faculty could benefit from such stimulation and from encouraging and aiding researchers in seeking together in applying for external funds. Some of the areas where the Faculty has promoted research seem a little half-hearted from this perspective. A notable example is the field of medical law where a research field of a very high standard could have been achieved had the Faculty allocated more resources and brought together researchers from other fields such as administrative law and torts law. Another example is the Centre for Police research. There is certainly a potential here, but it would be in need for greater resources and support to develop from an ambition to a research centre.

We appreciated that the researchers in general recognised their obligation towards the Swedish legal community and towards the Swedish society. It is also valuable that the traditional Nordic co-operation within the different fields of law is maintained. Many had also established European and broader international contacts and networks. We have, however, noted the lack of overall strategies for internationalisation and publication. There should be a more explicit policy which encourages doctoral students to study abroad and establish international contacts. It is also our impression that the question of where to publish and how to reach out in international publication channels is left to the individual researchers. We believe that all could benefit from support from the Faculty in such matters.

Quality of research
The primary goal of the evaluation is to identify strong areas of research and successful research constellations. It also aims at finding emerging science and
potential for renewal. We have therefore chosen not to give a comprehensive review of all fields of research, but have focussed our report on what we consider the strongest areas of research and research constellations, and/or areas with a special potential or need for improvement. In this we have tried to probe the standing of Uppsala University research activities in an international perspective. The evaluation is not aimed at highlighting individual scientists but rather assess performance and prospects of research groups, and the department as a whole.

There is active and innovative research in family law and related fields and, notably, in the private international law aspects. Research activities in these areas take up important challenges raised by globalization, new family practices or new value judgments. The activities have a national and a comparative as well as an international outlook and make extensive use of international networks at all levels, Nordic, European, and global. The research undertaken also provides a platform for further studies of the possible impact of Muslim law in Swedish law. The faculty’s participation in the cross-disciplinary programme “The impact of Religion” is particularly linked to researchers in family and succession law but includes researchers from other fields and appears very promising. The research work in areas connected with family law, particularly its transfrontier aspects, certainly attains an internationally high standard and the faculty confirms its high reputation among Nordic law faculties as regards private international law in general.

The panel also notes that there is a dynamic research group in the area of tax law consisting of several senior and junior researchers. The group works in a multidisciplinary manner both inside Law Faculty (with company law) and outside in co-operation with departments of economics, business administration, and social sciences. There is a specific publication strategy to publish besides Swedish also increasingly in European and international series. One of the interesting themes of the group focuses on the tax base in globalized economic circumstances. The panel sees as a positive sign of the potential of the tax law research group that it has already got external financing for one of its key areas. Due to the fact that the research primarily is directed towards the Swedish and Nordic communities, it is difficult to characterize this group as being leading level with great international impact, but the research certainly seems to be of a high quality.

The Faculty has for many years had a strong position in environmental law among Nordic universities. The research is to a great extent characterized by including the natural sciences and ecological perspectives and undertaken with a particular view to legal policy and actual effects in the environment. The panel observes, however, that a large part of the resources are used to give courses in environmental law at other institutions or as part of continuing education, or to respond to public hearings of proposals relevant to environmental law. Surely this may provide an input to research as well as an influence on lawmaking, but the panel nevertheless has the impression that these activities are so time-
consuming that they leave too little time for in-depth research.

There are also other fields where there are research environments of a high quality, certainly of the best in a national context, like, e.g., the fields of administrative law, criminal law, constitutional law, labour law, and presumably certain areas of private law.

**Research environment and infrastructure**

Due to the expansion that the Faculty is undertaking, a large number of the staff is junior researchers with heavy teaching obligations. The Faculty seldom recruits new personnel to traditional chairs, but instead announces positions as “lektor”. The main channel for new staff goes through recruitment of doctoral students. This has the benefit that it is possible to recruit the number of persons needed to fill the increasing teaching obligations. On the other side, it is difficult, although not impossible, to recruit persons who are already established as researchers within their own field, especially in an international context.

The main focus of the Faculty seems to lie on teaching, with rather heavy obligations on the personnel, and no possibilities for regular sabbaticals. The Faculty has attempted to remedy this by reducing the teaching obligations for “lektors” and professors, but is still hampered by more general Swedish norms and by the fact that the research part of the Faculty’s budget is decreasing in relative terms. Unless the Faculty can obtain external funding of its research activities or convince the university to bring a better balance between allocations for teaching and research, we fear that it can be difficult for the Faculty to maintain the necessary standard of research in the future.

In the Uppsala Forum for Peace, Democracy and Justice the faculty has a link between activities going on in legal fields and in other disciplines, which is considered important both for encouraging cross-disciplinary activities and for internationalization of research.

Publication is an important part of research activities, and essential for the undertaking of the obligations that researchers have towards the larger community of researchers, and also for building networks and establishing a reputation for the research that is undertaken. In this light we would have expected to find a more comprehensive view on publication policy within the Faculty and the different fields of research.

Traditionally, monographs and handbooks are important channels for disseminating legal research, which when addressing the national audience usually must be written in the national language. But with the internationalization of law and legal research and the increasing importance of theoretical reflection also within basic legal research, other channels increase in importance. Legal scholars need to increase their consciousness in regards to where they chose to publish the results of their work, and to increase their competence in order to get published in recognized international publications when appropriate. We believe that support and encouragement from the Faculty would greatly benefit
many of the researchers in this respect, and would recommend the Faculty to establish a policy to accommodate this.

**Networks and collaborations**
The panel observes that in the Faculty report as well as in the discussions with the research environments very varying co-operation modes has been called networks. In many instances individual contacts to foreign colleagues were mentioned as a kind of cell in a personal (individual) network. These personal contacts are valuable, but they cannot cover the need to establish more elaborated networks of researchers from a larger number of institutions contributing to the answering of research questions of a more general interest.

The panel values the strong overall commitment and active role of Uppsala researchers to uphold and continue the Nordic networks in different fields of legal research. Researchers, over a large number of fields seemed committed to maintaining these networks.

There were also international co-operations which showed an active and very constructive role in international networks proper. Notable examples of this are research in the field of private international law and labour law. Perhaps there would be room to strengthen the role Uppsala researchers have in similar networks in order to become the key partner in other networks of this kind.

Another type of collaboration and networks is research in co-operation across the boundaries of specialisation. Many of the researchers at the Faculty collaborate with colleagues from other research fields. It seems that the Faculty is organized in a way that encourages such co-operation. In many fields there is also interdisciplinary collaboration with researchers from the social sciences, humanities and natural sciences. Such collaboration across different fields is greatly beneficial for the possibility to attract research funds.

**Opportunities of renewal and emerging science**
The research at the Faculty has many interesting opportunities of renewal of legal scholarship in both a national and international context. There are many exciting emerging new topics in the research pursued, especially, but not limited to topics of doctoral students, like Islamic family law, law of educational institutions, and topics reflecting the emerging differentiation of values, cultures and regulation regimes in society.

There are also research groups that have the potential of new legal innovations and of achieving standards of excellence. We would in this respect specifically mention the research connected with the Impact project, the European law research and the field of criminal law.

**Effects of the KoF07-evaluation**
In general, the recommendations of the KoF07 have been followed up by the Faculty. The administration has been strengthened, more international and interdisciplinary research and co-operation has been established, and a substantial
theoretical component has been introduced in the Faculty’s doctoral training and resources have been allocated to the specific fields targeted by the KoF07 panel.

Since the KoF07 the Faculty has made efforts for improving research by reducing teaching obligations and by other specific measures. A special research environment has been developed for European law with a focus on primarily EU law. The goal is for this to be a national leading research environment with extensive international research collaboration. Several other strong research environments have developed. The Uppsala Center for Labour Studies (UCLS), established in 2010, provides a platform for interdisciplinary research between economics, political science and labour law. This seems promising with a good chance for development of the faculty’s labour law research. However the panel did not receive any information about this new initiative during our round. Two areas – one on the borderline of international law and criminal law and one in international company taxation and corporate law – have received special support through the establishment of program professorships. In criminal law, research has also been encouraged by funding of a postdoctor position and by special benefits to one of the professors. We found that such measures were greatly appreciated by the researchers, and have contributed to the vitalisation of research within the Faculty.

As mentioned above, there is still a need to develop a comprehensive research strategy at the Faculty level, and to encourage and facilitate young researchers to travel abroad and spend time at institutions outside of Sweden. We have also noted above that the recommendation regarding maintaining the number of chairs has not been regarded by the Faculty. We agree that the lack of international, or at least Nordic announcement of vacant positions, may have disadvantages. An alternative to recruiting internationally to regular positions is to establish an approach to attract internationally reputed scholars on a part-time basis.

Other issues
We had a separate meeting with the doctoral students at the Faculty and were given the impression that the Faculty provides a good environment for young researchers. Looking at the statistics, however, we observe that the average time for completion of the doctoral thesis is high. These numbers may not accurately reflect the average time for full time doctoral students. We have noted that the Faculty has taken measures to help its doctoral students to complete their projects in time, but we nevertheless recommend that the Faculty continues to pay attention to this matter.
Scope of the panel's evaluation: Department of Theology

Department of Theology

General assessment of the department
The Department of Theology belongs to the Faculty of Theology in Uppsala, which is a well-functioning, modern faculty. The faculty offers programmes in both classical theological and religious studies. It is shaped by these two research traditions, which provide a strong academic environment for the study of religion, both historical and contemporary. In a situation where religion in the Western world and elsewhere has become more public than for many decades, the panel regards the faculty as an important part of Uppsala University.

The panel regards the Department of Theology as an institution where good, significant and in some cases excellent research is done. Some of the units hold a high international standard, standing out as the strongest parts and with decisive international resonance in the best academic contexts. The interfaculty programme entitled The Impact of Religion received a ten-year grant from the Swedish Research Council in 2008 and has already developed into a centre which attracts top-quality international researchers. The department as a whole has improved considerably since KoF07. No units have deteriorated, and the units which were weak last time have improved remarkably. The Faculty management has obviously used the KoF07 in a very fruitful manner. The decisions taken to meet the demands in the KoF07 report have been successful and have thereby contributed to lifting the faculty’s overall quality to a higher level.

The plans to focus more on research and education in Islamic theology are promising and interesting. The panel has observed a growing research interest in this topic among the younger generation of scholars in most of the disciplines. The Faculty management also wants to give priority to this field by opening a new position for a professor and lecturer. In a situation where the demand for higher academic competence is needed in Sweden, other Nordic countries and Europe as a whole, the panel finds this initiative promising. Building on both bottom-up and top-down initiatives and in a context of increased collaboration with other institutions in the Nordic countries, the panel strongly recommends this initiative. The importance of such an initiative is also strengthened by the increased focus on Islamic issues – especially on law-related research – in the Impact programme. The panel recommends initiatives, which might give the Faculty a leading role in the field of Islamic theology in the Nordic countries.

In the coming years there will be a significant generation shift. Almost half
of the chairholders will retire, and the faculty has developed a good plan to prepare for this. In this situation, the panel recommends that the Faculty give priority to promising young scholars in order to stimulate an interesting renewal of its staff and profile.

Quality of research

Biblical Studies: Old Testament Exegesis and New Testament Exegesis. – The two Biblical disciplines show significant developments in their research profiles since KoF07. They have both moved from a somewhat unclear situation (KoF07) and are now reaching for a position of high international quality. This change has to a large extent been accomplished by the strategic recruitment of staff, which seems to promise a future increase in the disciplines’ research capacity. The panel recognizes several signs of good opportunities for biblical studies in Uppsala in the future.

The scholars of Old Testament Exegesis have been successful in attracting external funding, which is a mark of high quality. Together, the teachers cover the classical fields within their discipline: text-oriented work, including linguistically oriented studies, historically and archaeologically oriented studies, and reception-oriented work, with an emphasis on the reception of biblical texts. Several points of contact exist here with current research inside the Faculty, particularly with regard to reception history. The Old Testament scholars publish in internationally recognized forums and are also in other respects active in the international academic arena. The doctoral students, who are relatively modest in number, seem to be well educated due to designed collaboration with other seminars within the university as well as other research communities.

The New Testament scholars have published in many internationally recognized periodicals and monograph series. They are very competent in the classical fields of their discipline, such as the gospels and the epistles, and are involved in promising research projects in Qumran Studies, Apostolic Fathers, and the reception history of the Bible. The discipline is characterized by its multi-methodical approach, and the researchers are actively involved in networks in the Nordic countries, other parts of Europe and North America. The New Testament staff has a very clear profile in international collaboration, and their impact on the current scholarly discussion on several topics is significant. The increasing numbers of doctoral students are offered a good education in several seminars inside and outside the department.

Church History, World Christianity/Interreligious Studies, Ecclesiology. – The panel appreciates the changes which Church History has made since KoF07. The research is thematically related to the Nordic region in the 18th and 19th centuries and is predominantly conducted by doctoral students. The discipline has six doctoral students, who regularly meet in the research seminar of the discipline. The work is written mainly in Swedish, which is understandable given the focus on Swedish church history, but this presents an obstacle to interna-
tional reception of the research. Regarding the research programme The Impact of Religion, the panel regrets that no church historians are involved, although there is a historical perspective in the programme. However, the external funded project on the Anglo-Saxon revival movement in relation to modernity offers possibilities for collaboration with the project Lutheran Theology and Ethics in a Post-Christian Society. Close cooperation with Ecclesiology already exists within the faculty. According to the panel this offers the chance to adjust the Faculty structure in a more efficient way in order to stimulate synergy effects.

World Christianity and Interreligious Studies has made remarkable progress since a new professor took over the chair. Three doctoral dissertations have been defended and three new doctoral candidates have been accepted. The research area of Christian Islamophobia in Europe is very promising, but might be conducted in cooperation with a similar project in History of Religions. Likewise, other research areas in World Christianity could benefit from collaboration with Ecclesiology and Church History as well as with the research programme The Impact of Religion. The members of the discipline are well represented in international networks and publish regularly in international forums.

Ecclesiology as an independent unit, separated from Systematic Theology (especially Dogmatics), Church History or Practical Theology, is peculiar in the field of theology. Formed in 1995, it understands itself as covering areas of classical dogmatics, practical theology and church history. Since KoF07 the discipline has developed its identity in the crossover area between Systematic Theology and Church History as well as in cooperation with Practical Theology in Lund. The discipline steadily produces a good number of doctoral theses. However, its identity as ecclesiology separated from its natural partner disciplines seems problematic. The panel therefore suggests close and regular cooperation with Systematic Theology, Church History and World Christianity. Individuals are involved in various international networks and symposiums, and a considerable amount of titles is published in international anthologies and periodicals.

Systematic Theology and Studies in World Views, Ethics, and Philosophy of Religion. – In KoF07, the quality of research in these areas was rated as being of high international standard. Between 2007 and 2010 the research has continued along the same lines. While the majority of the publications in Philosophy of Religion is conducted in English and holds a high international standard, the works in other disciplines are mostly in Swedish. The Swedish-language publication lessens the international interest in research which in itself may be of a high quality.

Systematic Theology and Studies in World Views sees itself as a continuation of the paradigm laid out by Anders Jeffner and simultaneously reflects a paradigm shift from modern to post-modern and post-colonial readings of culture and society. The unit has participated in the programme The Impact of Religion and has also cooperated with Ethics and Philosophy of Religion. Research is predominantly shaped around Swedish society and culture. It is concentrated
on contemporary faiths and world views as well as the methodological questions associated with this research. The scholars of Systematic Theology conduct national and some international collaboration. The unit has ten active doctoral students now, and eight doctoral students have successfully completed their projects since 2008.

The research in Ethics is concentrated on theoretical issues of ethical theories and the nature of Christian ethics as well as on questions of human rights, distributive justice, ethics and literature and topics of applied ethics. Various projects form a multi-faceted professional research programme, and the discipline has been successful in finding external research funding. Researchers of Ethics co-operate with scholars of Systematic Theology and Philosophy of Religion, particularly in the project Lutheran Theology and Ethics in Post-Christian Society, which analyses the content of ethically relevant conceptions in Lutheran theology and evaluates their possible relevance in multicultural societies. However, the panel suggests that the project ‘Lutheran Theology and Ethics in Post-Christian Society’ should be done in closer cooperation with the ongoing Luther-research in the USA, Finland and Germany. Ethics is also represented in the Uppsala Centre for Russian and Eurasian Studies. Ethicists are active in many Swedish and international research networks. Promising research orientations include reconsidering the foundations of Lutheran ethics, Orthodox ethics, and Christian social ethics in the context of political philosophy and ethics and literature. There is a good doctoral programme. Six theses were published between 2007 and 2010 and six doctoral projects are ongoing.

Philosophy of Religion has a longer tradition of research into the issues of realism in religion from the point of view of pragmatist philosophy. This has provided the discipline with much international visibility. The same can be said of the other main research direction, which concerns questions associated with religious belief and scientific rationality. The philosophers of religion have produced many international publications, and the discipline has hosted major international conferences. It has an extensive local and international network of research cooperation. It is also active in the project Lutheran Theology and Ethics in Post-Christian Society and in section six of The Impact of Religion programme. Three doctoral dissertations were completed between 2007 and 2010 and there are four ongoing doctoral projects. Among the promising new research directions is the study of so-called New Atheism.

History of Religions. – In KoF07, the History of Religions section was recommended to strengthen its international cooperation. It was also suggested that the discipline should concentrate on fewer research fields. Moreover, the KoF07 panel supported the idea of specialising on themes rather than on religions as well as on plans for strengthening Islamic studies. In the new interviews (2011), the representatives of the discipline exemplified the strengthening of international collaboration, presented five main research themes and referred to a process of hiring a lecturer in Islamic studies. In order to improve the training of
doctoral candidates, who work in very diverse fields, the discipline has increased the number of assistant supervisors from other universities. On the whole, History of Religions has a strong international orientation and is well represented in the interdisciplinary Impact programme. The historians of religion regularly publish in international journals and, to some degree, cooperate with international publishers. Even though there is a considerable amount of cooperation with scholars within as well as outside Uppsala University, the present panel still recommends a concentration on fewer foci of research in order to raise the quality of the work of doctoral candidates, postdoc researchers and teachers. Furthermore, there is a need to improve efforts in the competition for external funding.

Psychology and Sociology of Religion. – The scholars in these disciplines have close cooperation with each other. Since KoF07, Psychology and Sociology of Religion have maintained their high international standard and increased their international collaboration and publishing. Some of the scholars and institutions they cooperate with are of top international standard. Most of the five central research themes in Psychology of Religion concern various aspects of health and illness. The panel sees a good potential for developing this strongly interdisciplinary field. However, an organisational strengthening of the efforts is recommended, be it in the form of a Centre for Spirituality and Health, as suggested, or otherwise. The discipline should make further efforts to increase the amount of external funding. By hiring more assistant supervisors from outside Uppsala, its representatives have responded to one of the recommendations of KoF07. The number of doctoral candidates is fairly small, and the ‘production’ of doctors has been quite limited. Hence there is need for improving conditions for the doctoral students.

Uppsala sociologists of religion stand out as exceptionally successful in terms of competing for external funding, which is an important mark of quality. In addition to the huge, interdisciplinary Impact Programme (2008–2018), initiated by sociologists of religion, the large-scale research programmes Welfare and Values in Europe (an EU programme with 35 researchers from 12 European countries, 2006–2009) and The Role of Religion in the Public Sphere (a Norel programme with scholars from all five Nordic countries, 2009–2013) have also been started by sociologists of religion. Given the great amount of funds available, it is paradoxical that the number of doctoral candidates is few. The ‘critical mass’ is increased partly because of laudable cooperation in a research school in cooperation with University of Agder in Norway as well as through other forms of cooperation. However, the panel recommends a certain redistribution of funds in order to increase the number of doctoral candidates and give them more resources, for instance in the form of courses in method and theory.

Research environment and infrastructure
The Department of Theology may be characterized as ‘top-heavy’ in that there
are many professors. Each of the 11 small research education disciplines (‘forskutbildningsämnen’) is headed by a professor, and some of them have only one professor and one senior lecturer permanently employed. In addition, there are 10 (postdoc) researchers, 32 doctoral candidates (excluding some financed by scholarships) and 12 ‘other staff’. There is a strong preponderance of men among the professors, whereas more than two thirds of the senior lecturers are women. The gender balance among the doctoral students is 50–50. The average age of the professors is high (60), and about half of them – all male – will retire within the next few years. This will provide opportunities for changing the gender balance as well as facilitating the implementation of certain reforms in order to further improve the quality of research and the training of doctoral candidates. The administrative facilities seem sufficiently available. All the different disciplines are housed in the same building. This facilitates cooperation within the department. In addition, departments with which scholars from the Department of Theology primarily collaborate are found mainly in the local area. Visiting scholars are provided with an office, access to a computer and other necessary facilities.

Opportunities for renewal and emerging science
Clustering and interdisciplinarity. – The panel sees interesting potential for renewal within the department. Based on the strong competencies in the 11 disciplines, the potential for stronger interdisciplinary research initiatives are obviously present. Both contemporary and historical research today requires more interdisciplinarity in order to make a stronger impact at international level. In many international calls for research proposals the demand for interdisciplinarity is explicit. The panel recommends that the Faculty management and the department encourage and stimulate interdisciplinarity by way of incentives and other relevant means.

In the quality assessment of the disciplines (above) we have intentionally presented the disciplines in groups. Many of these groups make up the same clustering as the one chosen for the educational areas of the department’s faculties. From the interviews and the written material available, the panel has noticed that an increase in interdisciplinary initiatives could lead to both renewed and new, promising research initiatives. The researchers themselves have to be active in establishing stronger interdisciplinary initiatives. All the same, the panel recommends that the Faculty and department management also engage in this issue. Facilitating research initiatives in this manner is a management task.

The panel is convinced that many disciplines would gain from stronger cooperation, both from a research perspective and from the perspective of doctoral education. One should also consider supporting and encouraging a development towards establishing informal and formal research groups. The individual research in the disciplines in general holds a very high quality, but there is clearly potential to increase research in the context of groups from different disciplines.
KoF07 recommended rethinking the number of disciplines and proposed a reduction in and closer cooperation between disciplines. This led to discussions among scholarly members and Faculty board members, resulting in the decision to decline the KoF07 recommendation on this issue. The explicit reason for this was that the Faculty found its strength was better maintained with eleven disciplines rather than with a reduced number. The panel, however, still thinks there is potential for renewal and for improving quality at the Faculty level. We therefore recommend initiating a process of closer cooperation between clusters of disciplines. With regard to clustering, our evaluation of the quality of research (above) points to untapped potential in many disciplines. Even if the eleven disciplines remain autonomous, closer cooperation both on a research level and on the level of doctoral education is to be recommended. We see a potential for clustering among the following disciplines:

- Old Testament Exegesis/New Testament Exegesis
- Sociology of Religion/Psychology of Religion
- Church History/Ecclesiology/World Christianity
- Systematic Theology/Ethics/Philosophy of Religion

Each discipline in Uppsala has developed its own seminar, which then often serves as the context for education of doctoral candidates. The panel registers that there seems to be overlapping thematic activity with regard to theoretical and methodical issues among the disciplines where we recommend clustering. The overlapping thematic is obviously also related to the research material. Last but not least, the overlapping is related to international traditions. The development of Systematic Theology and World Views, Ethics, and Philosophy of Religion as three distinct different disciplines does not fit in with the international discipline Systematic Theology. Internationally this discipline contains all the above-mentioned areas. We think these three Uppsala disciplines would benefit from stronger formal cooperation, both from a research perspective and from the perspective of doctoral education.

The same goes for the cluster of Church History, Ecclesiology, and World Christianity. The panel has discussed whether we should recommend Ecclesiology as part of the Systematic Theology clustering. Internationally, ecclesiology most often is part of dogmatics. This is probably not the case in Uppsala. It seems therefore more fruitful if Ecclesiology were to cooperate with Church History. The discipline World Christianity and Interreligious Studies has a very wide scope. Coming out of the discipline of Mission Studies, this broad scope is understandable. But the expansion into Interreligious Studies makes the scope even broader. The panel suggests closer collaboration between the historical disciplines as a good start for clustering. In the future, the specific field of Interreligious Studies should then consider whether it would gain more from being clustered with Systematic Theology.

The only discipline which we do not recommend be clustered is History of Religions. This is a broad area in itself. The panel has however noticed the inter-
est for developing a stronger emphasis in the studies of Islamic theology. This is mentioned in the self-evaluation presented to the KoF11 panel, and it has been further elaborated in a handout submitted to the panel during the evaluation week.

**Specific recommendations.** – We recommend the following initiatives, in a list of priority:

1. The initiatives regarding building up Islamic theology in the Faculty are promising. In a situation where the demand for higher academic competence in Islamic theology is needed in Sweden, other Nordic countries and Europe as a whole, the panel finds the initiative regarding Islamic theology in the Faculty promising. Building on both bottom-up and top-down initiatives and in a context of increased collaboration with other institutions in the Nordic countries, the panel strongly recommends this initiative. The importance of such an initiative is also strengthened by the increased focus on Islamic issues – especially on law-related research – in the Impact programme. The panel recommends initiatives, which might give the faculty a leading role in the field of Islamic theology in the Nordic countries.

2. The panel believes that research on the Apostolic Fathers has potential to gather researchers from several areas, including Old Testament Exegesis and New Testament Exegesis, History of Religions, Patristic, Church History, and Ecclesiology. This research area is listed in the self-assessment under “Current, particularly successful research areas”. The department has recruited a professor who specialises in this area. Furthermore, the Swedish Bible Society is about to commission a new Swedish translation of the Apostolic Fathers, a project in which several researchers plan to be involved. In addition to this could be mentioned the already established collaboration with seminars in Classical Greek and Byzantine Studies at Uppsala University, and the collaborative work with classicists within the context of the “strategic alliance” between the universities of Ghent, Groningen, Göttingen and Uppsala, as well as within the existing Nordic Patristic networks.

3. The Faculty sees the study of new atheism and its criticism of religion as a promising new avenue of research. The panel finds this a reasonable suggestion, which is based on an interest in many disciplines units in the Faculty. In addition to the analysis of the content and social and cultural impacts of radical atheism, this programme could also include the study of naturalist explanation of religion in science and its significance for world view.

4. With the main exceptions of History of Religions and World Christianity, research at the Department of Theology is, theoretically as well as empirically, Western-based. The recent – and continuous – shift in terms of power relations between ‘the West and the Rest’ is thus only to a very limited extent reflected in this research. The stronghold of religion(s), including Christianity, is now outside the highly secularized Europe – the ‘exceptional continent’ (a term coined by Grace Davie). However, the panel’s
interviews showed that there is a markedly growing interest in postcolonial perspectives in most of the disciplines, particularly among younger scholars and doctoral students. Given this emerging interest, and the worldwide importance of such perspectives, we therefore recommend the funding of a theory-oriented postdoc position in the postcolonial study of religions – not attached to any of the traditional research education disciplines, but open to wider competition.

**Actions for successful development**

The research programme The Impact of Religion: Challenges for Society, Law and Democracy (Impact), which is supported by a Linnaeus grant from the Swedish Research Council, runs from 2008 to 2018 and is based at the Uppsala Religion and Society Centre (CRC). The CRC is organized under the Department of Theology. The Impact programme is an initiative between the Faculty of Law and the Faculty of Theology involving researchers from these faculties as well as other faculties. The panel underlines the strong significance which a centre at this level of excellence will have for the two faculties involved and for Uppsala University as a whole. The panel sees here the potential for a future top international development of research initiatives focusing on both normative and analytical challenges with the increasing influence and significance of religions in the Western world and elsewhere. One main challenge to achieving this goal is the focus of the programme. It has, for good reasons, given rise to very high expectations for top-quality research in the coming years. However, the panel recommends that the programme management strengthens the focus of the programme. We see an especially strong interest in the new normative issues to be dealt with when Islamic, Christian and Secular thinking are to cooperate within a context of an increasingly multi-religious society.

**Other issues**

As mentioned above, it is the opinion of the panel that the Faculty could increase both quality and renewal by encouraging stronger collaboration between disciplines and clusters of disciplines. This is also valid in the field of doctoral education. In the interviews, the doctoral students report that they find the organisation and activities for the doctoral candidates to be good and well-functioning. All disciplines have seminars where both faculty staff members and doctoral students regularly participate. The panel finds these discipline-oriented education practices for doctoral students positive and important. However, we also think that the Faculty should stimulate doctoral education for all candidates at Faculty level. Initiatives on domain or university level should also be considered. The reasons for this recommendation are both pragmatic and systematic.

During the interviews and in the general dialogue with researchers and doctoral students, the panel has witnessed many overlapping discussions regarding new theories, methods, and the relationship between theology, religious studies
and gender theory among the disciplines. From a systematic perspective the panel finds that courses for all doctoral students at Faculty level would increase the general quality of the doctoral education. The panel therefore suggests that the Faculty take the initiative to establish a ‘forskarskola’ at Faculty level. The allocation of resources from the university to such an initiative would be a strong encouragement to realise a qualitative improvement in the field of doctoral education.
Panel 12

Scope of the panel's evaluation:
Department of Mathematics
Department of Information Technology
Centre for Image Analysis

Introduction
The panel evaluated seven units, all three divisions of the Mathematics Department, three divisions from Information Technology, and CIM, a joint effort of these departments. In the following, each unit is considered separately with a few general recommendations collected at the end.

In science, four years is a relatively short time for dramatic improvements. The panel was therefore not surprised that many of the comments made by the panel of KoF07 were still valid as such. We shall not repeat them all. However, there was one notable change. Namely, the spirit in the Mathematics Department is now optimistic, and there is a willingness to open up the borders and reach out towards other sciences within the university. As Uppsala University is a comprehensive university with many faculties, there are many opportunities for cooperation in different areas. Thus there should be possibilities to build up larger and long lasting interdisciplinary projects which could get substantially more money from external sources than what we see today.

The panel noted that there was a rather general wish to work in relatively small units, which is a common feature in pure mathematics. Combined with the rather heavy teaching load of the Swedish system, this wish makes it difficult to get the necessary room for renewal. It is therefore all the more important that the new openness policy is recognized and supported by the university leaders.

Compared with the situation described in KoF07, the panel observed clear evidence of strategic thinking which was said to be lacking previously.

General recommendations and observations
A recurrent observation made by our panel during this evaluation week is that the administrative structure of the university appears unnecessarily complicated. This must almost certainly create complications in terms of the internal management and the decision making process, but it also projects a blurred and confusing image for the outsider who is in search of information.

Within the area of competence of this panel, a typical example is the existence, within the Domain of Science and Technology, of an administrative structure called Mathematics and Computer Science, which in turn contains two departments: Information Technology, and Mathematics. This appears rather inconsistent and may have negative consequences in terms of visibility. For ex-
ample, a person who looks for research activities at Uppsala University in communications, in signal processing, or in systems and control, can hardly guess that these IT activities are hidden under Mathematics and Computer Science, given that they do not belong to either of these disciplines and that Computer Science is a subset of Information Technology. The panel wonders whether the structure called “Mathematics and Computer Science” should be maintained, and whether the departments of Mathematics and of Information Technology should not appear directly under the Domain of Science and Technology, at the same level as Biology, Physics, Chemistry, Engineering, etc.

In the presentation made by the Vice-Rector for Science and Technology, we were told that the Faculty Board allocates the money directly to the approx. 70 research programmes, rather than to the 15 departments, and that the recruitments are based on hiring a person who will develop a particular research programme. We believe that this procedure is not conducive to the formulation of collaborative strategies at the department level.

The panel believes that the strategy for the creation of new positions should be elaborated at the department level with a view that the quality of the recruited person should take precedence over the particular research area; this approach would require that searches be sufficiently broad to ensure the availability of top quality candidates. The panel was pleased to see that the Department of Mathematics declared itself in favour of such an open recruitment policy. If the goal of a search is to move the department in a new direction, then care needs to be taken to understand how existing strengths of the department and the university can be exploited to make the position attractive to top quality candidates and how additional resources (e.g., lecturer positions) can be employed to ensure an environment in which the new faculty member is not isolated.

The panel was pleased to discover a new openness and desire for collaboration in several parts of the Department of Mathematics. The creation of the Centre for Interdisciplinary Mathematics contributes favourably to this spirit of collaboration.

The Department of Mathematics and the Department of Information Technology should consider developing a joint strategy for the recruitment of a high calibre person in optimization. This research topic, which appears totally absent in Uppsala unlike other Swedish universities, would clearly benefit a number of different groups, in particular the Systems and Control Division, the Division of Scientific Computing, and the Department of Mathematics. In order to attract a top person, it will be necessary to create a package. The position of that new person could be located either in Mathematics or in Information Technology. The best possible person should be selected, and the choice between these two locations should depend on the research activities of the person who is hired rather than being decided a priori.

There is a growing need for computational tools and methods in almost all sciences. Now is the right moment to invest in this development as both the interdisciplinary vehicle and computational skills are available. The university
should make a sufficiently long lasting plan about gradually increasing the monetary support and to give it enough visibility.

The panel was surprised by the small number of international PhD students. Student mobility is connected with visibility. An attractive image is important. The Mittag Leffler Institute could serve here as a vehicle for enhancing the international visibility of the strong graduate programs that exist in Uppsala and in Sweden more generally.

The heavy teaching load for young faculty without external funding is a well-known and chronic problem retarding the development of the best and the brightest (as well as discouraging potential applicants for lecturer positions).

Department of Mathematics

Analysis & Applied Mathematics

General assessment of the unit

The activities encompass a number of research topics ranging from abstract analysis to differential equations, dynamical systems, probability theory, mathematical finance and analysis of models coming from mathematical biology. The overall assessment of the researches performed in the division is that they reach generally an internationally high standard, with some top-quality (world leading) activities.

Mathematical analysis is a field of vital strategic importance in a first-rate Department of Mathematics. In addition to being a body of knowledge and a lively research subject in itself, it is the major area for developing the tools needed for the rigorous study of models coming from applied sciences. The analysis group is now small, relative to the size and the applicative ambitions of the department, and we feel that this is a point of weakness. A number of the research programs within the division are rather related with topics in probability, probabilistic combinatorics, and applications of stochastic calculus to mathematical finance. This is far from being viewed negatively, but it makes the boundary between this division and that of Mathematical Statistics (actually more focused on probability than on statistics) look artificial, and risks weakening the whole structure when strategic decisions have to be taken.

Quality of research

Janson is a world leading scientist highly recognized in different research fields and has major achievements in the field of random graphs.

The research lines in analytic number theory are also at the top of the international level, and the application to kinetic models reaches internationally high standard.
The group working on nonlinear differential equations and dynamical systems (methods and applications) also has an internationally high standard.

The group in mathematical finance not only runs a successful Masters program but also produces a steady stream of internationally recognized research which is likely to reach an internationally high standard as the program matures and develops.

Sumpter’s work is assessed at the top of the international level in mathematical biology and represents a great opportunity for further cultural openings in the direction of interdisciplinary mathematics.

**Research environment and infrastructure**

Compared with other divisions, the ratio between PhD–postdocs and professors is really low and needs to be improved, especially for the analysis area.

**Networks and collaborations**

Many researchers have a wide network of international collaborations. The mathematical biology program has been awarded an ERC Starting Grant.

**Opportunities for renewal and emerging sciences**

The research line on nonlinear PDE and Dynamical Systems has great potential, and very good perspectives can be foreseen both from the theoretical and the computer assisted side. Major challenges concern the elaboration of constructive (hence liable to be treated with computer assisted/computational methods) methods for the search for new invariant nontrivial structures in nonlinear systems. The presence of an extremely active group in mathematical biology also represents a big opportunity for renewal of the division and can be a starting point for new theoretical developments and possible collaborations.

**Actions for successful development**

The research lines in analytic number theory and probability should receive enough resources to be kept at the highest level as they are.

A reinforcement of the nonlinear differential equations research line was suggested in KoF07 and is still desirable. A further suggestion is to be open to other research topics in analysis which are not in the tradition of the department, such as the calculus of variations, the mathematical theory of control and optimization, mass transportation and geometric measure theories. This could serve as a bridge towards many interdisciplinary applications and notably with the research lines developed in the IT Department (e.g., in image segmentation).

Consider the possibility to hire an additional top-level leading mathematician in analysis.
Algebra, Geometry and Logic

General assessment of the unit
The group has nine permanent members of which five are professors. At the time being there are one postdoc and seven PhD students. The research covered by the algebra group is commutative algebra, algebraic geometry, division algebras and higher representation theory. In the last subject, there are included several topics which on a world basis are extremely active and represent the latest development of algebra. In geometry the activities are centered around symplectic geometry, differential geometry and singularities. Those parts of geometry are very active areas with a lot of excellent teams around the world, and the topics treated at Uppsala are all at the forefront on a world basis. The logic group is very small with one professor and one lecturer being active in the research.

Quality of research
From the point of view both of the research activity and the quality of the research done, the panel finds that the group is very inhomogeneous. The most active members, both in algebra and geometry, are performing on a world-class level, but the performance of the rest of the group varies from international high standard to acceptable.

Research environment and infrastructure
The ratio between PhD–postdocs and professors is low and needs to be improved.

Networks and collaborations
The two most active researchers have an extensive international cooperation, sometimes with some of the best mathematicians in the field, and they have wide networks. We especially mention the participation in the ESF programs CAST and INFTY where the group is present in the steering committees.

Opportunities for renewal and emerging sciences
The most active parts of the group are doing research of a high quality and, being young and dynamic, there is certainly a potential for further developments. There is also a potential for a further development of a fruitful cooperation between the algebraists and the geometers. The participants seem to go well together and they certainly have common interest in several topics.

Actions for successful development
The department should see to further development around the active parts and use future vacancies to strengthen those parts that are of internationally high level.
Mathematical Statistics

General assessment of the unit
Research in the Division of Mathematical Statistics is dominated by work in the area of stochastic processes and stochastic models, with four of the six permanent staff, including all three professors, working primarily in this area. The recent addition of Professor Konstantopoulos broadens the range of stochastic methods employed as well as the range of applications. Much of the work in the division is concerned with limit theorems, approximation of models, and the study of new forms of limiting models. Stochastic networks are a major research direction with motivation from problems arising in communication networks. Researchers in the division are involved in developing and assessing models of specific phenomena in a variety of scientific areas.

The age distribution in the division is not a cause for immediate concern, and the current recruitment for a lecturer in statistics and finance is likely to further broaden that distribution. Only one of the six permanent members is female.

Quality of research
Much of the research in the division is of an internationally high standard as evidenced by publication in high profile journals and collaborations with leading international researchers.

Research environment and infrastructure
The facilities occupied by the division are excellent and are located in convenient relationship to other departments that are likely sources for collaboration. The panel heard no concerns regarding computing facilities or library resources. The balance between senior and junior researchers, including PhD students, is reasonable.

Networks and collaborations
Members of the division have the expected range of collaborations within the university, across Sweden and internationally. The opportunities for future collaborations within the CIM are appreciated.

Opportunities for renewal and emerging sciences
The appointment of a new professor with interests in stochastic processes is a major step in the renewal of strength in that area. The planned appointment of a lecturer with interests in statistics and finance will strengthen connections among the faculty with interests in these areas.

Actions for successful development
As the modern field of statistics has evolved, it has, perhaps, bifurcated. On the one hand, statistical practice has become much more computational and less
dependent on probability-based models of inference. On the other hand, models to be assessed have become much more science-based, mathematically complex, and stochastic. Neither of these directions is well-represented in Uppsala, and the department should develop a strategy for addressing this shortcoming.

The primary strength of what is categorized as “mathematical statistics” in Sweden generally is in probability and stochastic processes, and the strength of the department in these areas suggests that focusing efforts for the development of statistical strength in such areas as inference for stochastic models may have the greatest promise for success. Exploiting possible connections with established programs such as the Centre for Image Analysis, the Centre for Interdisciplinary Mathematics (CIM), and the Division of Scientific Computing may also enhance the chances of attracting a highly talented core statistician.

The growing recognition of the importance of stochastic models in biology, related work already occurring in CIM and the Division of Scientific Computing, and the overall strength of biology at the university may make this area attractive for further development.

Effects of the KoF07-evaluation
The KoF07 report recommended that the next vacant chair be filled by a statistician. As noted above, the KoF11 panel shares the concerns of the earlier panel.

Other issues
It is misleading only to look at the Division of Mathematical Statistics in assessing the strength of probability and stochastic processes in Uppsala. If one considers work in probabilistic combinatorics and mathematical finance, categorized as part of the Division of Analysis and Applied Mathematics, as well as computational work on stochastic models in the Division of Scientific Computing along with the work in the Division of Mathematical Statistics, it is apparent that Uppsala is one of the leading centers of stochastics in Europe.

Centre for Interdisciplinary Mathematics, CIM

General assessment of the unit
CIM is a novel vehicle to carry out multidisciplinary research, both with other sciences and industry. An organisation of this kind was recommended by KoF07, though under a different name, and the panel was very happy to see that the university has taken here a successful, decisive action.

CIM is formally part of the Department of Mathematics but is in practice a joint effort with the Department of Information Technology, in particular with the Division of Scientific Computing.

Although the budget is only about SEK 4 million annually, a lot of cooperation has been created and the format seems to give on one hand continuity and
security for the people (as them being employed by departments) and on the other hand an almost informal focal point and platform for easy and successful interdisciplinary research.

It is too early to do a comprehensive evaluation at this point. However, to make a fair assessment one needs to first increase the funding to a level that achieves a steady state where each year a group of new PhDs can be hired. The panel has already positively noted that with the present leadership, interaction with CS and Uppsala University in general is growing, and with the start of the graduate school, a new type of researcher will be formed which will be very important for a modern and technology oriented society.

The quality of the research and ambition and enthusiasms of the people associated with the Centre are high and this type of approach not only removes barriers between mathematics and other sciences on problems where it is already well known that mathematical modelling and scientific computing is a necessity, but it also activates mathematicians to observe the intellectual challenges in new application areas.

Other issues
A graduate school has been initiated. The panel considered it important that the students which have their regular working places at their primary institutions, would have a “physical home place” to share experiences with each other. There is a great and long lasting added value in networking the PhD students from different fields together.

Department of Information Technology

[Other parts of the Department of Information Technology were evaluated by panel 18, see page 397 et seq.]

Division of Scientific Computing

General assessment of the unit
The Division of Scientific Computing (DSC) consists of two research programs, Numerical Analysis and Computational Science. The Scientific Computing (SC) program has a glorious past, being established in 1965 it produced many famous PhDs. There is a strong focus on numerical analysis for partial differential equations, which however extends today to applications in fluid dynamics, biology, quantum chemistry and many other fields. As it is also concerned with numerical software and computation on modern computer architectures, it covers the spectrum of what is today commonly called Computational Science and Engineering, CSE. There are four professors, ten senior faculty and four tenure track junior assistant professors. There is a very good age distribution.
The division is of core importance to Uppsala University as it helps increase the level of all research units within Uppsala University, which make use of computations and simulations. The division has already good contacts with many groups in Uppsala University which need research computing. The founding of the Centre for Interdisciplinary Mathematics helps to enhance these contacts. In addition, it is positively noted that the division is with two PI’s involved in UPMARC, the Uppsala Programming for Multicore Architectures Research Center. This 10 year Linnaeus project aims among other topics at developing algorithms and programming languages for multi core parallel computers.

Quality of research
The research in the division is of an internationally high standard. There are elements of top-level activities. The numerical analysis group is extremely good in using their high competence in more classical numerical analysis to solve problems in new subjects, e.g., multiphase flow in microfluidic devices, multiscale problems in systems biology, ab initio modelling in chemistry, and very high dimensional problems.

Research environment and infrastructure
The panel heard no complaints about the facilities.

Networks and collaborations
Members of the division are very well connected within Uppsala University due to extensive collaboration. These connections could be extended if SC had more researchers. There is a good range of connections, across Sweden and internationally.

Opportunities for renewal and emerging science
In the KoF07 three fields have been indicated for opportunities for renewal and emerging science. The present panel would like to add that more and more models have stochastic elements, e.g., in finance, biology. Numerical methods for such problems need to be developed. In addition high dimensional problems lead to very large linear systems. One sees in both fields that mathematics plays a crucial role.

Actions for successful development
The panel noted that a person in optimization is urgently needed. To create such a position is of great importance for all of Uppsala University as in many applications and fields one has to use optimization.

However in the near future there is no person expected to retire and therefore Uppsala University, the Faculty of Science and Technology together with the involved divisions must use their ingenuity to make such a hiring possible. The recommendation of KoF07 to continue to be deeply involved in real applications has been followed by the hiring of Axel Målqvist. This trend should be
continued. However to be able to develop new powerful tools one should also strengthen SC by hiring young researchers who are closer to mathematics. This would position SC to stretch from mathematics to the real-world applications and strengthen the link with the Mathematics Department.

This would give SC the possibility to team up with the CSE program with KTH, which started such a curriculum in 1997.

The CIM and the Division of SC need to be expanded as both are crucial for all sciences in Uppsala University which do computing and simulation.

Effects of the KoF07-evaluation
The KoF07 report noted that in the following fields there are opportunities for renewal: (i) Multiscale analysis, modelling and computation, (ii) High-dimensional problems, and (iii) Design optimization and inverse problems. The present panel saw that a young person was hired who works in high-dimensional problems and saw evidence that work is done in the area (i). However optimization is still missing.

Division of Systems and Control

General assessment of the unit
The main fields of activity of the Division of Systems and Control are in automatic control, system identification, and signal processing. In addition, the division has added a strong and growing activity in biomedical engineering, which is now supported by a prestigious ERC Advanced Grant. The development of this more recent activity is in line with one of the recommendations made in the KoF07 report.

Quality of research
The members of the division have shown their ability to adapt to changing challenges and to formulate new and challenging research topics. Most of their activities are of internationally high standard, with some being of top-quality; in particular, the division plays a world-leading role in system identification and in signal processing.

On the other hand, the members of the division appear to work and to define their research agenda in a rather autonomous way, without much interaction with other groups in the Department of Information Technology, the Department of Mathematics, or the Centre for Image Analysis, even though it appears to the panel that there is a potential for collaboration with these groups.

Research environment and infrastructure
The panel heard no complaints about the facilities.
Networks and collaborations
The members of the division have good connections within Sweden and internationally, but collaborations within Uppsala University appear somewhat limited.

Opportunities for renewal and emerging science
The division would greatly benefit from the hiring of an expert in optimization, as recommended below.

Actions for successful development
The age distribution in the division is rather unhealthy, with 3 of the 6 permanent staff being close to retirement. In the KoF07 report it was recommended that the retirement of Professor Torsten Söderström should be anticipated by the recruitment of a high profile researcher in systems and control. We understand that the position has been opened but that this recruitment attempt has not been successful. Instead, the division has opted for the recruitment of four junior staff.

The panel believes that the retirement of the senior members of the division, who to a large extent made its reputation, represents a potential threat and requires special attention. We were told that the department is fully determined to keep systems and control as a strong area in Uppsala, and that it aims to hire a strong leader in the systems and control area. Clearly, it will not be easy to replace world leading researchers like Peter Stoica and Söderström by people of the same calibre; one reason for this is that the division is relatively small and that there are world leading groups in systems and control in other Swedish universities that might appear more attractive given their larger size.

Thus the panel believes that the department should make a SWOT analysis, after which it should formulate a strategy for the future. Several scenarios can be envisaged. One possibility is to make a new attempt to recruit a top level person in systems and control. Another is to give the younger persons who have been hired recently sufficient support and freedom in their research topics so that they are able to emerge as leaders. Yet another possibility is to accept a change in the center of gravity of the research topics and to build a new area of strength in neighbouring areas, in collaboration with other divisions of the Department of Information Technology, the Department of Mathematics or the Centre for Image Analysis.

One possible scenario is to hire a strong person in optimization. Such competence is clearly missing for the moment at Uppsala University even though it has become central in many activities in systems and control in many other groups around the world. An advantage of a recruitment in optimization is that it would also benefit the Division of Scientific Computing and the Centre for Image Analysis.
Effects of the KoF07-evaluation

With regards to the recommendations of the KoF07 report, two of them have already been addressed above: the development of research in biomedical engineering, and the anticipation of the departure of Torsten Söderström. A third recommendation was to merge the Systems and Control Division with the Signals and Systems Division in the Department of Engineering Sciences. This merger has not occurred, essentially because the cultures and activities of these two groups are too far apart, we were told. Such merger could be considered as one of the possible scenarios mentioned above, but we recommend that it should not be enforced against the will of the people involved.

Centre for Image Analysis

General assessment of the unit

From 2007 until now, the size of the Centre for Image Analysis (Centrum för bildanalys, CBA) practically did not vary, and comprises 16 full-time doctoral students among 25.5 full-time scientists. The centre is now 22 years old, it still continues working on the same major domain, namely microscopic medical imagery, with the same main theoretical approach, based on discrete distances and geometry.

In January 2011, the centre, which was previously a research unit common to Uppsala University and SLU (Swedish University of Agricultural Sciences) was regrouped with the IT Department of Uppsala University.

Quality of research

The works of the CBA in the discrete approach applied to microscopic medical images, and of 3-D display is remarkable and clearly of internationally high standard. In the overall field of image analysis, the activities of CBA are internationally recognized. The development of techniques of visualization are among the best current output of CBA.

Research environment and infrastructure

The personnel composition has two major features. Firstly, the number of PhD students per professor, or lecturer, equal to 2, is higher than in most of the programs evaluated by Panel 12. Second, the gender balance at the CBA, 1/3 of females, turns out to be exceptionally good for Science and Technology. Computer facilities seem satisfactory. The major unknown variable concerns possible synergies with the other divisions of the IT Department, since the integration of CBA into the IT Department is only a few months old.

Networks and collaborations

Several professors of CBA occupy important positions in international associa-
tions, e.g., Borgefors is Editor in Chief of Pattern Recognition Letters, Nyström is secretary of IAPR (International Association for Pattern Recognition). In addition CBA participated actively in the creation of the International Association for Discrete Geometry for Computer Imagery.

The very existence of CBA relies on collaborations able to provide nice problems for image analysis. The main field of applications is medicine and industry of medical equipments. The centre has also a collaboration on a smaller scale with the forestry and paper industry.

Opportunities for renewal and emerging science
A major opportunity for CBA was of course the recent merging with the IT Department. But more generally, a closer cooperation with the Mathematics Department is desirable. Indeed, the set of theoretical notions that form the root of CBA is narrow, and the weakness of significant theoretical developments might penalise the future at CBA.

Another inter-disciplinary opportunity occurs, with the CIM, which also apprehends biology, but at larger scales than is done at CBA.

The key position in international societies/journals of some members provides an obvious advantage for being recognized at a high international standard.

Actions for successful development
The panel recommends that the CBA should intensify its relations with the divisions of mathematical statistics, scientific computing, and systems and control. The medical applications in microscopic imagery should be maintained, but not exclusively.

Concerning theory, CBA should invest more in the fields of optimisation by variational methods, and also by connective segmentation, and in the use of stochastic models of shapes and structures. The new trends in discrete geometry involve operators on simplicial complexes, a domain which should be studied.

Effects of the KoF07-evaluation
In KoF07 it was recommended to still focus on medical applications and on image visualisation, which has been done. KoF07 recommended in addition to develop the field of remote sensing, an advice which was not followed. The panel believes that this is a missed opportunity but that it is not too late to start an activity in this area.
Scope of the panel’s evaluation:
Department of Physics and Astronomy

Department of Physics and Astronomy

Overall comments concerning the department

General assessment of the department
As noted in the panel 13 report from KoF07, physics and astronomy have a long and distinguished history at Uppsala University, including two of the university’s eight Nobel Prize winners, and the most recent one, to Kai Siegbahn in 1981. This second review as part of KoF11 finds this tradition of excellence to be continuing, over a highly diverse set of forefront research areas encompassing fundamental theory; particle and nuclear physics; applied nuclear physics, astronomy and astrophysics; advanced spectroscopy and synchrotron radiation research in molecular and condensed matter physics; surface science, nanoscience and new materials development; theoretical modelling of materials; research in the teaching of physics; and several areas of energy-related research. Since 2007, and following a recommendation from the KoF07 report, the activities of the then five departments have been united in a single department with nine divisions, as indicated below:

![Diagram of department structure]

Figure 1. The morphological change that took place in combining the five departments of physics in 2007 into one department with nine divisions in 2011. Note that Ion Physics was added from Engineering into Applied Nuclear Physics.

The activities of the previously very large Physics Department (Fysikum) have thus been split into four divisions, and the Nuclear and Particle Department has been split into two divisions, with the Ion Physics effort having been brought in from the Department of Engineering as part of Applied Nuclear Physics. The panel is thus pleased with this change, although we caution that a maximum
of synergy and interaction should be encouraged among what is now a single department with a rather large number of divisions. For example, Molecular Physics & Condensed Matter Physics, Materials Physics, and Materials Theory constitute over 40% of the department’s activity by any measure (see Figure 2 below), and are very closely interrelated, and we urge some sort of special coordination between them to maximize synergy and impact for the future. We comment on the response to other KoF07 recommendations, as well as desirable future interactions and collaborations related to other divisions, in the division-specific evaluations below.

Figure 2 provides some indication of the relative sizes, productivity, and funding levels of these divisions, as to total number of staff (256 total over the department), number of graduate students (89 total), number of publications (556 total), and total revenue over all sources internal and external (total SEK 262.7 million). Roughly speaking, the fractional numbers here are consistent across these different measures, although the number of publications from Materials Theory, Astronomy and Space Physics, and High Energy are higher in
proportion to the other criteria, and those for Molecular and Condensed Matter and Nuclear somewhat smaller. However, we stress that these numbers do not directly measure quality, the primary goal of this review, but they provide some indication of where resources are within the Department of Physics and Astronomy, and roughly what the gross productivity levels are. Within the data provided to us as well, one can derive the ratio of faculty-funded research to externally-funded research, with the ratio $\frac{\text{[external support]}}{\text{[faculty support]}} = \text{Ext/Fac}$ as some measure of the return for Uppsala University investment being given in Figure 2(d). This ratio clearly varies widely over the nine divisions, with the faculty in some sense subsidizing research more in some divisions than in others. Positive ratios of note here are for Astronomy and Space, Molecular and Condensed Matter, Materials Physics, Materials Theory, and Applied Nuclear. Again, this ratio does not measure quality, but in a direct sense the ability to raise outside research support that leverages faculty support.

Across these nine divisions, we generally found much progress since KoF07, with evidence of increased productivity, external funding, and outside recognition; the development of new instrumentation and new facilities at Uppsala University and in multiple collaborations elsewhere; and two major new physics-related projects beginning construction in Sweden: the next-generation synchrotron radiation facility Max IV and the European Spallation Source ESS. Other activities in instrumentation and accelerator development are planned in connection with Uppsala University High-Energy and Nuclear projects (e.g., at CERN and at FAIR in Germany), as well as with the European X-ray Free-Electron Laser Project (XFEL).

Quality of research
Among these programs, we found several of top-quality, several of international high standard or international recognition, and some of acceptable (nationally significant) standard, but none that were insufficient. We comment on each division in this context below. As an overall ranking, the Department of Physics and Astronomy is of an internationally high standard.

Research environment and infrastructure
The research environment and infrastructure appear to be very good, with the centralization of all Physics activities in the Ångström Laboratory still being a continuing positive element, and the creation of the Centre for Accelerator and Instrumentation Development (CAI) being another positive development at the recommendation of the KoF07 report. We comment below on a proposal to enlarge the mission of the CAI significantly via a merger of it with the Ångström Mechanical Workshop (AMW), but first consider some other issues related to the funding of research, the nature of research positions, and the faculty makeup.
University vs. Research Support for positions—the tenure-track problem: The issue of how to give younger scientists a chance at what could be called true tenure-track positions that can also be competitively advertised in an international arena remains a problem that was discussed in KoF07. The basic issue is the evidently increasing degree to which a significant fraction of a younger scientist’s, or even a promoted Professor’s, basic salary has to come from external research funds. This leads to a situation in which the way forward for younger people who desire an academic career is not clear, and in which the university is also hindered in being able to recruit broadly and in an international context for new positions. There is also an uneven character of this support across the divisions in Physics. However, this issue goes beyond Physics and impacts the entire university, if not the whole higher education system in Sweden. We thus recommend action at the highest local and national levels to try to remedy this.

Distribution of teaching loads: Again continuing an issue raised in KoF07, the teaching loads are in some cases unequally distributed over divisions, with a major factor being the relative amount of external funding that is in some sense used to “buy out” one division’s staff from more teaching than another. Some attempt should be made to make this more uniform, in direct connection with the issue of support for positions raised above. We reiterate with a quote from KoF07: “As one reference number in this context, the almost canonical teaching load in the sciences in a research-oriented U.S. public university is 3 lecture hours per week, plus some minimal laboratory or seminar supervision.”

Graduate student support from the university: It was also pointed out to us that the university support for graduate students is effectively declining; in particular, for each PhD finishing, continuing support for a new student is provided at only ¼ of a position, leading in one interpretation to a geometric progression that could lead to essentially no university support in the future. This is again an issue of the continuing shift of research and graduate education support from the university to external funding that is dangerous for the future of quality research in Uppsala, and elsewhere in Sweden.

Gender equity and diversity: Regarding diversity and the gender profile, females are involved in the department’s research at all levels. We met undergraduates, graduate students, and postdocs as well as lecturers and professors. We were impressed by the fact that all of them seemed happy and energized in the environment of the Department of Physics, and that they felt valued as members of the department. This is very positive and we commend the faculty and leadership for being sensitive and gender blind. At the same time, we note that only four women gave formal presentations at the review. Their work and presentations were excellent. The committee also noticed that the percentage of women is low since women represent only about 7% of Full Professors (chair), 8% of Promoted Professors, and 14% of Senior Lecturers. Since
the female doctoral student population is 25%, (21% took the doctoral exam between 2005–2009) and that for postdocs and associate professors is 26%, the pool is certainly available to draw from so as to increase the representation at higher levels. It has been shown that having role models at all levels in a physics department hierarchy is very important for the retention of female students. We thus encourage hiring and promoting more women at the higher ranks. This would have a great impact for the future of physics since it will also enhance the natural retention of female undergraduate and graduate students, as well as those who may decide on an academic career. One graduate student expressed the desire to have a senior female faculty member in each of the divisions and we believe this is a worthwhile goal for the future.

**Computing infrastructure:** The computational resources, including access to the Nordic network and grid, are in general excellent. However, we note that the Astronomy and Space Physics Division is still lacking a suitable medium-size capability to quickly test and debug the simulation programs that are critical to its research; to date this need appears to have fallen into a hole in which the cost of such a capability is too small to qualify for funding at the national level but is not covered by local resources at the university.

**The European Spallation Source:** The ESS represents a major commitment by the Swedish government to the international research infrastructure, and the Physics Department should try to take advantage of it as much as possible, but without compromising its strong research activities that by and large do not at present involve neutron studies of the type represented by ESS. Looking ahead, it may be prudent to consider specialists in the use of ESS as special target areas for future faculty hires. We also comment briefly below on a contract that has been signed between the Physics Department and the ESS involving the construction of the one element of the ESS.

**CAI/ÅMW merger:** The panel received somewhat late a written proposal from the Board of the CAI to merge the CAI with the ÅMW, thus forming a special unit (“särskild inrättning”) within the Uppsala University Faculty of Science and Technology. This proposal emphasizes the growing needs for a mechanical workshop in connection with several projects that are particularly motivated in the area of the CAI, which up to now consists of two mechanical design engineers. For reference, the ÅMW presently consists of eight mechanical designer/technicians, and is estimated to have space for up to twelve, or a 50% increase in capacity from the present status.

However, the panel notes that it did not have an opportunity to discuss the content of this proposal with all involved groups and stakeholders. The proposal stresses the need for such a workshop in connection with a broad range of future activities, but it is at this point not obvious to us that the consultation and planning for this proposal have been broad enough. For example, the ÅMW, which
is a key supporting facility for the Molecular and Condensed Matter Physics Division, appears already to be fully booked, and the proposal itself states that it is now overloaded, but with additional work anticipated in building beamlines and instruments for the MAX IV-Lab, FAIR at GSI in Germany and LHC and CLIC at CERN that are directly related to Uppsala University research. Beyond this are planned involvements in additional major instrumentation projects for ESS (a contract totalling SEK 177 million that has recently been signed committing Uppsala University to develop the RF system of this project) and XFEL in Hamburg (end stations) that are not necessarily directly related to current Uppsala University faculty research, and which appear to represent a major paradigm shift in the scale of instrumentation building at Uppsala. What are envisaged are thus projects at the scale of the national laboratories in the U.S., for example. Although this might in some ways be a useful role for Uppsala University to play on the Swedish national scale in the future, such a major shift does not seem possible without a major increase in staff in all of the mechanical and electronic engineering and design areas. Yet the proposal only seems to discuss adding two additional mechanical technicians (roughly a 25% increase in capacity), while simultaneously also expanding the areas within the university that are serviced to include the full Faculty of Science and Technology.

Additional issues revolve around bigger projects which can to some degree be outsourced and managed by engineers, and smaller projects which are more appropriately carried out via direct scientist interactions with the obviously highly talented ÅMW staff. Large-scale projects also often have externally imposed schedules and deadlines, which could be problematic when colliding with the scheduling of smaller group-oriented projects in the ÅMW. A further concern raised in our discussion of this proposal is the management structure, in which questions can be raised as to whether the engineering staff of CAI would be appropriate line managers of the machine shop, from both a technical and personnel point of view, if that is in fact proposed. Collectively, these comments could lead to a conclusion that the two entities should be left independent, at least for the time being.

The panel therefore cannot at this point give a positive recommendation for the suggested merger, but rather suggests that all partners get together to develop a model for the future, including realistic and quantitative estimates of additional staffing, space, and equipment, as well as management structure, in order to insure that any such combined CAI/ÅMW is an asset to the Physics Department as a whole, and capable of satisfying the needs of all groups within it. Although minor in nature, any such merger might also involve retitling CAI as the Center for Advanced Instrumentation (as suggested in fact in KoF07), so as to avoid the implication in the current name that it could be dominated in usage by the accelerator-oriented High Energy and Nuclear Physics groups. We conclude nonetheless with a statement that in some respects this merger appears to be a reasonable thing to do, provided that it yields a facility of sufficient staffing and resources to accomplish the diverse internal and external projects

Part III: Panel Reports

Panel 13
planned, that the research within the Physics Department which has long been critically dependent on the ÅMW is not adversely affected, and that a collegial governance mode can be established for it such that a suitably broad, but not unreasonably broad, spectrum of Uppsala University researchers can share in the potential benefits.

**Networks and collaborations**
There are extensive networks and collaborations in each of the divisions, both within Uppsala University and Sweden, and essentially spanning the globe in several instances. We comment on these in the specific division evaluations below.

**Opportunities for renewal and emerging science**
There are numerous examples of opportunities for renewal and emerging science in the divisional evaluations.

**Actions for successful development**
Key to the future of the department is dealing with the interwoven funding issues of faculty salary support, teaching load, and graduate student support raised under Research Environment and Infrastructure above. Only if these are clarified do we see a clear path to the stated goal of being truly international and competitive in the recruitment of graduate students, postdocs, and faculty. Taking the fullest advantage of MAX IV, as well as ongoing collaborations at other European facilities such as CERN and GSI, should be a high priority. Consideration should also be given to how to make the best long-term use of the ESS, whose approval seems to have been more political than scientific at the national level, but which is now a major Swedish scientific and government funding reality for the future.

Enhancing the computational resource hierarchy should also be continued, as recommended in KoF07, and to some degree achieved now, but with at least one lingering problem in Astronomy and Space Physics, as mentioned already under Research Environment and Infrastructure.

Efforts should also be continued to recruit and hire so as to improve the gender balance in the department, another issue mentioned above.

Finally, although regular seminars are evidently being held to bring together people from more than one division, we would repeat the KoF07 recommendation to hold regular Departmental Colloquia that are intended for a broader audience, so as to maximize interactions, and education, among the several divisions.

**Effects of the KoF07-evaluation**
We have already commented on two recommendations from KoF07 that were followed (unifying in one department and the creation of CAI), and will mention others in connection with the specific division reviews below.
Other issues
Finally, the committee was impressed with the excitement and enthusiasm expressed by the members of this department at all levels, senior and junior staff, postdocs, and students, during the site visit. It is also positive that in several of the divisions, we noted international outreach activities, for example leading to a significant number of international graduate students, and undergraduate students who come to Uppsala for summer internships.

We now evaluate each division, or in some cases sub-division, in the sections below. The departmental figures for the personnel makeup of each division in June, 2011 are given at the beginning of each review. In some cases, the personnel numbers in some categories as reported to us by division representatives may be slightly larger than those used in making up Figure 2, probably due to individuals who are entirely supported from external sources.

Division of Theoretical Physics

General assessment of the unit
The Theoretical Physics division consists of 1 chair, 4 promoted professors, 3 associate professors, 6 postdocs, 1 researcher, and 11 PhD students.

This is a very strong division working on various aspects of mathematical physics, quantum field theory, string theory and gravity. High quality results are being obtained in a variety of areas ranging from formal and mathematical aspects of the theory to several applications in diverse fields and disciplines, such as pure mathematics, high energy and condensed matter physics, cosmology, and including one individual working in theoretical biology. This diversity is one of the main characteristics that has positively evolved during the recent years.

Particular topics are gauge theory-gravity duality (AdS/CFT correspondence) and integrability; applications of this correspondence to lower dimensions and condensed matter systems; supersymmetry and complex geometry; cosmological applications of string theory; mathematical aspects of string, topological and quantum field theories; and field theory models for the protein folding problem in biophysics.

A continuing problem of this division (noted also in KoF07) is the very heavy teaching load that has not improved after the merging into one department, despite suggestions that this should be done in the new department. This appears to be mainly due to the large number of students whose support requires extra teaching, in the absence of sufficient external resources that are in general more difficult to obtain in such areas of fundamental research.

Quality of research
Results obtained in this group on gauge theory-gravity duality were a world-
leading theoretical breakthrough with enormous impact, a forefront achievement in string theory research. They were based on a novel idea of applying the techniques of integrability from two-dimensional systems to four-dimensional gauge theories that led to the first non-trivial test of the AdS/CFT correspondence. This duality is one of the most influential results in theoretical physics research during the last decade, with far reaching consequences varying from the theory of strong interactions, to new models of particle physics and unification of fundamental forces, to radical ideas of how gravity is realized in nature, and extending to the resolution of the information paradox problem in black holes. More recently, these techniques were extended in three dimensions, opening a new area of applications in condensed matter systems, also a world-leading result. In addition to these studies, other first rate results with high international impact were obtained in all areas of research activity, and highly cited papers have resulted.

The (unrelated) activity in the modelling of protein folding represents a very interesting new approach and first results look promising, but a closer interaction with people in structural biology and biochemistry would seem essential for positive further development.

A general positive note for the future is that the junior faculty activities are world class.

Finally, we also note outstanding internationally-recognized theoretical work in the Division of High Energy Physics on particle phenomenology. The main research topics are the quark gluon plasma in heavy ion collisions and charged Higgs physics in theories Beyond the Standard Model. The activity of this group is closely related to the particle physics experimentalists with whom we note positively that there are common publications.

Research environment and infrastructure
There has been an important evolution of the faculty in recent years. Several professors were hired but left after a few years stay, while others are part time elsewhere and one new position is not yet filled after unsuccessful offers. Of course, it is one sign of high-quality staff that they are also attractive to other institutions, but one factor could be that the teaching load of this division is too high compared to that of its competitors. Another factor that we mention several times in this report is the need for Uppsala University to guarantee the funding of some PhD students in order to reduce the teaching load of high quality researchers.

Networks and collaborations
This division has excellent international collaboration and interactions. Moreover, it has close ties, common activities and collaborations with Nordita since its recent transfer from Copenhagen to Stockholm. Finally, this year it hosted the annual international conference ‘Strings 2011’ which is the main event of string-theoretical physics research.
Opportunities for renewal and emerging science
The interactions with the theorists in the High Energy program working on particle phenomenology, which were minimal in the past, have been improved after the merging in one physics department, with common seminars and teaching courses to the students. However, the Theory and High Energy Divisions should seriously consider taking one further step by merging these two activities in a larger Fundamental and High Energy Theory Division, which would then cover the whole spectrum of high-energy theory, from phenomenological applications of QCD, to physics Beyond the Standard Model, string theory, cosmology and gravity.

Actions for successful development
The department and the division are strongly recommended to pursue the current hire of the unfilled faculty position (lecturer/professor), if possible with a specialty providing a link between the phenomenological approach of high-energy theory and string theory.

Effects of the KoF07-evaluation
The merging in one department of physics had a positive impact in science and enhancing interactions with other groups and in particular among all theorists in physics, but had no practical effect in financial matters such as funding PhD students and solving the problem of heavy teaching load. Of the two faculty positions opened upon recommendation of the panel, one was filled with a very positive effect while the second remains to be filled.

Other issues
Doctoral/postdoctoral training seems excellent. PhD graduates and former postdocs appear to have no problem finding the next position, either in academia or in industry.

Division of High-Energy Physics

General assessment of the unit
The High Energy Physics (HEP) Division consists of 1 chair, 5 promoted professors, 5 associate professors, 6 postdocs, 3 researchers, 7 engineers, and 10 PhD students.

This division deals with accelerator particle physics and astroparticle physics. It is also involved in a substantial program of R&D and construction concerning accelerators and detectors, some items of which have only recently emerged and are still under discussion.

The goal of accelerator particle physics, at the forefront of its energy domain, is to re-create, in a microscopic way, the conditions of the early universe,
10^{-12} seconds or so after the Big Bang. In particular, the LHC (Large Hadron Collider) at CERN has started exploring the energy domain during which the universe underwent a phase transition and should allow us to understand how the elementary particles acquired their mass. It will test the Standard Model of particle physics by searching for the last as-yet-unobserved particle predicted by it, the Higgs Boson, but this search may also reveal physics beyond the Standard Model. The LHC may also reveal the existence of a mirror population of particles (via Supersymmetry), the origin of the mysterious dark matter in the Universe and perhaps some “large” (but less than a few microns) extra dimensions of space.

The Uppsala group is heavily involved with the ATLAS experiment at the LHC. This experiment began taking data in fall 2009 and has already accumulated under excellent machine conditions an integrated luminosity of 1 inverse femtobarn. The ATLAS list of publications is already quite long (40 papers up to now). The full nominal energy and instantaneous luminosity of the machine will be attained around 2014. The coming decade of results will thus be a most exceptional period for particle physics.

Astroparticle Physics exploits the particles coming to us as “messengers from the Cosmos” to learn about the history of the Universe and, among other things, looks for relic particles from the Big Bang, with neutrinos of particular emphasis. Following the involvement of some of this group in AMANDA, they are now key players in ICECUBE, a large Antarctic sub-ice detector focusing on neutrino Astroparticle physics, which is now complete. The Uppsala group has a leadership role in Deep-Core, a future more finely instrumented central region of ICECUBE, which provides a lower threshold (10 GeV) for neutrino detection that is well suited for indirect dark matter searches.

As in the KoF07 review, the panel appreciates the continuing trends in the growth of high energy physics at Uppsala and the progress accomplished in many domains. We note several positive aspects of the program:

- The group is pursuing several programs at forefront machines and detectors, including present and future experiments.
- It is strongly focused on two world-leading research programs, one in accelerator particle physics (the ATLAS experiment at LHC) and one in Astroparticle physics (ICECUBE in the Antarctica).
- Within these programs, it has a high profile by performing activities connected with key aspects of the instrumentation and of the physics analysis.
- It is concerned about long-term developments in particle physics and plays an important role in the accelerator and detector R&D that is essential for this.

**Quality of research**
The Particle Physics Division at Uppsala participates most effectively to the world-leading top-quality research projects quoted above, occupies in both strategic positions, and is generally quite visible and recognized internationally.
It maintains a good balance between accelerator particle physics and astroparticle physics. The chronological sequence of the division’s programs has been well-focused and coherent. Moving the two foci from D0 at Fermi Lab (to be stopped this fall) to ATLAS and “adiabatically” from AMANDA to ICECUBE was quite logical and well managed, and allowed the group to exploit optimally the experience obtained from the first two experiments.

The success of the High Energy Division is due both to a clever, energetic and stimulating leadership, and to the high level of competence of the main actors in each of the subfields and projects involved.

The panel appreciates the remarkable and successful efforts made by this group in the matter of data handling and computing. This has led in particular to an overall Nordic Tier-1 network of ATLAS, with a node at Uppsala University. The first year of data has demonstrated that the Nordic Tier is among the most efficient of all ATLAS centers and that its ARC middleware is the most stable and performing one. Grid computing, in general, has also been and is still strongly pushed by Uppsala University for Sweden and the Nordic countries, in particular within the EU framework.

The group had already shown in DELPHI at LEP, in D0 and in AMANDA its strong motivation and its competence in data analysis and physics extraction. The continued search for the charged Higgs Bosons in ATLAS, even if it may at first sight appear to be a narrow research window, actually implies a study in depth of various classes of event topologies which are also promising for other physics topics, both within the Standard Model and beyond it. Furthermore the group has refined its analysis strategies and diversified its analysis topics. The phenomenological theory group is also contributing by increasing the variety of the final states to be explored.

In neutrino astrophysics, both AMANDA and ICECUBE have already led to a large set of results, unfortunately so far only putting many upper limits on the most optimistic models, with of the order of 30 papers published in the last two years by ICECUBE. Future experiments should permit more definite physics to be extracted.

There is a long tradition of innovation and excellence in instrumentation in HEP at Uppsala University. We especially underline the importance of its contribution to the design and construction of the CTF3, a test set-up of a possible future multi-TeV electron-positron compact linear collider CLIC, and the leading position of Uppsala University in its key component, the two-beam test stand (TBTS), which has recently demonstrated that an accelerating field of 100 MV/m can be achieved.

In connection with instrumentation developments, the KoF07 panel enthusiastically supported the realization of the CAI platform in order to enhance the instrumentation developments of both High Energy and Physics (Fysikum) and is very pleased that it came into existence, with a judicious choice of hired people. It offers to Uppsala University a significant enhancement of its capabilities as a center of R&D and construction, with a strong expertise in design and
construction of accelerator and other instrumentation components that should benefit the unified Physics Department as a whole. The panel was recently informed of the project to fuse CAI with the Ångström Lab mechanical workshop, a long-standing facility that is also used heavily by other divisions, especially Molecular and Condensed Matter Physics. We comment on this further as a general item in the Introduction to this report.

Looking to the future, ATLAS physics analysis is well underway in Uppsala University, in very good conditions of access to the data, and will continue for one to two decades. Long term postdoc resources and increased graduate student resources are needed to take advantage of this. For LHC, besides reaching the nominal energy of 14 TeV, the evolution foreseen consists in a gradual increase of the luminosity towards the nominal one ($10^{34}$) and beyond (the High Luminosity LHC, around 2020). This latter phase will require from the experiments a set of upgrades, implying a substantial R&D program.

For the ATLAS upgrade, the group has focused its activity on the key sector of the trigger and leads the track trigger group studying innovative ways to maintain the present trigger rate at higher luminosity. They collaborate in the inner tracker upgrade project in ATLAS. They participate within AIDA (EU FP7 project) to study 3D integration of electronics. With non-HEP groups they study wireless data transmission. Within Sweden they collaborate in semiconductor detector development. These activities are innovative and well-focused.

For neutrino physics, the near-term objective of looking for indirect dark matter in the Deep-Core array of ICECUBE with a few PhDs is a judicious choice and exploiting its physics is a must. Concerning postdoc and graduates, the panel has the same remark as above. Considering the future, after ICECUBE, the goal of neutrino astrophysics is to go far beyond the km$^3$ size and this implies changing the detection technique from optical to acoustic and/or radio. The Uppsala group has developed expertise on the former and could, among other possibilities, join the ARIANNA set up which plans to use both. However the group studies also the possibility of a conversion to gamma ray astronomy with the CTA (Cerenkov Telescope Array). It seems to the panel that opening an activity in gamma ray astrophysics would imply a reconversion of the group to this new domain, and this change should be weighed carefully.

Considering the available personnel in these two groups, one could ask whether the goals are too ambitious. However, as we said, they involve only two long-term programs, to which Uppsala University is already committed, ATLAS and ICECUBE. The panel considers that both are highly relevant. The coming decade in ATLAS is tremendously promising and Uppsala University is most active and recognized in strategic sectors of the experiment. Coping with any difficulty in staffing level, if such shows up, could be achieved through a reinforcement of the teams with new scientific staff and a further increase of collaborative activities at the national and international levels.
Research environment and infrastructure
The environment of the Ångström Laboratory seems to be excellent in all respects. About 25% of the senior activity of the group is teaching, which is of high quality, stimulating and well received by the students.

The division is also highly visible, playing active and sometimes leading roles in a variety of EU (FP7), Nordic and Swedish initiatives concerning developments in computing infrastructure, accelerators, and detectors.

We note that large centers like CERN can be a strong asset in the training and professional development of young physicists and engineers for both research and industry, in that they provide an ideal and challenging international high-technology environment in which to grow, and suggested that Uppsala University review this possibility from an institutional perspective. We note that the CAI and future projects for Max IV and ESS should be very useful in this respect.

Networks and collaborations
By its nature HEP requires a high level of collaboration and networking at a national and international level. It is a fact that HEP cannot be done without extensive international collaboration.

In this respect, as we have noted above, the Uppsala University situation and attitude are excellent. It has been very successful at building and exploiting all possible synergies inside the experiments. The Swedish ATLAS groups collaborate closely, under the leadership of Uppsala University. The Swedish share of ATLAS investment and population is about 2%, similar to Sweden's share at CERN, and ensuring a good visibility of Sweden in the experiment.


We have also already mentioned the demonstrated success of the computing network, and the key role of Uppsala University in its implementation. And we also note the potential of CAI to develop multidisciplinary collaboration, e.g., for next-generation detector development for synchrotron radiation research that is a key strength of the Molecular and Condensed Matter Physics Division.

Furthermore the collaboration between experimentalists and theorists in this group is excellent. This is a key asset, in particular to master the analysis and the understanding of LHC physics channels. Whatever is the future structure of theory in Uppsala University, this close and fruitful interaction must be maintained.

Opportunities for renewal and emerging science
As noted above, the High Energy Physics Division has presently 20 research staff over all levels, 7 engineers, and 10 PhD students. This is marginal, given
the number of projects in which they are involved, the opportunity offered by the startup of the LHC, and looking ahead to future retirements or other commitments.

It is most important to recruit PhD students and postdocs for this project. The start of LHC physics is indeed a particularly favorable and rewarding period to offer positions to young researchers, in order to get a maximum out of the new data, a possibility that is already being exploited in other countries.

The long-term future of particle physics depends on both the physics results which will be obtained, especially from LHC, and a vigorous continuation of R&D programs in the matter of accelerators and detectors. The Uppsala University group is deeply involved in such matters in key sectors as: CTF3 for CLIC, already discussed, the development of radiation-hard 3D Silicon Detectors, in particular in view of the ATLAS upgrade, acoustic (and radio) detection of atmospheric neutrino showers for ICECUBE and beyond. Uppsala University has already successfully tested such prototypes, and these are now installed in situ. The panel highly appreciates these activities, already well underway, and to which CAI can bring a decisive boost, provided it continues to be properly staffed.

As far as theory is concerned, the panel recommends that the theorists continue to diversify their work on various physics topics beyond the Standard Model.

**Actions for successful development**

We reiterate the need to hire appropriate younger scientists in order to take full advantage of the possibilities offered. However, since the 2007 review, some new concerns have appeared:

- The first is the imminent retirement of the inspirer and long-time leader of the High Energy group. Efforts should be made to insure that the group can benefit as long as possible from his experience and national and international stature and to find a successor of the highest caliber.
- The second concern, which appeared quite recently, is linked to the decision to put the ESS in Sweden and to the changes in the overall research funding and infrastructure scenery that such an enormous project will induce. Care should be exercised that this huge project does not adversely affect the other high-quality research in the country. The panel appreciates the strong boost the ESS could bring to Swedish science and to Uppsala University activities. However, seen from the point of view of particle physics, it is hoped that these activities, in particular the future Uppsala RF Test Stand, can be managed without affecting the other projects underway or foreseen in the Uppsala University group for CLIC, MAX IV, XFEL, as well as for FAIR, which represent already a substantial enterprise.

**Other issues**

The panel was again very favorably impressed with the younger scientists and students in this group.
Division of Nuclear Physics (including Global Energy Systems)

General assessment of the unit
The Nuclear Physics Division consists of 1 chair, 3 promoted professors, 1 associate professor, 1 postdoc, 4 researchers, 2 engineers, and 9 PhD students.

This program is focused on a few top-quality projects in hadron physics and nuclear structure research which we have found to be coherent and logically sequential in time involvement since the KoF07 report. The Wide-Angle Shower Apparatus (WASA) experiment, formerly at the Celsius facility in Uppsala, has been moved to the Cooler Synchrotron (COSY) in Jülich, and this represents a well-chosen, low-cost opportunity for research of a high international standard. It has been put in operation in 2007 and in 2009 the first data on isospin symmetry violation in the $\eta \rightarrow 3\pi^0$ decay, which gives access to the light quark mass difference, has been published. In addition, collaboration in world-leading programs in hadron physics will follow with the PANDA experiment with stored antiprotons at the future Facility for Antiproton and Ion Research (FAIR) in Darmstadt, founded in 2010. This will be the major European facility for Heavy Ion and Hadron Physics for the next two decades. The Advanced Gamma Tracking Array (AGATA) detector for nuclear structure physics using radioactive beams at various European facilities such as the large accelerator for heavy ions in Caen (GANIL) and its SPIRAL2 project for radioactive beam experiments, the Instituto Nazionali Fisica Legnaro (INFL) in Legnaro and the GSI in Darmstadt will be later also used, as well as the world class radioactive beam facility at FAIR. These projects represent excellent exploitation and utilization of previous experience in antiproton physics at the CERN Low-Energy Anti-Proton Ring (LEAR), hadron physics at CELSIUS in Uppsala, and creative technical developments by the nuclear physics group, as, e.g., hydrogen-pellet targets, the WASA detector construction and the AGATA development. Recently the Uppsala University nuclear physics group joined the KLOE-2 collaboration which operates a multi-purpose $4\pi$-detector at the DAΦNE $(e^+e^-)$ collider in Frascati for resonant production of $\Phi$ mesons at increased luminosities using the newly developed “crab waist” collision scheme. It will be favorably used for decay studies of $\eta$, $\eta'$ and $\omega$ mesons.

Quality of research
The hadron physics group at Uppsala University took a leadership role in the LEAR program at CERN with world-leading research in meson spectroscopy and the search for QCD exotics such as “glue-balls” in low energy antiproton-proton annihilation.

The group has also been involved in internationally high standard studies of meson production near threshold using the CELSIUS storage ring. With WASA at COSY and KLOE-2 at DAΦNE the Uppsala University group will continue their top-class studies of forbidden $\pi^0 \rightarrow e^+e^-$ decays, radiative $\eta \rightarrow \pi^+\pi^-\gamma$ decays,
of isospin symmetry in $\eta \rightarrow \pi^+\pi^-\pi^0$ decays, light meson ($\eta, \omega$) transition form factors, and the study of the dynamics of the $\eta' \rightarrow \eta\pi\pi$ decays.

For the future, the hadron physics group has joined the PANDA collaboration at FAIR in Darmstadt, with one group member as spokesperson for the precision spectroscopy of new charmonium states (X, Y, Z) and the search for QCD exotics, such as glue-balls and hybrids. These experiments probe the transition region from non-perturbative low energy QCD with quark confinement and spontaneous chiral symmetry breaking, with this effect creating the large hadron masses of the visible universe, to the perturbative QCD regime involving the well-studied asymptotic freedom of the quarks at high energies. This will become a world leading research project that ideally matches the know-how and experience of the Uppsala University group and therefore is very cost effective. Particular contributions of the institute to these activities will be a hydrogen pellet target and a high resolution $\gamma$-calorimeter for PANDA.

The nuclear structure group is continuing the development of the high resolution $\gamma$-detector AGATA, a European project for the study of nuclear structure far off the line of nuclear stability at various European heavy ion beam facilities, such as the SPIRAL2 radioactive beam accelerator at GANIL, at INFL and GSI. Recently evidence for the long sought spin-aligned neutron-proton pairing phase was found in the isospin 0 nucleus $^{92}$Pd with 46 neutrons and 46 protons in a world class experiment at GANIL, using the $^{36}$Ar + $^{58}$Ni $\rightarrow$ $^{92}$Pd + 2n + $\gamma$ reaction, resulting in a paper in Nature.

Research environment and infrastructure
The existing infrastructure in terms of the personnel composition is considered as satisfactory, with this including the experience of the in-house experiments with the CELSIUS storage ring, the previous antiproton experiments at LEAR, the ongoing project with the WASA detector at COSY and the KLOE-2 project at LNF. Following our KoF07 recommendation the vacant chair-professor position was re-occupied with an experienced scientist in the field of hadron physics; an experienced professor in the field of chiral dynamics was appointed, and positions for a senior lecturer, a researcher and a postdoc were filled. From a personnel point of view, the division seems healthy.

Networks and collaborations
The hadron and nuclear physics groups were members of the EU I3 HP and EURONS programs and are supported by the corresponding 7th EU framework program. These are excellent, highly rated and well financed European collaborations which are essential for the WASA, AGATA, KLOE and PANDA projects.

Opportunities for renewal and emerging science
After the closing of CELSIUS, the nuclear physics group went through a drastic renewal phase by taking up the present hadron physics programs at COSY,
DAΦNE, initiating the PANDA project at the FAIR facility, and joining the KLOE-2 project at LNF. These are all reasonable steps for the future.

**Actions for successful development**
Enhancement of the theory effort in the field of non-perturbative QCD, was successfully fulfilled by hiring a young theory professor, whose small group is very active in chiral dynamics.

**Other issues**
We were very impressed with the students and young researchers we met.

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**Global Energy Systems Subdivision**

*[Also evaluated by the Earth Sciences panel, see page 371.]*

**General assessment of the unit**
This smaller-scale activity that is officially housed within the Nuclear Physics Division, consists of 1 professor, 1 researcher, 2 PhD students, and 4 Masters students.

The group focuses on energy resource research, and in particular future projections of the availability of fossil fuels, including its eventual decline. This work thus addresses a highly relevant and important question for future energy policy, with strong implications for global warming and economical models. The research of the group has successfully continued since the last review and produced some very interesting results. Specifically, they have predicted that the world supply of oil and natural gas is now at a peak (often referred to as “peak oil”) and will subsequently decline to zero in about 2100 due to a lack of new sources for exploitation. This work has been published in peer-reviewed journals, in which some of their conclusions strongly contradict those of at least one major international group involved in the same projections. This has potentially very important implications for the scenario of climate change over the next hundred years, and has brought international recognition to the group. A book is also in preparation that will summarize the group’s research to date.

**Quality of research**
We would rate this work as internationally recognized, and note, with comment below, that it has also been positively reviewed by panel 16 (Earth Sciences).

**Research environment and infrastructure**
This appears to be adequate, and the ratio of this program’s external funding to faculty funding is very high at about 2.5.
Networks and collaborations
The group is one of a few in the world pursuing such “peak oil” peer reviewed research, and it has decent collaborations with groups in Oxford, Groningen, Manchester, and companies in Germany and China.

Opportunities for renewal and emerging science
As the KoF07 panel noted, we are not sure whether this research really belongs in the Physics Department. It might be better allocated in a multi-disciplinary activity together with other fields such as geo-sciences, economy, and sociology. We also note that this activity has been reviewed as well by panel 16 (Earth Sciences), who are positive concerning its activities, and suggest that it might be relocated to the Earth Sciences Department, and more closely affiliated with the Centre for Sustainable Development there, as well as with the multi-university STandUP initiative.

Actions for successful development
See paragraph above on possible affiliation with the Earth Sciences Department. Also critical to the future of the program is the replacement of the leader/founder of the group at his imminent retirement.

Division of Applied Nuclear Physics

General assessment of the unit
The division of Applied Nuclear Physics consists of 1 promoted professor, 8 associate professors, 5 postdocs, 10 researchers, and 19 PhD students (14 from Physics, 5 from other departments).

It has a broad research program with focus on i) Fusion Diagnostics; ii) Ion Physics; iii) Nuclear Fuel Diagnostics and Safeguards; and iv) Nuclear Reaction Research. This division represents a very positive result of the Uppsala University renewal process brought about by merging groups from more applied disciplines, such as neutron and ion physics.

Since KoF07 there have been several interesting additions in collaborations external as well as internal in the Applied Nuclear Physics Division of Uppsala University, which have enriched the scientific program of the Department of Physics considerably and broadened the impact of its more applied research. Via the research and outreach programs of this division, nuclear physics know-how is transferred to tomorrow’s nuclear energy systems, to generation IV reactor materials, to biomedicine, to education and to industrial and public outreach. The increased volume of research and education has resulted in an increase of the staff and the funding, and this has been augmented by the addition of the Ion Physics program from the Department of Engineering Sciences. As a result, some exciting new top-class goals have been put forward, such as building, operating and exploiting...
ITER’s neutron spectrometers and cameras, constructing a prototype of a liquid-lead cooled Fast Reactor in Sweden, performing a total Monte Carlo nuclear data evaluation and sensitivity feedback, and developing new applications in nuclear medicine, all world-class applied projects. We comment more specifically below.

Quality of research
The Fusion Diagnostic group has developed a top program using a time-of-flight spectrometer for measuring neutron time of flight spectra of a hot fusion plasma to detect fast ions which can trigger plasma instabilities and correlated losses. This will become an important method for the ITER burning plasma physics.

The Nuclear Reaction Research Group produces in an internationally high standard program with intense proton beams (100–200 mA, 30MeV) and fast neutrons for measuring independent fission yields with long term goals of fission model developments.

The Nuclear Fuel Diagnostics and Safeguards group reported a top-class program for studying of void distributions in power reactors using neutron tomography.

The Ion Physics group developed a world-class program of Biological Accelerator Mass Spectrometry (AMS), and a new program using Intra-Cavity-Optogalvanic Spectroscopy (OGS) with the long term goal to replace AMS. The mission of these programs is mapping human cells’ regenerative properties with the roadmap to analyze small (AMS) and ultra-small (OGS) samples. Within this group is also essential materials characterization activity making use of ion scattering, in particular Rutherford back scattering.

Research environment and infrastructure
The research environment of the applied nuclear physics division is appreciably improved by merging neutron physics and ion physics into a well-staffed and increasingly better funded research and educational entity, with a total of 19 graduate students, about half of which appear to be supported externally. Its infrastructure in terms of instrumentation and technical support of complex multi-disciplinary projects is top class and is steadily developing so as to attack new projects of frontier sciences and technologies.

Networks and collaborations
Networking and collaborations have been greatly extended since KoF07 within Uppsala University and especially externally.

With the Materials Theory division and the Department of Chemistry generation IV reactor structural materials are developed in a top-level program. An IAEA competence center for nuclear power safety was established with the division of Contract Education. A top-class program for the study of lead corrosion in generation IV nuclear power reactor materials was initiated with the division of Condensed Matter Physics.
We were also informed about an impressive number of external collaborations, such as, a top level generation IV nuclear power reactor material development - GENIUS - with Swedish Universities (financed by the Swedish Research Council); an international-standard next generation Safeguard Initiative - NGSI - with the Los Alamos National Laboratory, and UC Berkeley; a top level collaboration with the International Fusion Experimental Reactor - ITER - built in Cadarache, France; the international-standard agreement - EFDA - with EURATOM for a coordinated effort in fusion research, including the operation of JET; a top level collaboration with GANIL, France, on Neutrons For Science - NFS - using SPIRAL-2 a radioactive beam facility under construction; an international standard collaboration with the upgraded IGISOL facility, nIGISOL, in Jyväskylä, Finland; and a top-level collaboration on Regenerative Medicine with the Karolinska Institutet. In addition the division contributes very actively to European and International Networking activities, such as IAEA, ITER, JET, the OECD reactor project Halden, UAE competence building and others.

**Opportunities for renewal and emerging science**
The division will build, operate and exploit ITER’s fast neutron spectrometers and cameras to study and control a world class prototype fusion power facility under construction in Cadarache, France. It will also be involved in constructing and operating a liquid-lead cooled fast reactor demonstration facility in Sweden scheduled for completion in about 2020, a world leading project. It will also continue to develop total Monte Carlo nuclear data evaluation for power reactors for feedback control of the power generation process, a program of international recognition.

**Actions for successful development**
As one particularly exciting area for future development, a world-forefront area of biologically and medically relevant research is in developing new techniques for small sample AMS and OGS for new applications in regenerative medicine. These technique can answer questions, such as, how old are various cells in the human body, in the skin, the heart and brain, and is there a measurable regeneration of cells in various diseases, and other fundamental information for regenerative medicine and stem cell research? Other important areas for exploitation have been mentioned under Opportunities for renewal and emerging science.

**Effects of the KoF07-evaluation**
The KoF07 evaluation seems to have led to a very interesting and important renewal process of the activities of a Department for Neutron Physics towards programs of enormous importance for the development of methods and facilities for energy creation and inventive medical applications. It has also led also to better understanding of the national importance of nuclear methods in technology, biology, and medicine.
Other issues
We were most encouraged to see how many excellent students understand the importance of this field of advancing technology, biology, and medicine using nuclear techniques.

Division of Astronomy and Space Physics

General assessment of the unit
The Astronomy and Space Physics Division consists of 2 chairs, 3 promoted professors, 6 associate professors, 7 researchers and postdocs, and 12 graduate students.

This research program is nicely balanced between observation and theory, including atomic theory related to spectroscopy with a significant connection to space physics. The division has continued to perform world-class research concerning the spectroscopy of low-mass stars, with emphasis on determining elemental abundances. This work is of great importance for studies of stellar populations in distant galaxies, and provides fundamental support for analysis of data from the forthcoming GAIA astrometric mission of the European Space Agency (ESA). The observational and modelling investigations of stellar magnetic fields are world-leading. The computational efforts addressing mass loss and the dynamic atmospheres of evolved stars are of very high quality and address a very important problem in astrophysics. The strong program in Solar System studies is now being extended to encompass exoplanet systems, though developing a significant presence in the latter field will take time and must involve extensive outside collaboration. An important factor in the department’s activities has been its success in attracting external funding, as evidenced by the 1.31 ratio in Figure 2(d). Overall, the division supports a very broad set of research areas that are nevertheless complementary in many aspects. Finally, as in the last review, the panel was impressed with the activity, excellence, and enthusiasm among students, postdoctoral fellows, and faculty.

Quality of research
The major strength of research in the division is in the study and modelling of the atmospheric spectra of low-mass stars, broadly defined. This work is essential for, among other things, understanding the origin of the elements, and for interpreting the spectra of distant galaxies for investigating their evolution. Of particular significance in the near- to medium-term is the development of an improved database of stellar spectra in support of the ESA GAIA mission, which is likely to revolutionize our ability to characterize stellar populations in our galaxy. The Uppsala University group is part of an international collaboration working in advance of launch to develop data analysis software, specifically for the determination of stellar parameters from GAIA observations. This
effort involves the computation of theoretical stellar atmospheres in combination with detailed observations to calibrate the models, including necessary improvements in atomic physics, a task which the divisional group is supremely well-qualified to undertake. More broadly, the divisional effort involves contributions to databases of stellar atmospheric models, atomic physics parameters, and computer codes of substantial value to the broader community. For example, calculations taking into consideration H collisions, seem to provide better agreement of strong line profiles with observations.

Another area of world-class excellence is the development of instruments that have greatly advanced the detection of stellar magnetic fields and their spatial structure. This is a field that has developed enormously in the last decade, and has great promise for understanding the origin of stellar magnetic fields, with consequences for understanding solar-type magnetic activity (coronal emission, etc.). The division is poised to play a world-leading role in this area.

There is a significant amount of activity in the division aimed at understanding the outer atmospheres of red giant stars. Mass loss from these objects is an important factor in stellar evolution, but it is poorly understood. The time-dependent calculations of the atmospheres and winds of these objects, supplemented by near-infrared interferometry, appear to be of high quality but are limited by computing resources (see below).

Another major activity in the division is the study of solar system objects. Modelling has now shown that both the effects of galactic tides and perturbations from nearby passing stars must be included to understand the delivery of comets from the distant Oort Cloud to the inner solar system. This is an area that will be greatly advanced by the ability of GAIA to detect fainter nearby stars than possible with the previous space astrometric mission. Studies of charged particles and plasma effects in the rings of Saturn being conducted using data from the Cassini mission are also of interest, as part of a successful ongoing collaboration with the Uppsala branch of the Swedish Institute for Space Physics (IRF).

Finally, the division has a small but significant effort in extragalactic astronomy, including both studies of galaxy formation, escape of ionizing radiation from star-forming galaxies which is of great importance to understanding the reionization of the universe, and the evolution of stellar populations and the implications of this evolution for galaxy formation.

As noted in the previous report, the panel also notes the continuing success of the Uppsala University group in obtaining observing time using the largest telescopes of the European Southern Observatory (ESO), justifying the modest government investment in ESO. In addition, the divisional members have had a strong publication record, as commented upon previously in connection with Figure 2.

The major near-future issues for this division include the possible development of spectroscopic instrumentation (for example, the SIMPLE near-IR high-resolution spectrograph for the extremely large ground-based telescope project of
ESO: E-ELT), and the possible creation of a center for planetary studies, with an emphasis toward understanding planets around other stars. The first item will involve collaboration with other groups in Europe, especially given the magnitude of the project. In the area of (exo)planets, a proposal for a Center for Advanced Studies of Planetary Systems was not successful, but the division intends to propose again to create such a center. Given that the architectures and natures of planetary systems, and especially the search for habitable earths, will be a major theme in astronomy over the next few decades, the panel supports this effort.

**Research environment and infrastructure**

A key strength of this division in experimental work is the development of improved spectroscopic instrumentation, and in this they are internationally well recognized. The HARPSpol instrument appears to be very successful. The development of large instruments needed for the E-ELT will require the formation of large experimental consortia. The group should attempt to maintain its involvement in instrumentation projects, and suitable support from the university will be vital in this respect, via CAI and outside of it as well. Here again, sufficient access to CAI and the ÅMW appear essential for success.

Modern astronomical and astrophysical research is highly computationally-intensive, both for theoretical work and data analysis. A particular need, and one that is common in the astrophysical community, is rapid access to small compute clusters to test algorithms and methods, especially for parallel processing; it is highly inefficient to use grid multiprocessors for code development, given the slow turn-around time. Similarly, there is a need for suitable data storage in the era of large observational databases what will come from upcoming facilities such as the Atacama Large Millimeter Array, the Large Synoptic Survey Telescope, and others, along with good visualization capabilities. The KoF07 report noted inadequacy in the local computational support, and this problem of data storage has been resolved, but not that of computing clusters. One approach would be to put a local cluster, with of the order of 128 processors, at the disposal of the division. Another approach that is being investigated in the USA is the development of large-scale multiprocessor facilities, with individual investigators allowed to “buy” blocks of time (perhaps with some mixture of external and internal funds) with the promise of rapid turn-around. This avoids proliferation of clusters and centralizes support. But for such an approach to be successful, it is necessary to have enough capacity that “on demand” modest-scale jobs can be run with turn-around times of minutes to hours, not days. These are crucial for debugging software, for example.

The group has 16 “senior” personnel (professors, lecturers, and postdocs) and 12 graduate students. There is a strong track record in attracting external funds (as noted above), which provides an independent assessment of the great vitality of the division. We found the level of enthusiasm among all groups to be high. While the division hosts a wide variety of activities, we did not find it to be particularly spread too thin.
The division is currently advertising a professorial position to replace a retiring member of great stature, so the selection of the candidate is obviously a matter of great importance.

Networks and collaborations
Beyond an obvious and extensive set of international collaborations through the projects mentioned above, the panel took note of the close relationship with the Uppsala branch of the Swedish Institute for Space Physics (IRF), whose staff is also active in the graduate education of the department. The interaction with the plasma physicists there led to a set of interesting results attempting to connect Cassini observations with the physics of protoplanetary (planet forming) disks, and in agreement with the previous report, we hope that the IRF will also play an active role in a proposed Center for Advanced Studies of Planetary Systems.

Opportunities for renewal and emerging science
Unlike the last report, there was no formal discussion of the establishment of a Center for Advanced Studies of Planetary Systems, though a new proposal appears to be planned for this center next year; the panel supports the general idea of such a proposal. The issue of moving the solar astronomers associated with Swedish solar telescope on the Canary Islands was similarly not raised, and seems to be undecided at this point, with an alternative being to move the group to Stockholm.

More broadly, advance planning should be undertaken such that the division can participate in instrumentation projects for upcoming telescopes, especially the E-ELT.

Actions for successful development
The most important near-term action that would provide a very cost-effective improvement in the productivity of the division would be to enhance the computing environment, as discussed above. Hiring a world-class replacement for a retiring professor is also critical.

Effects of the KoF07-evaluation
The overall most important recommendation of the KoF07 evaluation, absorbing the then-astronomy department into a single physics department, was implemented successfully. The other major near-term recommendation, enhancing the computational facilities of the division, has not been undertaken, and we have already mentioned this as a necessary action at the beginning of this report.

Other issues
We found the graduate students and postdoctoral fellows to be an impressively talented and enthusiastic group.
Division of Molecular and Condensed Matter Physics

Overview comments
This division consist of 9 professors, of which 6 are promoted, 5 associate professors, 8 postdocs, 12 PhD students, and 2 supporting engineers.

This division specializes in electron and photon spectroscopies to study atoms, molecules, clusters, solids, and surfaces. Two primary emphases are atomic and molecular physics (often referred to simply as AMO), more broadly defined to include cluster science as well; and studies of condensed matter phases, often interacting through their surfaces and interfaces. Below, we distinguish these two in responding to the evaluation criteria.

One of the key strengths of this division continues to be the development of unique instrumentation for spectroscopy, thus carrying on a long tradition in Uppsala. These instruments are then applied to a wide variety of problems in gas-phase and liquid-phase physics, complex materials, nanomaterials, surfaces and interfaces.

We were impressed with the continued success in developing world-leading instrumentation, with some examples of this as follows:

- The soft X-ray grating spectrometer development which has achieved 10 meV resolution is a world-class development, allowing the study of electronic states, vibrational effects, phonons, and magnons, in X-ray emission (XES) and resonant inelastic X-ray scattering (RIXS) with unprecedented resolution. This opens up an entire new world of physics with XES/RIXS, a technique that was in fact pioneered in Uppsala. The extension into the ultra-soft energy range around 75 eV will provide a tool for new spectroscopic studies around important p- and f-edges, nicely complemented by the use of the Fourier Transform spectrometer mentioned in the next item.

- The first demonstration of a Mach-Zehner Fourier-Transform spectrometer in the VUV domain up to ca. 100 eV should open up absorption studies of atoms, molecules, and solids with unprecedented resolution in the future, with proof of principle measurements already in the 10,000 resolving power, and the promise of achieving up to ten times that.

- The angle-resolved time-of-flight spectrometer (ARTOF) has achieved a world-leading combination of high transmission, momentum resolution and energy resolution, allowing the measurement of band dispersions in orders of magnitude shorter time scales, as for example demonstrated with data obtained for Bi$_2$Se$_3$. Being able to study both valence levels and core levels (including structural information from X-ray photoelectron diffraction) with this system will expand its capabilities enormously. The development of ARTof is also aimed at the use of pulsed sources which are just coming up with FELs and HHG lasers. Getting a factor of 250 times higher transmission without loss of energy resolution is a remarkable achievement and will certainly provide a new insight into the electronic properties of such forefront materials as topological insulators, organic semiconductor
crystals and also chemically modified graphene. It will also further open the field of coincidence measurements with pulsed sources. This instrument has in fact already been commercialized and should lead to a new generation of time-resolved studies that are just beginning, at both third-generation synchrotron radiation sources and the free-electron lasers that are just starting to produce exciting new data in the time domain.

- **Photoelectron spectroscopy on liquids** was also pioneered at Uppsala, and the developments of instrumentation for this that were presented to us will insure that these experiments stay at the forefront of this important field, with important implications for environmental and energy science, as well as biology. The application of this technique to the pH dependence of the surface composition of aqueous ionic solutions and the ionic states of an amino acid in solution represent groundbreaking studies of this type.

- **In free-electron lasers (FELs),** this division has again demonstrated its pioneering spirit by already working on FEL experiments at FLASH in Hamburg and at LCLS in Stanford, and so is well positioned to move into this new era of VUV and soft X-ray science, including future work at the European source XFEL. The development of a magnetic bottle spectrometer for gas-phase studies will much enhance this work in the future, including studies of double-core hole states that have not been seen before, and for which they have obtained some first data using conventional time-of-flight spectrometers. Developing expertise for such research, for example, through special summer schools and a textbook is also a very positive development. The continued success of this activity could also lead to a high repetition FEL built close to Uppsala University.

- **The high-harmonic generation (HHG) source HELIOS** is also a very promising instrumentation development for high resolution time-resolved spectroscopy in the laboratory at the 50 fs timescale that is suited to the observation of various time-resolved phenomena, and can be used with the spectrometers mentioned above. It has potential applications to photon in-photon out measurements, liquids, dynamics of magnetism, energy related processes, and quantum beat phenomena. This team is at present awaiting the laser system’s delivery this summer, at which time it should start producing HHG which will then be used to carry out pump-probe experiments in the gas, liquid and solid phase using the different spectrometers mentioned above. This work is also a natural interface and complement to work at higher energies with free-electron laser sources. The development of HELIOS will be essential for studies at home in Uppsala, while preparing also for the more beamtime-intensive experiments at FELs, and also ultimately for the short pulse facility at MAX IV. The complexity of an HHG source also leads us to recommend that they hire at the postdoctoral level someone with prior expertise with such instrumentation.

- Looking ahead, **MAX IV** will become a major large facility for the use of the division, which is constructing four major beam lines; VERITAS (RIXS,
275 to 1500 eV), HIPPIE (high-pressure XPS, 263 to 2000 eV), SPF (ultrafast science, keV and fs), and ARPES (10 to 200 eV), and is strongly involved in all seven that are presently being planned. This will give the group a chance to implement new ideas into the design of beamlines and end stations and to continue its strong tradition of instrument innovations.

It is thus clear that this division will remain in a world-leading position in its fields as far as instrumentation is concerned in coming years. However, we have commented above on the need for this division to maintain sufficient support from the Ångström Mechanical Workshop in any merger of it with CAI and the associated expansion of the merged units’ responsibilities.

Furthermore, the rate of publication of this division, between 2007 and 2010, is about 58 articles per year published in various journals in physics and chemistry. Their published work includes three Physical Review Letters (one of the best physics journals), and many articles published in various other journals such as Chem. Phys. Lett., Phys. Rev. A, J. of Physics, and J. of Electron Spectroscopy. As judged by external research support compared to faculty support, the ratio of 1.57 in Fig. 2(d) indicates further that this is a very strong division within the department.

As an important action item of renewal over the next few years is to plan for the recruitment of several professors to replace up to four senior faculty members in this division who will be retiring. These people have been key to the establishment of this outstanding program, and creative and energetic replacements will be needed to maintain its momentum.

In what follows, we comment separately on the Molecular Physics and Condensed Matter Subdivisions, although there is a close connection and much synergy between them.

Molecular Physics Subdivision

General assessment of the unit
This is a diverse, well-recognized, sub-division whose efforts aim at investigating various aspects of structure and dynamics in molecules, liquids, and clusters. The scientists pursue their own independent funded research, and are as well involved in national and international collaborations.

Quality of research
We first note that there are various indicators of the top quality instrumentation development in this sub-department based on their presentations and publication record. Some of the research highlights include studies of doubly excited states in metastable helium atoms, energy correlation of the three electrons emitted during the triple photoionization of Ar and double core hole creation and subsequent Auger decay in NH₃ and CH₄ molecules. This group has
also been invited to present their work at national and international meetings. The research funding of the department also reflects the high-quality research pursued by the scientists. In addition to the traditional research areas using synchrotron radiation, two new directions have been launched: research with high-harmonic generation and FELs, as noted above.

**Research environment and infrastructure**

The organization of the subgroups within the AMO sub-division is well balanced and the infrastructure is adequate. We are concerned however, that there are not enough students and postdocs to take full advantage of the considerable future opportunities that have been discussed above. We strongly support adequate funding for this group. Such resources are important for maintaining the international standing of this group.

**Networks and collaborations**

We have commented above on the national and international (Italy, Japan, U.K., Germany, USA, France) collaborations in which members of this subgroup are involved. This is very positive, and we encourage its continuation, along with the pursuit of in-house individual research programs. We also note the successful synchrotron summer schools organized every year at Uppsala University. These activities are very important for the training of the next generation of scientists in this field.

**Opportunities for renewal and emerging science**

There is a strong, ongoing commitment to MAX-lab and to the planned MAX IV synchrotron facility. In fact, Uppsala University scientists are involved in the construction of four out of seven beamlines. There is also a strong ongoing effort to use XFEL. One junior scientist has shown strong leadership in international collaborations at such FELs.

**Effects of the KoF07-evaluation**

We were impressed by the implementation of the KoF07-evaluation at many levels and this sub-division is to be commended for its efforts in this.

**Actions for successful development**

We support the basic directions outlined to us, with novel instrumentation and facilities that will insure forefront scientific experiments. With regard to the proposed research with the HELIOS project, we have some concern that the members of the group do not appear to have direct experience with lasers as used for HHG, although they have visited such laser labs. In our opinion, in order for this project to be rapidly successful, it will be important to hire a staff scientist or postdoc with lasers and HHG background. This action will complement the present team which is very enthusiastically preparing the ground for this new research area for Uppsala University. We would like to caution the pre-
sent team that pitfalls can be numerous in establishing such a successful new research program and that working closely with scientists experienced in this field will insure a successful commissioning of the new HELIOS project direction.

We have already commented above on the need to plan for the replacement of several key faculty members due to retirement over the next few years. It is critical that these replacements be world-leading people.

Other issues
We were very impressed by the training given to all students at all levels and to postdocs. All students seemed very excited to be at Uppsala University and in particular as member of the Physics Department.

Condensed Matter Physics Subdivision

General assessment of the unit
Beyond being critically involved in the advanced instrumentation developments for electron and photon spectroscopy described above, this group has applied XES, RIXS, and XPS to various systems including magnetic semiconductors; surfaces in liquid environments, including metal films and clusters in aqueous solutions; and strongly correlated materials. These are cutting-edge systems of interest in high technology, energy research, and environmental science. This is clearly a world-wide leading and well-recognized group, studying solids, surfaces, interfaces, and nanoscale ensembles. The results may lead to future technological materials and devices, including energy-related phenomena based on new materials such as graphene and topological insulators. Scientists in this subdivision have also carried out groundbreaking work with the newly developed dimension of photoelectron spectroscopy that involves excitation with hard X-rays going up to 6 keV, in particular using BESSY in Berlin for such measurements. Such measurements have permitted studying buried interfaces in spintronic multilayer structures, deep core-level satellite structures, and changes in valence-band densities of states in complex materials with depth.

Quality of research
We would rate this sub-division overall as world leading, and we look forward in the coming years to more high-profile papers that make use of the superb instrumentation that they have developed for their spectroscopic experiments.

Research environment and infrastructure
The research environment appears to be excellent, and the infrastructure also very strong. However, see comments above concerning continuing access to the Ångström Mechanical Workshop.
Networks and collaborations
This group has excellent connections to other departments within Uppsala University, and is most international in its collaborations, with experiments going on not only at MAXlab, but at BESSY, the ALS in Berkeley, FLASH in Hamburg, and the LCLS at Stanford.

Opportunities for renewal and emerging science
We again stress the need to plan for the replacement of several key faculty members due to retirement. It is critical that these replacements be world-leading people.

Actions for successful development
Key in the next few years will be to begin to use the several new spectroscopic instruments for the most exciting science on surfaces, interfaces, and novel materials and nanostructures.

Effects of the KoF07-evaluation
The grouping of Molecular Physics and Condensed Matter Physics in this division as a result of the reorganization makes perfect sense.

Other issues
As in Molecular Physics, we were most impressed with the younger scientists who presented their work to us.

Division of Materials Physics

General assessment of the unit
The Materials Physics Division consists of 4 promoted professors, 4 associate professors, 5 postdocs, 2 researchers, 1 engineer, and 8 PhD students.

The panel has been impressed by the growth of this division since the last review. The number of researchers has strongly increased, valuable new instrumentation has been installed and brought into nearly full operation and a significant amount of research money has been won through grants to support an ambitious scientific goal: to explore the influence of confinement on the physical properties of materials. This is one of the grand challenges of nanoscience in general and the panel agrees that it is good to formulate such a vision for the future and then decide on the means and themes to address the forefront of this exciting field.

The three research themes presented were magnetism, hydrogen storage in solids, and soft matter. In magnetism, confinement was created through patterning and, although there are few papers yet published in high impact journals, the panel agrees that there are possibilities for real breakthroughs in this work.
Starting from dimensionality and confinement effects in delta-doped Pd(Fe) layers, this material was used to pattern magnetic structures onto a surface and study the effect of pattern structure and orientation in a systematic approach using magneto-optical methods.

The project to understand hydrogen diffusion has been started by studying its dependence on dimensionality in a thin layer. The idea is that the change of structure drives this diffusion. More quantitative research is needed to substantiate this hypothesis, with one interesting suggested option to study this change in real time.

The topics of interest in the soft matter research include adsorption and ordering of amphiphilic molecules on surfaces, with applications in water purification. The future directions of the division include the integration of magnetism and soft matter to investigate dynamics of magnetic liquids. Another planned future activity that was mentioned were pump-probe investigation of spin dynamics.

**Quality of research**
The panel has seen during the presentation and on its tour through the laboratories very good work with some excellent examples of research which can in due time lead to results with great international impact, but feels that it is too early to fully assess the research outcomes at this time. At this point, we would conclude that the work is beginning to be recognized internationally.

**Research environment and infrastructure**
The panel was impressed with the instrumentation that had been funded and at least partially put into operation since KoF07, and with the laboratories that are in a final stage of being established.

**Networks and collaborations**
There appear to be some good collaborations within the department (e.g., Materials Theory) and to some degree with international partners.

**Opportunities for renewal and emerging science**
These are largely discussed under Networks and Collaborations above, but we reemphasize the opportunities which will become available in the near future due to MAX IV, several FELs and the ESS. The panel suggests that early usage of existing facilities of this type will best prepare the group to exploit these new facilities and also assure that attaining the research goals of the group are best served by the suite of techniques that are or will be available at these facilities.

**Actions for successful development**
We would encourage in the future more interaction with the Condensed Matter Physics group so as to make optimum use of its unique spectroscopic tools.
One suggestion arising during the poster session was to use synchrotron radiation to study time-dependent phenomena in real time, something the panel fully supports. This will permit this division to take full advantage of the new scientific landscape in Sweden after the new facilities MAX IV (including its short bunch facility) and ESS will have started operation.

Effects of the KoF07-evaluation
We see very healthy development of this division since KoF07, and look forward to the next phase of fully realizing its full potential.

Other issues
The members of this division were highly enthusiastic and engaged. We were also impressed with the degree to which undergraduates and graduates from foreign countries are involved in this division.

Division of Materials Theory

General assessment of the unit
The Materials Theory Division consists of 1 chair, 2 promoted professors, 3 associate professors, 7 postdocs, 15 researchers, and 16 PhD students.

This division has a vigorous, versatile research and training activity in theoretical and computational condensed-matter and materials physics. It has established itself as a world-class activity, with an outstanding publication record in leading international journals. It is run by a dynamic group of senior scientists under visionary leadership, attracts excellent postdocs and students and fosters fruitful collaborations with experimental groups and industrial research. It has been successful in attracting competitive research grants both at the national and the European level. Building from the strong tradition of electronic-structure theory in Sweden, the division has expanded its expertise to cover new theoretical platforms and computational capabilities. It is forward-looking, with ambitious goals for both method development and applications in several important materials physics areas. As judged also by external research support compared to faculty support, with a ratio of 1.87 in Fig. 2(d), this is a very strong group within the department.

Quality of research
This division is among the world leaders in theoretical magnetism. First-principles computational methods are applied to a wide class of magnetic materials, ranging from metallic ferromagnets to diluted magnetic semiconductors and molecular magnets. The quantum-mechanical calculations are extended to spin dynamics to address collective spin-wave excitations. Multiscale modelling is developed and now includes mapping to Heisenberg models and to dynamics
described by the Landau-Lifshitz-Gilbert equations. This enables accurate investigations of phase diagrams on one hand and of complex, dynamical ordering phenomena on the other. Coupling also to micromagnetic simulations at the next level of coarse-graining opens up possibilities for simulations of magnetic phenomena at the device scale. New capabilities also include investigation of spin-polarized tunneling and imaging of magnetic structures on surfaces.

The division now also has a vigorous activity in strongly correlated materials, where methods beyond standard density-functional theory are necessary. The implementation of dynamical-mean-field theory (DMFT) within the first-principles context is among its core activities. Other methodological openings include time-dependent density-functional theory (TDDFT), Keldysh techniques for nonequilibrium transport and field theory methods for superconductivity and topological insulators.

The panel was presented a few examples of recent research projects: magnetism in f-electron materials, moments in Fe-based superconductors, interfaces between topological insulators and superconductors, imaging of surface Friedel oscillations, vacancy defects in graphene, magnetization dynamics, a number of activities in energy-relevant materials, and projects related to the prediction of phenomena at high pressures of interest in geology and geophysics. The expansion of transmission electron microscopy to include magnetic circular dichroism is also being developed in the division, and opens new possibilities for high-resolution measurements of atom-specific spin and orbital moments. There is also an interesting activity in computational screening of inorganic compounds and associated database building and data mining activities.

The research carried out in the division is consistently of high quality, topical and in many cases groundbreaking. The productivity in terms of publications and conference presentations is truly outstanding.

Research environment and infrastructure
The facilities in the Ångström Laboratory are excellent, and provide close proximity to relevant collaboration activities in experimental and theoretical physics, in chemistry and in engineering. The division has access to computational resources at UPPMAX and other nodes of the Swedish National Infrastructure for Scientific Computing (SNIC). It is important, however, that adequate local computing resources are secured for the division. This is exemplified by the rapidly emerging capabilities provided by graphics processing units (GPU), which offer cost-effective solutions for scientific computing at the research group level.

Networks and collaborations
The division has extensive national and international networks in place, and is actively engaged in several collaborations, with experimentalists, other theory groups, and with industry.
Opportunities for renewal and emerging science
Uppsala University has a strong tradition in electron and photon spectroscopy. The panel sees important opportunities in combining the strong expertise in electronic-structure theory methods present in the Materials Theory Division with experimental spectroscopy.

The panel also encourages the division to develop interfaces with researchers in soft matter and biological physics, although we at the same time caution against spreading itself too thinly over too many topics. Nonetheless, the state-of-the-art simulation capabilities offer great possibilities for providing crucial insight into structural dynamics and electronic processes in molecular and biological materials.

Sweden has made decisions of major investment in the large-scale facilities of MAX IV and ESS. This underlines the importance of harnessing the numerous exciting possibilities that state-of-the-art computational modelling and simulation can offer, both in terms of experiment and process design and in the interpretation and mining of complex experimental data, for example those emanating from various time-resolved spectroscopies and pump-probe experiments. We encourage the division to develop forward-looking initiatives in the context of interpreting and guiding future MAX IV experiments, in which Uppsala University scientists are much involved, as well as future ESS studies, depending upon the degree to Uppsala University experimentalists become involved in the latter, but of course always guided by being at the forefront of materials theory.

Actions for successful development
The division presently benefits strongly from the contributions of young faculty and researchers. It is very much in the university’s interest to secure their positions and to maintain the attractiveness of the division to talented researchers, including those coming from abroad. The division could also consider developing a stronger international visibility in education, for example by developing international Master’s programmes in materials theory and simulation.

Atomic-, molecular-, and unit cell-scale materials theory flourishes in the division. An important challenge for the division, similar to its counterparts in many countries, is to forge links to materials science at longer length and time scales, reaching eventually to macroscopic phenomena. The division is fully aware of this “multiscale” challenge, but could perhaps take it into consideration in future recruitments.

Effects of the KoF07-evaluation
The division has closely followed the KoF07 recommendations. The merger of the two theory groups to one division has been successfully executed. The division has initiated a multidisciplinary effort in graphene science, together with chemists and engineers. The competence base in many-body quantum physics and field theory is being improved through recent recruitments.
Other issues
The group size has now reached close to fifty researchers, enabled by the success in externally funded grant proposals. The panel feels that senior-level appointments should be considered for consolidating the research excellence, especially given the widening scope of research activities over a range of materials and phenomena.

We see a very positive development and excellent future prospects for this division. As stated in the KoF07 report, it is comprised of an excellent group of theorists at all levels. The very close coupling between experiment and cutting-edge theory is used to interpret data or suggest new experimental directions. These theoretical developments span the interpretation of atomic, molecular, surface, and solid-state spectra, and the understanding of various effects in magnetism and strongly correlated materials, including a range of topics from very fundamental to more applied.

We again found this division to be populated with a most talented and enthusiastic group of scientists, at all levels.

Division of Physics Education Research
[Also evaluated by the Educational Sciences panel, see page 142.]

General assessment of the unit
The Physics Education Division is a smaller effort consisting of 1 chair, no promoted professors, 3 associate professors, no postdocs, 1 research fellow, 1 research assistant, and 3 PhD students.

This division is about ten years old and has a unique research focus in Sweden. The future vision of the members of this group is to use “complexity thinking to model emergence as a factor in physics learning, student retention and social academic network”. They aim at investigating links between multimodality and the attainment of disciplinary literacy in physics. They also plan to investigate the role of interactive social media in learning physics. They are also well funded for their research, which is in general more theoretically oriented toward the university-instruction level.

Quality of research
The members of this panel are not experts in research education, but one of us has been involved directly in classroom testing and evaluation of new modalities for teaching physics, and the department of another has been actively involved in applying these ideas for a number of years. Beyond this expertise, we cannot comment on the intrinsic quality of the research conducted by the group, but we note that it has also been reviewed by panel 3 (Sociology, Educational Sciences), which is very positive concerning its activities. Although there are a number of publications, and they appear to represent a unique effort in
Sweden, the panel is not in a position to comment on the journals in which the research is published. Again, panel 3 is positive on this aspect.

**Research environment and infrastructure**
The group seemed to indicate that their number is adequate and that they have a good successor to the present leader of the group, whose replacement due to retirement is a key issue for the future.

**Networks and collaborations**
The group appears to have reasonable international collaborations and interactions. But it was nonetheless not clear to us that they are fully aware of the details of similar physics education research and its classroom testing as carried out in other countries. We recommend that they establish more of such collaborations in order to broaden their views of physics education research, in particular in its more applied forms that can be evaluated in the science laboratory or classroom.

**Opportunities for renewal and emerging science**
We suggest that this group would have a greater impact if their theoretical ideas could be more applied and tested in the classroom, at Uppsala University or at other universities in Sweden, since they are the only research group in physics education in the country. Making greater connection with education specialists at Uppsala University is also recommended, and is supported as well by panel 3.

**Effects of the KoF07-evaluation**
They have published several papers but the impact of these papers at the national or the international level is not clear to this panel. However, we again refer to the evaluation of panel 3, which in fact is positive on this point.

**Actions for successful development**
This group’s research tends to be very theoretical, which is to be sure one aspect of education research (especially in physics!), but it would improve its impact and its connections to many other international physics education research groups if it became more involved in applying the results of its analyses to teaching in the other divisions within the Physics Department, as well as to real educational situations, so as to test the validity of its analyses. This also leads us to question whether it is necessary for this group to be a division solely within the Physics Department and not, for example, somehow more closely linked also to the Department of Education at the university. As noted above, this division has also been reviewed by panel 3, and we note that they also have recommended a closer connection to the education science specialists at Uppsala University. A final question that can be asked is whether more theoretical research similar to theirs is carried out in other disciplines at Uppsala University; if this is the case, joint activities like regular seminars would be a good thing to arrange.
Other issues
The panel found all of the members of this group to be enthusiastic about their program.
Panel 14

Scope of the panel’s evaluation:
Department of Biochemistry and Organic Chemistry
Department of Physical and Analytical Chemistry
Department of Photo Chemistry and Molecular Science
Department of Materials Chemistry

Introduction
Science is the foundation of technology that drives much of the contemporary economy, the wellbeing of nations and their citizens. Chemistry is key among the sciences because it underpins most of the other sciences and many current concerns such as energy supplies, climate change, life science and medical issues, sustainability and the environment.

Chemistry at Uppsala University is world class with an international reputation and the wherewithal to address these societal issues. We commend Chemistry at Uppsala for their strategic thinking and their initiative to reorganize from four departments into two, at present, on the way to becoming a single department. The panel was surprised and dismayed that, given its KoF07 evaluation and high ranking, Chemistry was not given a larger share of the resources subsequently distributed.

Chemistry at Uppsala University has an excellent and enviable age distribution as a consequence of recent hirings and promotions, some of which were facilitated by KoF07. We commend the young faculty, who are at the forefront of developing the Junior Faculty initiative, which is essential for the future development of science in Sweden. We strongly encourage the University and Faculty management at Uppsala University to support this outstanding initiative.

As laid out in the terms of reference, panel 14 undertook a careful, detailed, critical and objective evaluation of the chemistry programs. The panel was impressed with the overall quality of the programs and their impact on the physical and life sciences despite the fact that some are only recently established or in a state of flux. In our judgment, the quality of the programs ranges from internationally recognized to top-quality, as detailed below in the individual descriptions.

Summary and recommendations
As described below, all chemistry programs are highly meritorious, internationally recognized and some are world leaders. Others have the potential to become world leaders given time and resources. For some programs, however, additional resources are critical in the near future for them to ensure their competitive edge, while some other programs will require more resources in the longer term. Additional resources would even further enhance the internationality and facilitate interactions between science, engineering and medi-
cine and their impact on societal challenges. Successful reorganization demands that all of Chemistry realize and emphasize their common identity as a united and single entity. Chemistry is a core discipline and some of the current programs need to strengthen their interactions with each other; in some programs there is room for additional external collaborations. There are areas the panel would particularly encourage more internal collaboration, for example, we feel it would be very beneficial if the various modelling and simulation groups presently scattered between different programs create a virtual center of modelling and simulation, as recommended in KoF07.

The panel was particularly pleased to see the success of the international M.Sc. program in Chemistry recommended in KoF07. The number of students starting this program has increased from 12 (1 from Sweden) in 2007 to 47 (4 from Sweden) in 2010. The success of this program will be a key factor in the successful development of Chemistry. The recent decision of the Swedish Government to charge fees to foreign students in such degree programs is a direct threat to the continuation of this success. The panel strongly supports the measures, such as stipendia, that are being considered by the university to ease this problem.

The Chemistry Section has identified four strategic areas: Chemistry for Life Science, Chemistry for Renewable Energy and Storage, Sustainable Development, and Large-Scale Facilities. All of these feature significantly in several of the Chemistry programs. They also fit well as important cross-cutting themes within the university priority areas of Life Science, Energy and Materials. The anticipated developments and innovations that result from these programs should be instrumental in helping the university maintain and further develop its position as a leading international center in chemistry.

Department of Biochemistry and Organic Chemistry

Synthetic Organic Chemistry

*General assessment of the unit*

Currently situated in the Department of Biochemistry and Organic Chemistry, the Synthetic Organic Chemistry Program is partially centered around methodological questions concerning enantioselective reductions using Pd catalysts and asymmetric catalysis in general, and partially on the synthesis of specific classes of compounds such as antioxidants, peptidomimetics, kinase inhibitors and artificial ion channels. Synthesis lies at the very core of chemistry and is of extreme importance, as many ideas throughout chemistry can only be materialized through collaboration with a synthetic organic chemistry group. Given the profound knowledge represented by the members of the program, a more pro-
nounced coordination or collaboration of/with the organic synthetic chemists in phenomenologically oriented programs would be beneficial.

**Quality of research**
Enantioselective reduction catalysis is still a hot topic in synthetic organic chemistry. The work presented in this field is excellent. The use of renewable carbon sources represents a current trend in organic chemistry, but it is difficult to judge its importance for the organic synthetic group at Uppsala University. There is some excellent research in this program. Overall, the panel found the research presented in the program to be internationally recognized.

**Research environment and infrastructure**
The Synthetic Organic Chemistry Program consists of three Professors and two Assistant Professors. The additional Assistant Professor triggered by the KoF07 report is very beneficial for the impact of synthetic organic chemistry. The panel strongly supports the idea that the Synthetic Organic Chemistry Program should seek more extensive collaborations with other chemistry groups at Uppsala University in addition to pursuing their own principal research area. The know-how of the researchers is also reflected by the corresponding graduate research courses. The infrastructure is adequate, but a substantial investment into the NMR spectroscopy must be envisaged in the near future in order to guarantee continuation of the high quality work.

**Networks and collaborations**
Many collaborations involving members of the program have developed in the last few years, e.g., N-INNER (“Fuels from Biomass”), NordForsk (“Excellent Nordic Chemistry”), and COST D40.

**Opportunities for renewal and emerging science**
The field of “green chemistry” or “sustainable chemistry” has been declared by the Faculty of Science and Technology to be one of four important strategic targets. It also features in the profile of the Organic Chemistry Program of the Department of Biochemistry and Organic Chemistry. The use of catalysts in organic synthesis (enantioselective catalysis), or of glucose as a carbon source can be judged “green chemistry” in a broad sense, but the panel could not identify “green chemistry” as a major constituent of the current research activity.

Nevertheless, the program has recently been active in coordinating and/or participating in Fuels from Biomass (2010) and NordForsk (2010).

**Actions for successful development**
None.

**Effects of the KoF07-evaluation**
The evaluation allowed the hiring of a new Assistant Professor.
Physical Organic Chemistry

General assessment of the unit
Physical organic chemistry at Uppsala encompasses a diverse set of activities that includes molecular recognition and catalysis, functionalization of hard materials, isotope effects, computational chemistry, molecular electronics and PET chemistry. The program is well established and well integrated in the Department of Biochemistry and Organic Chemistry. The use of guest professors has been especially beneficial for some of the research in this program.

Quality of research
The quality of the program as a whole ranges from internationally recognized to internationally high standard.

Research environment and infrastructure
The research environment is good but there is a great need to improve some major instrumentation, in particular NMR (as also pointed out by members of the synthetic program and the students).

Networks and collaborations
This group has established an extensive network and collaborations such as U3MEC, Uppsala Graphene Initiative, Uppsala Berzelii Technology Center for Neurodiagnostics, Center for Biomimetic Sensor Science NTU, Singapore, IMAGINT, SciLife, and with a Frauenhofer Institute. It has also generated the spin-offs ModPro AB and Blox AB.

Opportunities for renewal and emerging science
The molecular recognition part of the program is novel and potentially could have a very significant impact. Further development of radio-labeling and PET imaging is encouraged.

Actions for successful development
Better access to the medical imaging facilities and more optimal organization of the preclinical imaging lab at Uppsala University would greatly facilitate the development of in vivo applications of the molecular concept program. The successful recruitment of two young scientists, one in PET chemistry and one in chemical biology is important.

Effects of the KoF07-evaluation
The establishment of a graphene center at Uppsala University is a result of the KoF07 evaluation.

Other issues
To maintain the continuity and viability of this program it would be desirable to
provide bridge funding until funds from the retirement of the current Professor become available

**Biochemistry**

**General assessment of the unit**
The major foci of the biochemistry program are in molecular recognition and catalysis. These are particularly chemical aspects of biochemistry and are highly relevant for drug discovery, clinical diagnostics, medicine, biotechnology and sustainable development. The program is well established and has led to the set up of two spin-off companies, whose personnel interact with the researchers at the university. There is nevertheless a serious problem as the two senior personnel have considerable teaching loads, largely because they are both promoted professors, and there are minimal staff below them who could both lighten this load and provide important support for PhD students. The panel considers that a solution to this problem needs to be sought urgently. The panel felt that the program was well placed under the umbrella of chemistry, as the research areas were strongly chemical, and more biologically orientated areas of biochemistry exist at some biological departments (ICM, IMBIM, FarmBio).

**Quality of research**
The research presented indicated that this program ranged from internationally recognized to internationally high standard.

**Research environment and infrastructure**
The environment within the program and in turn within the department is good.

**Networks and collaborations**
There are excellent international collaborations and networks with the program, with a large number within Europe (Universities in Spain, Italy, Germany, Belgium, Norway, and the Netherlands). There are two spin-off companies: Beactica AB and ViperaTech AB.

**Opportunities for renewal and emerging science**
The research in the biochemistry program has tremendous potential for understanding a wide range of molecular interactions. In particular the surface plasmon resonance studies are probably the most advanced and comprehensive in Europe, and possibly the world. This is becoming increasingly relevant as more proteins are cloned, and understanding how they interact with other molecules will be the next major step after understanding their structures.
**Actions for successful development**

The panel believes that significant support needs to be provided to the biochemistry program for it to survive. It is clearly at a sub-critical level, with many demands on the two professors.

**Effects of the KoF07-evaluation**

This had very little effect. At the time of KoF07 one of the professors was known to be approaching retirement, but has not been replaced, leaving the remaining promoted professors to shoulder both the research program and the teaching.

**Other issues**

Despite any administrative concerns, including budget deficits, it is of paramount importance that the open Chair of Biochemistry be filled as soon as possible.

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**Department of Physical and Analytical Chemistry**

**Analytical Chemistry**

**General assessment of the unit**

Analytical chemistry is one of three programs within the Department of Analytical and Physical chemistry with analytical chemistry situated in the BMC and the two others (Physical Chemistry and Theoretical Chemistry) in the Ångström laboratory. The Chemistry section is currently under reorganization and will go from four to two departments, in which analytical chemistry will be part of the same department as Biochemistry, Physical Organic and Synthetic Organic Chemistry.

After the departure of the previous chair of the Analytical Chemistry program, the position was vacant until 2010 when, already acting head of program and department, Professor Jonas Bergquist was appointed full chair. The research of Analytical Chemistry in Uppsala is outstanding in Sweden and clearly also conducted at a very high international level. The focus is on separation sciences and in particular bio-analytical mass spectrometry (MS) for life-science applications. Both fundamental and applied research is pursued; however, the main driving force appears to be the development of enabling analytical methodology to solve fundamental problems in life science, e.g., the search for peptide and protein biomarkers relevant to Alzheimer’s disease and chronic pain, and trace metal analysis in biological fluids relevant to cancer treatment. The strength of the program is that it is truly translational in nature, conducted in very close collaboration with the clinics. The research spans from analytical method development in sampling, sample handling, separation, detection, multivariate data analysis and verification and validation using conformational techniques to clinical...
applications that involves critical sampling from patients, e.g., brain tissue and human cerebrospinal fluid (CSF), and surveillance of patient health over time.

**Quality of research**
The quality of research of this program is excellent, especially in relation to clinical applications of bio-analytical mass spectrometry, in some aspects even world leading, referring to the establishment of the proteome of normal human cerebrospinal fluid (CSF). Currently they are seeking to unravel the metabolome of human CSF, which if successfully achieved, most likely will make the program world leader in the field. In the language of the KoF11 *Terms of Reference*, the panel rated this program as of internationally high standard.

**Research environment and infrastructure**
The research environment of the program is excellent with access to state-of-the-art analytical instrumentation in separation science (liquid chromatography, capillary electrophoresis, 1D and 2D gel electrophoresis) and detection (a variety of mass spectrometric methods as well as spectroscopic, electrochemical and immunological methods) for high level research as well as instrumentation for education and hands on exploration.

**Networks and collaborations**
The level of interaction of this program is impressive, with a leading role in the *Uppsala Berzelii Technology Center for Neurodiagnostics*, which is an interdisciplinary collaboration between the Faculty of Science and Technology, Faculty of Medicine, Uppsala Academic Hospital and some major Biotech and Pharma companies in the region. Moreover, the program is responsible for the protein characterization platform of the newly initiated *SciLifeLab-Uppsala*, which is a direct initiative financed by the Swedish Government. Other examples of interdisciplinary collaborations involve the exploration of high-value compounds from agricultural and forestry waste by sustainable methods with Lund and Karlstad Universities, and the determination of Pt in nanoparticles used for cancer treatment with the Karolinska Institutet. Important international collaborations concerning characterization of SPF are research groups and hospitals in the U.S. (Departments of Medicine and Neurology at the New Jersey Medical School, Biological Sciences Division, Pacific Northwest National Laboratory in Richland Washington, and Department of Neurology, State University of New York-Stony Brook).

Professor Bergquist was recently appointed Adjunct Professor, Department of Pathology at Utah University.

**Opportunities for renewal and emerging science**
It is a little unclear what the *SciLifeLab-Uppsala* government initiative will lead to for the program. However, hopefully it can lead to a renewal of the present aging instrument park.
The panel believes that the program would benefit from a more intimate collaboration with the Engineering and Materials Science programs at Uppsala University, possibly also with KTH and SciLifeLab-Stockholm to explore the new and exciting possibilities for the analytical sciences that are emerging in the area of micro and nanotechnology.

**Actions for successful development**

The panel believes that it will be of utmost importance that the Faculty of Science and Technology finds novel routes to support and renew the instrument park at the analytical chemistry program. This is said in light of the fact that the possibilities for applying for funding of larger infrastructure have apparently been reduced in Sweden. It is, however, vital that this problem is solved without making the program a mere service function unit for possibly paying users or clients. It is important to find a balance between research and service functions.

**Effects of the KoF07-evaluation**

At the time of KoF07 the chair was still vacant and the recommendation was that it be filled as soon as possible to create a more focused and secure environment. The chair was finally filled in 2010. However, it is not evident that this was a result of KoF07. Other than that, nothing seems to have happened in spite of the very favourable evaluation.

**Other issues**

The environment within the analytical chemistry program clearly offers high quality fostering and supervision of undergraduate and graduate students, reflected by the number of students from the program that have been awarded the Phabian prize for best Swedish PhD thesis by the Swedish Academy for Pharmaceutical Science.

**Physical Chemistry**

The work in the Physical Chemistry program is split between two campuses and also into two distinct areas, although they are linked by a common theme: the structure function and properties of interfaces of materials. The Ångström group concentrates on dye-sensitized solar cells (DSSCs) and the BMC group on “soft” interfaces.

**General assessment of the unit**

The more prominent of the two areas in Physical Chemistry is the research on dye-sensitized solar cells; the research being carried out here represents some of the best work being done in this area anywhere in the world. It is a significant achievement for the university to have attracted this group to Uppsala.
Quality of research
There can be no doubt that the research on dye-sensitized solar cells (DSSCs) represents work at the very highest level. Having been involved in this field since its inception in 1991, the group at Uppsala holds its place at the forefront of research in this extremely important and continually expanding area. Many significant breakthroughs in DSSC research are rightfully attributed to this research team, previously located in Stockholm but continued since their recent move back to Uppsala. A particularly exciting result was conveyed to the panel during the visit, in which a cell design motivated by work from this group has resulted in a world-record efficiency of 12.3% for a dye-sensitized solar cell. In short, this team has few, if any peers in terms of its expertise in the study and understanding of the operational characteristics of DSSCs. In addition, there is a significant practical component to the research that has resulted in the creation of a spin-off company. This provides students and postdocs in this group with a unique view of how basic research can translate into practical applications. The soft interface group is also performing novel and important work, so that the panel rated the program as top-quality overall.

The work on ‘soft’ interfaces to control physical and chemical processes includes the structure, dynamics and behavior in lipid surfactant systems and model membranes, but the KoF11 presentation to the panel centered on lipid-based nanoparticles for drug delivery. This was deemed to be novel and exciting. Liposomes linked to PEG can be used to carry specific molecules to specific locations in the body. This work clearly has considerable therapeutic potential, as many molecules and many targets could be envisaged for future work. This work has already led to publications and is a strong part of the program.

The Computational Physical Chemistry group has been weakened by the departure of Malek Khan and by a very heavy teaching and administrative burden. Nevertheless, novel sampling techniques have been developed for Monte-Carlo simulations of polymers.

Research environment and infrastructure
The basic infrastructure available in both the Ångström Labs and BMC seems adequate for the goals of the research teams. The DSSC-group is taking full advantage of what has already been put in place by the groups working on artificial photosynthesis. This synergy in the use of instrumentation and facilities is a strong argument for merging the DSSC-group with Chemical Physics.

As a whole, the Physical Chemistry program in its current form is fragmented, both in its research directions and by the separation over two sites. This has been recognized and plans to integrate the DSSC group with Chemical Physics are quite far advanced. The panel welcomes these plans as an important step towards optimizing the use of infrastructure and maximizing scientific contacts between groups that are important for the future of Chemistry at Uppsala University. This merger also provides the opportunity to integrate the soft-interface and computational physical chemistry groups into programs where they will
enjoy more common scientific interests than in the current Physical Chemistry program.

**Networks and collaborations**
The DSSC-research program is very much plugged in to the community at large: all research teams in the world working in this area are familiar with reports coming out of this group. The team is very interactive and highly sought after at international meetings. The soft-interface group works actively with partners in Europe and Canada and appears to be well networked.

**Opportunities for renewal and emerging science**
The DSSC-group is already pursuing a number of new themes and taking advantage of larger infrastructures such as the synchrotron in Lund to carry out advanced X-ray spectroscopic studies.

**Actions for successful development**
The panel recognizes, as do the research teams, the obvious synergy that exists between the solar cell research in the Physical Chemistry program and the work being carried out elsewhere in Chemical Physics. A formal merging of these efforts represents a natural and desirable progression, and the panel strongly urges that this merger be given high priority; it should be possible to do this while allowing each of the teams to retain their own distinct identities. There also appears to be the need for additional personnel: this kind of support is strongly encouraged.

This proposed merger also offers the opportunity to strengthen the connection of the Biophysical Chemistry (soft-interface) group with the Department of Biochemistry and Organic Chemistry in BMC and at the same time to make better use of their expertise in the general context of drug design and delivery. The isolation of the Computational Physical Chemistry group should be considered in the context of a further-reaching solution to the problem of the dispersed competence in Modelling and simulation in Uppsala.

**Effects of the KoF07-evaluation**
Since the DSSC-group matriculated at Uppsala after the KoF07 evaluation, there is nothing to compare to along these lines. That being said, the panel strongly recommends that the efforts of this group be supported in meaningful and substantive ways. The KoF07-evaluation suggested that the biophysical chemistry group might be better associated with another program. This now appears to be probable as a consequence of the planned merger of the DSSC-group with FOTOMOL.

**Other issues**
The spin-off company that has been initiated in connection with solar energy research in Physical Chemistry represents an excellent opportunity for the re-
searchers involved, as well as providing good visibility for Uppsala University in general.

**Theoretical Chemistry**

The program of Theoretical Chemistry corresponds to the old Quantum Chemistry program. The new chair, Professor Lindh, was appointed approximately one year ago, so that the program is still developing its character and direction.

**General assessment of the unit**

The program of Theoretical Chemistry has made significant progress since the appointment of Professor Lindh, who clearly has a vision for the program as a whole and has already forged the group into a more integrated unit than was previously the case. Two young researchers have been recruited to cover the important aspects of applied quantum chemistry and development of multi-reference wavefunction-based methods for large systems. The existing members of the program at the time of Professor Lindh’s appointment, Professors Froehlich, Karlsson and Sjöqvist, have been integrated into the program far more closely and the group as a whole is advancing towards becoming a leading think-tank for quantum chemistry beyond density-functional theory (DFT), which dominates current quantum chemistry. This is a fitting continuation of the Uppsala tradition. A clear strategy for developing the program is recognizable with a strong emphasis on complementary types of quantum theory, recruitment of young researchers for key areas and well-defined research challenges.

**Quality of research**

As a whole, the program can now be rated internationally recognized, but is already demonstrating the potential to improve this rating considerably in the near future. The established research within the program is of a high standard and the new projects show promise. The integration of Professor Karlsson into the MolCAS community and the general air of cooperation within the program suggest that a fruitful research climate has been established. The goals that have been set are ambitious and would have a major impact on modern quantum chemistry if achieved. The group is one of the very few in the world that have persisted with wavefunction-based theory in the face of the dominance of DFT. This could turn out to be a very good decision, but in any case guarantees an internationally-visible niche position for the program. The current concentration on developing methods is understandable as a viable strategy at this stage of the program’s development.

**Research environment and infrastructure**

The group uses supercomputer facilities whenever necessary and appears to have adequate computing facilities. Additional facilities may become necessary
when the new methods become available and applications become more important. Quite generally, Sweden’s central supercomputer facilities currently lag behind local clusters installed in many European and American universities.

 Networks and collaborations
The international MolCAS user community provides the group with visibility and a preexisting network. The number of groups that work on multi-reference methods worldwide is quite small, and the Theoretical Chemistry program in Uppsala can easily play a leading role, especially when the new methods become available.

Perhaps because of the youth of the program, its networking within Chemistry in Uppsala is not well developed. As noted in KoF07, many groups work in the general area of theory, modelling and simulation in Uppsala. The Theoretical Chemistry program can potentially play a lead role in networking these activities, which are strongly fragmented.

 Opportunities for renewal and emerging science
The worldwide theoretical chemistry community is split between the DFT and wavefunction-based communities. Of the three major theoretical directions: DFT, single-reference wavefunction-based techniques and the multi-reference techniques, the latter are the most universally applicable, but also the most difficult to use, so that they are less suitable for widespread use. The Uppsala group plays a prominent role among the three or four groups worldwide developing such techniques.

 Actions for successful development
At this early stage of the renewal of the program, concentrating on developing the methods needed to be able to treat topics that arise, for instance in the FOTOMOL program, is a sensible strategy. As the new methods become available, it will be important that the Theoretical Chemistry program becomes increasingly involved in collaborative projects with the experimental programs and other modelling and simulation groups in Uppsala.

 Effects of the KoF07-evaluation
The major recommendations of KoF07 were that a strong leader be hired from outside Uppsala and that Theoretical Chemistry should be positioned as a center for the scattered modelling and simulation activities in Uppsala. The relatively long delay in appointing a new professor has meant that the program is still at an early stage in its renewal process, but a clear strategy has been implemented.

The second recommendation that a virtual Center for Modelling and Simulation should be formed to bundle and coordinate modelling within Chemistry has not been implemented. This omission means that important technical, financial and intellectual synergies are being missed.
Other issues
The Theoretical Chemistry program will not realize its full potential for several years as it is still at an early stage in its planned development.

Department of Photochemistry and Molecular Science

The Department of Photochemistry and Molecular Science was created in 2006 and represents the combined efforts of a multidisciplinary set of research teams. The overriding goal is reflected in the original vision of the Center for Artificial Photosynthesis (CAP), namely the development of systems, both artificial and biologically-derived, that will enable direct fuel production from sunlight targeting mainly hydrogen technology. Since the creation of this consortium, the various research teams have expanded in breadth and depth to produce a research program that is at the forefront of efforts worldwide in the very important area of solar energy conversion.

The Department houses two programs, Chemical Physics and Molecular Biomimetics, which also includes Microbial Chemistry. As there is an extremely close collaboration between the two programs, they will be dealt with together in this evaluation.

General assessment of the department
The department has been able to assemble a remarkably diverse yet well-integrated team spanning expertise in chemical physics, biophysics, molecular science, spectroscopy, biology, and chemical synthesis; all of these efforts have a synergy that is seldom realized under one roof. It is clear that all members of this research team are playing an integral role in the overall success of the unit. The primary focus is on the creation of Solar Fuels, a topic of vital and growing interest. This is a complex problem that requires the marshalling of a wide range of expertise, all operating in concert toward a common vision. It is clear that over the past five years this program has made substantial and significant strides toward this goal. Indeed, the program represents the standard against which many efforts around the world are either directly or indirectly compared (in the United States, for example, several Energy Frontier Research Centers as well as the Solar Fuels Hub from the Department of Energy can be viewed as being modeled after the Consortium from which this program was created). The Biomimetics program has a long-standing record of high-class research in the field of photosynthesis research with emphasis on understanding the chemistry in Photosystem II. This in turn is the basis for constructing the compounds from which an artificial system can be built. Microbial Chemistry has been part
of the Molecular Biomimetics program since 2008 and has added the required biological dimension to the program and its applications. The group is studying cyanobacteria to be used for hydrogen production and the output has been of top quality. The programs as a whole have a good gender balance.

**Quality of research**

The panel was unanimous in its assessment of the programs as together representing the pinnacle of this area of science; in the language of the KoF11 Terms of Reference, the panel rated them as top-quality overall. We do not wish to single out specific individuals, but it is fair to say that a significant fraction of the people involved in this effort represent the very best in the field. The research is routinely published in the top journals (e.g., *Journal of the American Chemical Society*, *Angewandte Chemie*, etc.). The quality and discipline-wide appreciation of the science being conducted is reflected in the large number of invited talks and international conference leadership roles that have been realized since KoF07. The artificial systems have evolved in sophistication over the past several years and now include viable routes for electron transfer processes to iron-based clusters for the production of H₂. There is an impressive integration of biology at the molecular level, synthesis, spectroscopy, and, to a lesser degree, materials science in a number of efforts within the programs. The SOLAR-H₂ portion of the programs has likewise developed considerably over the past several years. In Microbial Chemistry focus is on the use of cyanobacteria as model organisms for hydrogen production, but has also directed interest towards biological production of other biofuel alternatives. The research overall is of top quality and has addressed not only molecular issues but also the fundamentals of future applications. This synergy between the biological and artificial aspects of energy science is already bearing fruit and is an extremely promising enterprise for future development.

**Research environment and infrastructure**

The placement of the programs within the same department in the Ångström Laboratories in 2006 has clearly fostered excellent and highly productive interactions among the various research groups. The facilities are superb and appear to be sufficient to allow the research to continue developing along its current high trajectory. The environment within the department is definitely beneficial to all parties: there are clear cross-fertilizations between the chemistry-intensive aspects of the research program and the more biological projects, making for a truly integrated interdisciplinary environment. As will be mentioned below, one area that the panel feels needs further support is on the synthetic side of the biomimetics effort.

**Networks and collaborations**

The level of interaction exhibited by this program is impressive. There is without question a strong international flavor to the program as a whole, with stu-
dents, postdocs, researchers, and professors representing a broad cross-section of the international scientific community. A particularly striking aspect of the program is the extent to which this group has endeavored to bring in rotations of individuals from various groups for multi-month periods. Microbial Chemistry has already reached a high degree of international visibility and participates in a number of international collaborations and networks.

Opportunities for renewal and emerging science

The panel noted several opportunities that the programs could take advantage of given sufficient support. For example, the development of MAX-IV in Lund could allow for the pursuit of studies in time-resolved X-ray absorption spectroscopy that would position this research to compete with other world leaders in this emerging area (e.g., the ANSER Center at Northwestern University and Argonne National Laboratory). In addition, given the nature of the field in which the programs are positioned, more extensive interactions in the area of materials science might add a new dimension to the efforts (the possible integration of the Physical Chemistry program, as described below, would be a good step in this direction). Microbial Chemistry is still a rather new addition; it would seem that the present directions of research should be continued. Using the tools developed, focus on establishing a cyanobacterium with high efficiency in hydrogen production should be given priority.

Actions for successful development

The panel believes that significant additional baseline support for the programs is critical to maintain the current position at the forefront of the exceedingly important area of energy science. As one specific example of the general situation, it is strongly recommended that the university provides the necessary means to ensure that Dr. Sascha Ott is offered permanent status at the university. This comment extends in general to the synthetic efforts within the programs; it is the panels’ assessment that further development is resource-limited and efforts should be made to augment the current support structure rather than build up biomimetics at the expense of current, highly successful efforts in other aspects of the program. The work by Professor Hagfeldt in Physical Chemistry, itself a world-class program, is well-suited for integration into these programs and the panel encourages this integration. The common principles (e.g., photo-induced charge separation) are clear, and the integration will allow the exchange of ideas, materials, etc. on a more routine basis. The panel views this planned combination as an excellent idea for both its scientific value and for the added visibility that formalizing this interaction will achieve. Microbial Chemistry has presently suboptimal financial support for permanent staff. It is of central importance for this kind of high-risk project that the internal support is high enough to allow long-term development of the projects.
Effects of the KoF07-evaluation
The panel was unanimous in its concern that the very positive assessment given by the KoF07 evaluation did not translate into a significant investment in this program. While it was noted that several line items were initiated (e.g., funds for support of Professor Lindblad’s efforts), the level of support did not appear commensurate with the degree of excellence exemplified by this program. It should be noted that the program still went ahead with implementing many of the recommendations of the KoF07 panel; for example, the restructuring in a way that more reasonably reflects the research directions of the programs, despite not being afforded significant support as a result of the KoF07 report. The panel strongly recommends that this situation be addressed in response to the current evaluation.

Other issues
The environment within Microbial Chemistry offers exciting projects for students doing Masters degree projects as well as for PhD theses. It is however central that sufficient staff is financed to offer high-class supervision. Overall, the area of science represented by the research teams within the programs is clearly one of significant societal importance and should be strongly supported.

Department of Materials Chemistry

Inorganic Chemistry

General assessment of the unit
The Inorganic chemistry group has very recently acquired new leadership and is in the process of reassessing its aims, priorities and strategies. Inorganic chemistry has a long tradition in Uppsala, but nevertheless, is undergoing a process of renewal with a significant number of new, young staff members, giving this large group a good distribution of senior and junior staff and student numbers. The research focus is on energy-related materials, which is one of the Faculty’s and university’s strategic priority areas; it has a strong synthesis program on a broad range of carbon-based materials and composites, which includes novel carbides, graphene and related topics of high fashion. The carbides work has attracted significant industrial interest and the synthesis programs involve collaborations with other groups in energy-related topics such as lithium batteries, hydrogen storage, Grätzel cells and nano-structured materials for photo-catalysis.

Quality of research
The output is already internationally recognized.
Research environment and infrastructure
As expected, synthesis of inorganic materials lies at the core of this program and the group has an appropriate and extensive range of synthesis techniques and facilities available. Interactions with the cognate Structural Chemistry program within the department should be very beneficial through shared and complementary expertise.

Networks and collaborations
New materials are usually synthesized with a target property in mind. The group collaborates widely with others in the Faculty and externally with industries that have a particular materials need.

Opportunities for renewal and emerging science
In its strategy, the department wishes to retain core competences in synthetic inorganic chemistry. It recognizes an important need to acquire competence in, and gain improved access to, high quality transmission electron microscopy facilities, which are a key component of structural studies on new inorganic materials. Occasional access to facilities elsewhere, or through collaboration with other groups, is unlikely to be able to meet the needs of this expanding synthesis program. A new project on combinatorial materials science is planned as a means to map compound formation in ternary systems rapidly and, in principle, target compositions for subsequent in-depth studies of materials with enhanced or interesting properties.

In recognition of the importance of access to large scale facilities for materials characterization, a new appointment in this area has been made.

Actions for successful development
Both this program and the Structural Chemistry program highlighted the need for improved equipment and competence in TEM. Given the existing strong expertise of the programs in diffraction techniques, their growing involvement in use of large-scale facilities and the complementary nature of TEM, the case for investment in this area is very strong and, indeed, essential for the groups to reach the highest levels of international recognition. This program, together with Structural Chemistry, constitutes a large core activity essential for the well-being of the Chemistry Section.

Effects of the KoF07-evaluation
The program benefitted through creation of two new interdisciplinary programs, on diamond materials as the program coordinator and as a partner in the graphene program. There is also a general feeling of satisfaction that the profile of the Department of Materials Chemistry now has wider recognition within the university as a consequence of KoF07.
Polymer Chemistry

General assessment of the unit
This program was established in 2001 and although relatively new and small it has established a remarkable program in the “bio-engineering” of an extracellular matrix using nature’s own biomaterials. The program ranges from basic organic and polymer chemistry to clinical applications.

Quality of research
The panel was impressed with both the depth and breadth of this program and it was unanimous in its assessment of this program as somewhere between internationally high standard and top-quality. There are only a few comparable programs in the world and it is remarkable that the Uppsala program has already achieved actual clinical success in humans.

Research environment and infrastructure
This program resides in the Department of Materials Chemistry, although it has components in organic and polymer chemistry, biochemistry and biology as well as clinical medicine. As best we can tell, the infrastructure is adequate to support the program.

Networks and collaborations
By its very nature this program has extensive collaborations in Sweden and Europe including experts in medicine. The program has generated publications as well as several patents and spin-offs such as IPRS, Termina, and Osstec.

Opportunities for renewal and emerging science
The program is already involved with many areas of societal needs such as bone regeneration and healing, arthritis and diabetes. There is, however, considerable further potential in a range of areas when the some of the underlying mechanisms are better understood, and this is an area the group is currently focused on. Opportunities range from the applied, for example the use of this approach and materials in animals (pets such as cats and dogs as well as race horses), to more basic research questions such as the possible use of hyloronan (or derived related materials) as transfection agents for gene delivery (gene therapy) and possibly targeted drug delivery.

Actions for successful development
The panel recommends continued strong support of this unique and successful program and, in particular the recruiting of additional young researchers (post-doctorals and young scientists) into the program. Assistance with “technology transfer” (acquiring worldwide patents, further commercialization, etc.) would further enhance the societal usefulness and benefits of this program.
Effects of the KoF07-evaluation
The program has evolved greatly since the KoF07 evaluation.

Structural Chemistry

General assessment of the unit
This well-established program, which falls naturally into one of the strategic research areas of the Faculty, i.e. Chemistry for Renewable Energy and Storage, has enjoyed new leadership since KoF07. It has a good distribution of personnel at all levels, with a large number of junior staff and PhD students. The program is undergoing a period of significant renewal with new, young staff and refocused priorities. Its two main areas of interest are battery materials and systems and theoretical inorganic chemistry.

Quality of research
Inevitably, with a significant number of new, young staff, it takes time to build research reputations. Nevertheless, overall the work and outputs are already internationally recognized.

Research environment and infrastructure
The program is well-placed in terms of personnel and facilities. Although the panel did not view the facilities, X-ray diffraction appears to be well-provided, but there is a severe lack of equipment and expertise in transmission electron microscopy.

Networks and collaborations
The program is involved in numerous national and international collaborations, especially in battery systems.

Opportunities for renewal and emerging science
The large diversity of the battery work, especially on lithium systems, which includes materials synthesis and evaluation, battery fabrication and testing and scale-up of production, means that the program is very well-placed to be at the forefront of developments.

Actions for successful development
The program has the personnel and funding necessary to achieve its objectives. A major issue that was frequently raised, by both staff and students, concerned the lack of clear strategy, at Faculty level, for the purchase and maintenance of expensive equipment such as TEM (this program) and NMR. A second issue was the distribution of teaching duties across departments and programs; some would welcome more teaching to improve their finances, whereas others felt their research productivity was curtailed by excessive teaching.
Effects of the KoF07-evaluation
None.
Scope of the panel's evaluation:
Department of Cell and Molecular Biology
Department of Organismal Biology
Department of Ecology and Genetics

General assessment
The panel was unanimous in its assessment that biology at Uppsala University is ranked excellent by any standard. We were impressed by the overall quality of biological research that is being pursued in the three departments and by the large number of research programs that are of top quality and at the forefront of their fields internationally. Of the programs that we saw, the lowest rating would only be of international stature, as opposed to world leading. All three departments have been consistently able to identify critical areas in their disciplines, often before other universities, and have done an excellent job in developing those areas at Uppsala. There has been tremendous progress in biology at Uppsala University in the last 25 years and the hiring from 1990 to 2000 was very strong. This ability to advance and improve biology at Uppsala University has been maintained, as these earlier faculty members assume leadership roles and bring in the next generation of researchers. We also note that the leadership in biology is still quite young, which portends very well for maintaining and accelerating the momentum of leading edges research in the departments.

Below we discuss in detail the programs that the committee identifies as either being international leaders at the cutting edge of research or as groups at a high international level. We also discuss the research environment and infrastructure, collaborations, future opportunities and the effects of the KoF07 evaluation. Importantly, these comments should be viewed in the context of an overall, truly outstanding program and one that is at a level that most universities can only aspire to achieve.

Finally, we realize that a week's visit and a set of documents can not give us a full appreciation of the departments and all of the issues, history and nuances that confront them. Our comments and recommendations should be viewed with this limitation in mind. Our review is meant to be constructive and supportive of dedicated and outstanding programs and departments with excellent potential for attaining even greater international distinction. We were impressed by the esprit de corps of many faculty and students and by their esteem for the university. The faculty, students and postdocs that we met are dedicated to the research, teaching, and service missions of the university. In general we found that moral is high and that students and faculty have a sense of pride in their accomplishments. We share their view that biology at Uppsala University is doing very well and that its potential for even greater distinction is high.
Quality of research

Here we discuss some of the research programs that were presented in the individual department visits and in the documentation that we were given. We did not receive CV’s for the faculty or descriptions of every research program, and the decision on which groups were presented to us was done by the departments. And, since we had three departments to review, we spent only a day with each department; we did not have time to cover all of a department’s research programs during this brief time. These limitations on the information we were provided consequently do not allow us to evaluate all of the research programs within a department. We cannot comment on whether or not some programs are struggling.

Department of Cell and Molecular Biology

The Department of Cell and Molecular Biology is organized into five thematic programs. The faculty within the programs has overlapping research interests; thus the clusters of individual research groups form cohesive research and training programs. Moreover, there is ample opportunity for synergism and collaboration among the groups in such areas as structural biology, microbiology, and molecular biology. The department overall is very strong, with a notable number of research groups that are of the highest quality – headed by international leaders in their respective fields of research. Another particularly positive aspect of the department is its efforts in teaching. Several faculty members commented directly on the importance of teaching and on the large number of students they teach. They noted the high international standard of their courses and that Uppsala University’s biology teaching was ranked among the best in Europe.

Program in Structural and Molecular Biology

The Structural and Molecular Biology group has undergone several recent changes and its size is greatly reduced from the past; we assume that some of the research programs that were previously in this area have been transferred to the Medical School. Nonetheless, the department contains individual research programs that are clearly world leading in their field. In particular, the research program on basal mechanisms of bacterial protein synthesis ranks among the world leaders of this field.

The review committee noted two issues for this group. With impending retirements, it is important to bring in young faculty members. We were particularly impressed with some of the outstanding young scientists who have great potential for international leadership. At this point in their career, a position for them at Uppsala is not secure. In particular the work in structural biology of the ribosome, with its highly collaborative nature, has the potential to maintain its traditional world leading status in a highly competitive area with strong biomedical significance. It would be to the group’s benefit to support young...
individuals from this group who have outstanding potential. It would be in the university’s interest to actively secure permanent positions for these young researchers.

We note that the main efforts of several structural research programs are aimed at potential drug targets for tuberculosis. We all resonate with the importance of new drugs to alleviate disease, particularly drug resistant tuberculosis, but point out that this is a highly competitive field with large international drug companies undertaking major efforts at drug discovery. It is not clear if all of these groups are making unique or world leading contributions to their respective drug discovery fields.

Program in Chemical Biology
The Chemical Biology group is also new, having started in 2011. The group in chemical biology has several solid research groups that clearly rise to the international level. We did not identify any individual program that currently rises to the level of world leadership. In some cases we questioned the potential of ongoing research for producing novel and significant advances in fundamental biological understanding. However some programs have clear potential to reach the top level. In particular the work on molecular immunology has great promise for basic research and also for the development of new therapies. The documentation of sporulation in *Mycobacteria* is of great interest. The crucial question of sporulation in *Mycobacterium tuberculosis* remains open; the answer will have impact for pathogenesis and the treatment of tuberculosis.

Program in Molecular Biophysics
The Laboratory of Molecular Biophysics began in 1996 and is an outstanding world-class program that represents in the committee’s view, the future of structural biology. The group seeks to understand biological systems by delving into molecular structure and organization. The group has been the world leader for a long time and many of the leading researchers in this field have been trained at Uppsala. This program brings great prestige to Uppsala University.

We note that other countries are developing whole institutes in this area, with dedicated buildings and large staff. The program, which was pioneered worldwide by an Uppsala scientist, will soon face increasing competition as other countries invest heavily in the emerging free electron laser (FEL) technology. The committee felt that Molecular Biophysics would be a good area to consider adding additional faculty slots to anchor the current program and to maintain Uppsala’s international leadership.

Program in Microbiology
The program in microbiology has in several areas, groups that are of top quality and world leaders. The discovery of new regulatory RNA's in bacteria and the elucidation of RNA regulatory circuits in stress response and virulence are at the forefront of research in an emerging area with potentially high biomedical
significance. No one has made more significant contributions in the area of bacterial antisense RNAs than this group. Although the field is somewhat smaller than many others represented in the department, the work on the intestinal parasite *Giardia*, particularly on host cell interactions, is top-quality, world-leading research. The group is applying RNA techniques to analyze specific genes important for pathogenesis. A newly initiated program in bacterial immunity also has the potential to make a significant contribution to this highly competitive field. Finally the addition of the group on molecular evolution, which is being moved from the Department of Organismal Biology, will further enhance the overall stature of the microbiology program and complement ongoing comparative genomics projects.

**Program in Computational and Systems Biology**

Computational biology, bioinformatics, and systems biology have recently been reorganized at Uppsala University. The new Computational and Systems Biology group encompasses structural biology, aspects of biochemistry and bioinformatics. The research programs within CSB all rise to the international level. In particular the work in structural biology, with its highly collaborative nature, has the potential to become world leading.

The committee spent some time discussing the role and location of bioinformatics at Uppsala University. Bioinformatics in general has two distinct aspects, a service component that assists biologists with data analysis, and a fundamental research component that seeks to develop new ways of understanding and analyzing data. The committee feels that at this time the university is best served by maintaining the strategy of placing bioinformatics in the biology programs that use bioinformatics for their research. These fields include genomics, molecular evolution, systematics, etc. At some future time, as more top level faculty in bioinformatics become available, a group that concentrates on developing new bioinformatics tools could be convened. Given this consideration of bioinformatics, the current organization for computation and systems biology should be kept as is, since the interests of the faculty overlap and they form a cohesive group.

**Department of Organismal Biology**

The Department of Organismal Biology was formed less than a year ago, in July 2010, with research programs from the previous Department of Physiology and Developmental Biology and the Department of Evolution, Genomics and Systematics. The department continues to be in flux, with the strong program in Molecular Evolution relocating to the Department of Cell and Molecular Biology. In addition, the program in Physiological Botany will be relocated to the Department of Plant Biology and Forest Genetics at the Swedish University of Agricultural Sciences. At some point, the size of this department may
drop below a critical mass and we note that there are clear areas of overlap between other departments and the remaining programs in Organismal Biology (e.g., evolution and development in Organismal Biology and the Department of Ecology and Genetics). Remaining currently in the department are groups in Comparative Physiology, Evolution and Development, Environmental Toxicology, and Systematics. There are several outstanding groups within the department that rank at the forefront of their respective areas of research.

Program in Comparative Physiology
The group in comparative physiology is a world leader in the field of invertebrate immunology, particularly regarding melanization and its induction. This group has had a very long record of innovative and distinguished contributions. However, the future of this group is challenged by impending retirements. While these retirements are a challenge for the department, they also represent an opportunity to redirect comparative physiology and perhaps allow it to serve as more of a bridge between the functional research in Organismal Biology and the Ecology and Genetics groups. Currently in the Departments of Organismal Biology and of Ecology and Genetics, genomic differences are often directly correlated to morphological traits and behavior without characterizing the underlying mechanistic connections on the physiological level, which is needed to develop a full understanding of the problem. In particular, such a bridging function would be important if Biology were to be reorganized into two departments as we suggest below.

Program in Evolution and Development
Uppsala is a world leader in early vertebrate evolution. The research output of the palentological group is astounding with an unprecedented number of publications in Science and Nature. Particularly exciting is the integration of paleontology with developmental biology and the setting up of a zebra fish facility for this work. The addition of a new developmental biologist will greatly add to the potential of this group and will no doubt lead to even greater productivity and a potential synergy between the behavior and development work, and the developmental basis of vertebrate evolution. This area has the potential to set the direction for an entire field. The committee was particularly impressed with the dedication and enthusiasm of this outstanding group of researchers, whose work has greatly added to Uppsala’s international prestige.

Program in Molecular Evolution
The molecular evolution group conducts world-leading research in microbial systems. This group is using genomic analyses to understand evolutionary processes in bacteria. The group has a strong record of outstanding contributions that appear regularly in the best journals of the field. Also of world leading stature is the group which examines the archaeal cell cycle and which has also discovered multiple chromosome replication origins. The entire Molecular Evo-
olution program will be moving to MCB where they already have collaborations on microbial genomics. However, molecular evolution is central to many disciplines including evolution, systematics, genomics and molecular biology. Placing the group in with MCB, particularly if the group continues to have a bioinformatics component will be a loss for the other two departments, since research groups in these departments also have strong interests in molecular evolution.

Programs in Environmental Toxicology and Systematics
Both Environmental Toxicology and Systematics are strong groups that have reached international stature. They have established strong collaborations across the world and are recognized internationally for their significant contributions. Both groups have very strong publication records and contribute significantly to the overall stature of Biology at Uppsala University. Environmental toxicology is well funded and produces results and expertise that are in high demand from society. The systematics program produces both top-level research on deep phylogeny, and fulfills the important task of recording biodiversity.

Department of Ecology and Genetics

The department has a strong evolutionary theme and is part of the Evolutionary Biology Centre. There are significant overlaps in research areas among the programs that add to the overall strength of the department.

Both the presentations during our visit and the written documentation were organized by research group in a specific field rather than by presenting the research of the five programs. Our discussion follows the organization of the presentations. The first three areas discussed are world-leading.

Group in Speciation
The committee considered the work being done on speciation in flycatchers to be truly excellent and world leading. Their combination of approaches and the wide range of these studies, from field observations to genomics, have made this one of the best systems for study of speciation in the world. The collaborative work done with the genomics group is outstanding and represents the leading edge of speciation work.

Group in Molecular Evolution and Evolutionary Genomics
This is an outstanding group of clear world leaders. The work on the evolutionary implications of sex-linkage and the evolutionary genetics of female heterogamety set the standards for the field. This is a broad creative group asking
significant questions and employs the most advanced genomic analysis. It is also clear that the genomics research strength from this group is influencing and strengthening other programs in this department.

**Group in Carbon Cycling**
This group is on the forefront of the field, internationally. The work on the carbon contributions of inland lakes to the global cycle is little studied but potentially important for understanding global climate change. The committee felt there were several opportunities for collaboration, including with the microbial genomics groups that could lead to novel and productive research directions.

**Group studying Sexual Conflict**
This is another area of distinguished work and the work at Uppsala has helped define the field. Again, current work is at the cutting edge, employing transcriptomics to understand the evolutionary implications of sexual conflict and exploring the genetic implications of inter- and intra-sexual genomic conflict. The key for this group will be to anticipate how the field is changing, and respond to, if not direct, these changes.

**Groups that meet internationally high standards**
The other groups presented to us have reached the level of internationally distinction: evolutionary biology of aging, environmental microbial genomes, human evolution, and plant adaptation. In particular the program on human evolution shows great promise in combining genetic analysis with computational competence, and has the potential to become top-quality – world leading.

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**Research environment and infrastructure – Biology**

**Department organization at Uppsala**
The committee strongly feels that the Department of Organismal Biology and the Department of Ecology and Genetics should merge into a single department. The committee understands that there has been a history of merging and then splitting departments and that this has been challenging for the research groups. But, at this point in time there seems no compelling reason to have the two departments separate. Organismal biology has shrunk to a size that may not be sustainable as an independent department. And, many of the research groups have overlapping interests with those in the other departments. Having the two departments combined will allow more interaction among researchers; it will allow a more comprehensive training program for graduate students and postdocs, and it will lead to greater administrative efficiency. Most importantly it will allow this excellent group of faculty to effectively speak for its own interests and to develop a compelling shared vision, both of which are currently lacking.
An argument for not merging the departments has been the potential size of the merged department, which was a problem in one of the previous organizations of biology. We note that this is a different point in time. Individual research groups are becoming more comfortable being within a department (as opposed to being their own department). Moreover, organismal biology will lose two research groups, one will move into MCB and the other to the Swedish University of Agricultural Sciences, thus decreasing significantly the size of the Department of Organismal Biology.

Infrastructure
The physical infrastructure for biological research seems very good. The laboratories that we were shown are of high quality with adequate space and up to date equipment. The university has a field station at Lake Erken that is essential for environmental work. There was some concern expressed on the ability to provide maintenance of the field station. One issue that seemed of particular concern to several groups was the “rent” charge that was levied for space. There was some concern that the rent charges were too high and that the footprint of laboratories was becoming too small to adequately support research, in an attempt to reduce rent charges. Others were concerned that some research groups will actually need to close because of the levied rent.

Collaborations and local interactions
Many of the groups still view themselves as independent programs, with little overlap and contact between groups. This was a common perception across all three departments and seems to be a historical artifact from the time when research groups were each a self-contained department. The committee felt there were many areas of common interest among groups, in such areas as genomics, water, immunology, etc. There appear to be artificial barriers to crossing program lines that inhibits the considerable synergy that could be gained by interactions among the programs. This led us to the concern that students and postdoc are not learning as much as they could from each other, since they seem to stay within their own groups. As modern biologists, they need cross-disciplinary training in order to compete internationally.

The committee recommends that Organismal and Ecology and Genetics develop a joint seminar series featuring local researchers that is required attendance (when on campus) for all faculty, graduate students and postdocs. Such seminars serve not only to acquaint groups with each other’s research but also to develop cohesion among groups.

Science for Life Laboratory
We had heard throughout our visit comments on the Science for Life Laboratory. We requested an overview of the program and this was very kindly accommodated at the last minute. The committee felt that SciLifeLab is an exciting opportunity for biology at Uppsala University. It will provide a technological
platform for modern biology and will be an asset to many of the research programs in all three departments. We heard many concerns about SciLifeLab including that it would not be available to many groups, that participation and support was determined by political issues, and that various groups were being purposely excluded.

Based on our briefing we did not share these concerns and feel that very strong effort has been made to be inclusive. However, given the magnitude of investment by the Swedish Government and the outstanding opportunity SciLifeLab represents, it would be useful to reassure the community so that the processes and decisions regarding SciLifeLab are perceived as transparent, are based on the best science, and that lines of communication are open.

**Governance**

Faculty would like more voice in decisions and they wish for more involvement in choosing their new colleagues. There was some sense that decisions were made at a very high level and imposed on the faculty without consultation, and that these decisions were not always based on science. We cannot assess these claims. We understand that the university is part of the Swedish Government with its accompanying constraints. Regardless, the Biology faculty, from all three programs, represents a huge resource of talent and dedication. Having the faculty participate more openly in hiring and in setting directions for research can only improve the university. In particular the faculty seem unclear about the rules and practices for recruitment. We understand that practices have changed and it would be good to clarify them so that the faculty feels it has representation in the process.

**Support staff**

We heard repeated concerns about staffing issues for common facilities. Facilities in some cases have been constructed with no provision for maintenance and staffing. This is a very common problem worldwide. It is becoming the usual practice in the universities that the panel represents, to include such funds for running the facility when the facility is planned and initially funded.

**Networks and collaborations**

The research programs in the three departments are of international stature. We were impressed with the very broad international collaborations within many of the programs. There is no lack of networks or collaborations within Biology. In fact, many of the programs had more international connections than local connections.

**Opportunities for renewal and emerging science**

The Biology faculty at Uppsala has done an outstanding job of creating dynamic,
leading edge programs and, we are exceedingly confident, will continue to do so. We have noted numerous groups that are at the level of world leaders in their respective fields. These groups have a clear sense of vision for their research and for emerging areas. We feel the best strategy for this extraordinary collection of talent is to let them continue to develop their programs. They have identified several new hires that seem appropriate: developmental biology, a theoretical biologist, and a structural biologist among others.

**Actions for successful development**
These recommendations are discussed in the above sections. The major recommendations are:

1. Combine the Department of Organismal Biology and the Department of Ecology and Genetics into a single department.
2. Encourage the departments to develop programs that alleviate the barriers that currently exist between programs.
4. Support and enhance the wide range of excellent programs in Biology at Uppsala.

**Effects of the KoF07-evaluation**
It is difficult to access the progress of previous recommendations since the department structure has changed so greatly and individuals are not specified in the review document. However we can make the following observations:

- Bioinformatics. It was recommended previously that this activity be dispersed among relevant departments. In response, the Linnaean Center was discontinued and the Computational Program convened. We agree with this previous recommendation and believe that the current location of bioinformatics is optimal for future Biological research at Uppsala University.
- The previous recommendations specified that neurobiologists be clustered together. We did not see any neurobiology and assume that it has been clustered together in the medical school, which would be an appropriate location for these groups.
- The previous review noted a lack of interaction among programs and suggested that joint activities such as seminars be developed that help foster interactions. We note the same problem still exists and suggest above a faculty seminar series that would introduce faculty to groups across the department.
- The previous review noted that the molecular evolution was outstanding. The program did not receive any additional resources as a result of KoF07. The program is currently being moved to the Cell and Molecular Biology department. It will also become part of SciLifeLab, in association with which some extra funding is provided.
• The previous report noted that there was a need for improved databases and integration in bioinformatics and computer resources. In the current review the computation group was satisfied and in fact complimented the university’s computer resources.

Other issues
Research in biology at Uppsala University not only seeks to understand fundamental principles of biology, but also directly address important societal issues in health and the environment. Included are socially relevant studies in biology in the areas of conservation biology, carbon cycling, microbial genomes, drug discovery, climate change, and basic work on the disease organisms, *Giardia* and *Mycobacteria*.
Scope of the panel’s evaluation:
Department of Earth Sciences
Global Energy Systems Group in the Department of Physics and Astronomy

Department of Earth Sciences

Executive summary
The Department of Earth Sciences in Uppsala encompasses a very wide range of disciplines, including aspects traditionally classed as geology, geophysics, physical geography, hydrology, meteorology, and environmental sciences (including biological and chemical themes). This breadth is an unusual feature in the European context, and is one of the strengths of the department. It offers great potential in terms of work of international importance, and the history of the subject shows that such breadth has often fostered major scientific breakthroughs. The department is divided formally into four programmes, namely (a) Air, Water and Landscape Sciences (LUVAL), (b) Palaeobiology, (c) Solid Earth Geology, and (d) Geophysics.

Based on productivity and scientific quality, the Department of Earth Sciences is an internationally well-recognized department, with excellent internal communication and collaboration. It was well rated in the 2007 KoF report, with islands of world-leading research, and there have been considerable improvements since then. Several research programmes within the department are assessed as top quality, leading the international agenda, and most are of high international standard. Existing staff, and newly appointed staff have achieved considerable success in developing large-scale research programmes, many with multiple external partners. Overall, the department has considerably improved its external research funding, and it is in a good position to consider hiring some additional staff.

Through the presentations and discussions, the evaluation panel found a number of common features among the different research groups of the Department of Earth Sciences. Key findings and recommendations of general importance for the future development and management of the department are:

1. We note with satisfaction that all indicators of research activity are rising fast: numbers of publications in international journals, numbers of citations, external research income, income from EU grants, numbers of PhD students, involvement in and leadership of large networks, and volume of collaborative activity. Further, in the area of education, student numbers, and especially international student numbers, have also risen.
2. The quality has improved overall since KoF07 in three ways:
   • The three world-leading programmes from 2007 (Air/water Exchange Processes, Palaeobiology, Applied Geophysics) are still top-quality, and the volume at that level has increased slightly (number of researchers).
   • New hires have improved many internationally recognized programmes to internationally high standard.
   • There are no longer any programmes at the ‘acceptable’ or lower level.

3. Therefore we were surprised to discover that faculty support for the department has not kept pace with their much-improved performance. For such a broad range of key themes, including leaders in natural resources, energy, natural hazards, and life sciences (tree of life/ origins), investment in a modest rise in academic staff numbers would seem appropriate.

4. We wish to stress two aspects of the cost base of teaching and researching in the earth sciences, which might lead to a re-consideration of the basis of the allocations algorithm within the Faculty:
   • Earth sciences education involves substantial laboratory and fieldwork components, and these make teaching the subject as expensive as the better funded physical sciences.
   • Further, much of the research is laboratory based, and we found evidence of underinvestment and insufficient technical support in some laboratories.

5. The panel noted the very friendly environment and good working relationships that exist within the department. This provides an ideal basis for increasing internal cooperation in planning ambitious research themes.

6. In noting the success of KoF07 investments in the Evo-devo and Meteorology programmes, the panel recommends strongly that these programmes continue without reduction of funding. The same applies to the other programmes supported after KoF07.

7. The department is well placed to contribute to the new themes on Natural resources, Natural disasters, and Energy because they combine fundamental science questions about causes and the way the Earth works with issues of considerable societal and commercial importance.

8. Many staff feel technical support is poor, but most understand that this is an issue for consideration within the department, and that specialist technical support should generally be supported from external grant funding.

9. There will be a serious issue in the future concerning the replacement and purchase of state-of-the-art equipment, some of which is expensive. The university and Faculty should develop schemes to judge and prioritise requests for equipment, and identify external and internal funding sources.

10. The department is happy with its current accommodation in the Geocentrum, and there are practical benefits in being closely linked with the Geological Survey of Sweden (SGU) and the Centre for Sustainable Devel-
11. Cooperation with the SGU has improved substantially since 2007, with the initiation of joint research projects on regional geological problems, deep drilling energy research, seismology, mineral resources, earth sciences outreach, and other themes.

12. A national strategy for the earth sciences has been developed by SGU and the department, following recommendations in KoF07.

13. Following recommendations in 2007, the department has brought in several senior visiting professors on 5–25% salary costs, who provide teaching and, especially, co-direction of PhD research and some research. The visiting professors in several cases have helped to enhance the scientific level. This, and planned scholarships for overseas students, may help the department develop further its European collaborations and funding, and especially, wider links with institutions outside Europe.

14. The new MSc structure provides opportunities for the department to rethink its graduate-level teaching, set the standard at an ambitious level, and engage the Masters students in serious, high-level, publishable research.

15. PhD recruitment appears to be linked to success in obtaining grants, and so reflects to some extent the relative success of the different research programmes. The panel stresses the need to make sure that students appointed to these positions are the strongest possible by making the interview process widely based. Further, the panel can see no evidence that numbers of PhD students should be reduced – there should be more PhD students than postdocs in order to keep some balance in the jobs market.

16. The department expressed concerns about the termination of junior research associate (forskarassistent) positions. The department has relied on these to keep a flow of two or three new people each year whose research contributed strongly to their groups, and who might or might not eventually be offered a permanent position. The department fears that the new tenure-track model might discourage such high levels of activity among junior appointees, and perhaps lock some weaker candidates into the system.

17. It is important that junior academic staff are given mentoring by senior staff about planning their research portfolios. The rising pressure to obtain small funds for every circumstance can act against the achievement of truly world-leading research results: junior staff may become obsessed with securing small pots of money to buy equipment or fund a PhD, and lose sight of the need to have the courage to lead in their international collaborations. There has been a tendency at times for the Swedish scientists to step back and allow an overseas scientist to lead projects and publications, and this is not always appropriate.


Specific conclusions and recommendations; Summary

Following is a summary of the evaluation panel’s specific recommendations and conclusions on the quality of research:

- Water Climate and Environment: The quality of the present research is assessed to be internationally high standard. When the two newly recruited professors get fully integrated, the group ought to be able to reach the top-quality level. The panel recommends that the group formulates a clear research strategy exploiting its cumulative strengths.

- Ice and Climate: The work of this group is internationally recognized and approaches internationally high standard, in particular for the work on ice-core analysis and the cooperation with Utrecht University. Strong new directions are the non-hydrostatic (high-resolution) modelling of atmospheric processes over ice and their role in the mass balance (in particular precipitation processes).

- Geohydrology: The quality of research is assessed to be internationally high standard with a potential for improved international impacts. The panel recommends that the number of permanent positions be increased by one, when some of the present temporary positions expire.

- Air–Water Exchange Processes: The work of this group is overall regarded as of internationally high standard, and the work on water-side convection and its impacts on carbon dioxide transfer, is regarded as top-quality. The work on exchange processes of greenhouse and energy exchange processes over lakes, and the focus on atmosphere–water exchange processes is expected to be beneficial for the modelling of “polar lows”.

- Palaeobiology: We identify the quality of work across the group as uniformly of international standard, ranging from internationally high standard to internationally recognized, and with the programmes on evo-devo, roots of metazoan evolution, and Neoproterozoic to Cambrian life as top-quality. It will be crucial to replace retiring staff, especially in the Neoproterozoic microfossil theme.

- Tectonics and Geodynamics: The quality of the work in this area generally ranges from internationally recognized to internationally high standard. They are among world leaders in laboratory-based structural geology, but it is harder to gauge the general impact of work in this rather specialized field on the broader subject area of tectonics. There may be opportunities for the group as a whole to increase its impact through carefully considering the balance between academic research and high-quality applied research, and whether they could identify particular themes or unifying topics of wide applicability or interest.

- Mineralogy and Petrology: The work includes a mix of internationally recognized and internationally high standard work. The new Microprobe offers massive potential for more ambitious geochemical work, and the fu-
ture Swedish synchrotron facility will be especially important in some of the high-pressure studies. We recommend a re-evaluation of the means and extent to which technical support is provided, especially for the Microprobe. The panel was a little worried at the sheer range (both intellectual and geographical) and number of collaborative international projects the petrology group was involved in, and some focus may be helpful in establishing a unique theme for the Uppsala group.

- **Earthquake Seismology and Geodynamic Modelling:** We identify a mix of internationally recognized and internationally high standard quality classes in this area. The Swedish Seismological Network is a unique asset that could be exploited much further in research and engagement worldwide, by publishing more synoptic analyses of the data, and by eventually making the data freely available through the internet.

- **Applied Geophysics:** The group’s work is ranked top-quality for the seismic and electromagnetic parts of the programme. Since airborne geophysics plays a key role in the applied geophysics group, the panel strongly recommends that the department create an appropriate professorship in applied geophysics after the current Professor of Electromagnetic Geophysics retires in March 2012. This group is particularly well placed to contribute importantly to national strategic priorities in energy, natural resources, and hazards.

**Introduction**

The evaluation took place on May 16–20, 2011. It included two days of plenary sessions at the university and faculty levels and three days of interviews and on-site evaluation at the Department of Earth Sciences.

The evaluation panel was given excellent conditions for its work. The information meetings, presentations and interviews with the professors, junior academics, postdocs, and PhD students at the Department of Earth Sciences were well organised, taking place in an open and friendly atmosphere.

The evaluation panel evaluated the research groups according to the divisions proposed by the department and represented in individual presentations. All research programmes were evaluated, unlike in 2007, when some smaller groups, and especially those whose professors were close to retirement, were not considered.

The Department of Earth Sciences was established in 1998 through merger of the former Department of Geophysics, Department of Meteorology, and Department of Earth Science. The latter was created in 1994 through merger of the former Department of Physical Geography, Department of Quaternary Geology, Department of Geology, and Department of Palaeontology and Historical Geology. It is now one of the most comprehensive earth science departments in Europe. The department presently has 18 professors (21 in 2007), 23 senior
lecturers and researchers (25 in 2007), 10 postdocs and assistant professors (11 in 2007), 62 doctoral students (35 on salaries, 27 on stipends, compared to 47 in all in 2007). Including the salaried PhD students, there are 86 research-active staff, and 31 others, making the research active staff 73% of the total. In addition, there are about 460 full-time undergraduates and Masters students, of which about one-third are Masters. Including part-time students and students in distance-education programmes, the department is responsible for the education of about 1340 students.

The department operates on a budget of about SEK 127 million per year. External funding in 2010 amounted to € 3.3 million, mainly from Swedish sources, and commissioned research € 0.6 million. In proportional terms, funding from the Faculty has reduced from 12% to 9.5% of the overall Faculty budget, at the same time that external funding has risen from 4 to 5%.

The department produced nearly 200 papers in 2010, up from 145 in 2007 (DiVA publication repository), and productivity remains roughly constant at 2.4 papers per permanent member of staff per year.

**Effects of the KoF07-evaluation**

The department picked up nine key criticisms and recommendations from the 2007 KoF report, and they have responded to those points, reflecting excellent actions from the department, as well as support from the university and Faculty, as follows:

1. National earth sciences strategy paper should be prepared: Initiated/ongoing with the Geological Survey of Sweden as lead partner.
2. Increased internal cooperation suggested: Centre for Natural Disaster Science/Swedish International Development Cooperation Agency (SIDA); Carbon dioxide storage.
3. Increased national cooperation should be established: new joint projects with University of Gothenburg, Royal Institute of Technology (KTH), Chalmers, Swedish University of Agricultural Sciences (SLU), Karlstad University, Luleå University of Technology, Swedish National Defence College, University of Stockholm, Lund University, and Swedish Museum of Natural History.
5. Cooperation with the Geological Survey of Sweden should be improved: Adjunct Professor from SGU has been hired and is working on national strategic issues.
6. Bring in overseas researchers: six top-level guest professors from U.K., U.S., China and Germany have been hired.
7. Improve the visibility of departmental research and education: the web site is still out of date and inaccurate in parts, but the department plans to hire a communications strategist/information officer to take care of this.
8. Seven professors (four chairs), three senior lecturers, two senior researchers and six assistant professors have been recruited to strengthen the department.

9. The department received direct faculty funding for cooperation with biology on two topics as a result of KoF07, namely Carbon in aquatic systems and Evo-Devo research.

The Department of Earth Sciences worked with decreasing funds and general downsizing of the scientific and technical staff throughout the 1999–2007 period, but was able to begin replacing staff after that, and especially since the KoF07-report, partly as a result of planned retirements (7 professors retired between 2008 and 2010). Since the KoF07-report, the following new research staff have been hired:

- Seven new professors, namely: petrology (Valentin Troll), aquatic climatology (Kevin Bishop), hydrology (Jan Seibert), seismology (Roland Roberts), geophysics (Christopher Juhlin), physical geography (Veijo Pohjola), and palaeobiology (Graham Budd). Of these, three (Troll, Seibert, Bishop) were externally recruited.
- Three new senior lecturers (Magnus Hellqvist, Therese Isaksson and Karin Högdahl), in palaeobiology, construction engineering, and geology.
- Two senior researchers funded by the Swedish Research Council (Ari Tryggvason, geophysics, and Michael Streng, palaeobiology) and one by the Royal Swedish Academy of Sciences (Jorijntje Henderiks, palaeobiology).
- Seven new assistant professors, 4-year positions (Fritjof Fagerlund, Prabhat Sharma, Abigail Barker, Zoya Zarifi, Benjamin Kear, Faramarz Nilfouroushan, and Erik Sahlée).

Evaluations and recommendations

Air, Water and Landscape Sciences (LUVAL)

The department’s programme on Air, Water and Landscape Sciences involves four research groups: Water, Climate and Environment; Ice and Climate; Air–Water Exchange Platform; and Geohydrology.

LUVAL is the largest programme at the department covering a broad range of disciplines. All research themes share an interdisciplinary approach to the atmosphere, biosphere, cryosphere, geosphere, and hydrosphere, using a combination of empirical work and modelling. While the four groups mostly have their own independent activities, combining these four themes into one large programme facilitates the increasing cooperation between the groups that gradually develops in these years. The work relates to wider university themes in climate, energy, natural disasters, and sustainable development.

New appointments have strengthened many of these programmes, and this
is reflected in substantial changes in emphasis under certain headings since the 2007 KoF report. In particular, the Ice and Climate theme is a new programme, building on the small Glaciology group evaluated in 2007. At present, there are 36 staff and 23 PhD students, making 59 research personnel in all. In terms of publications, income, staff and student numbers, LUVAL comprises 35–40% of the Department of Earth Sciences. Over the past five years, most indicators have remained constant, except for an increase in external funds from € 1.5 to 2.5 million.

Water, Climate and Environment

**General assessment of the unit**
The group today comprises five professors, two assistant professors and four PhD students. In addition, two internationally recognised/outstanding visiting professors support the group through PhD courses and supervision.

Since KoF07 significant positive developments have taken place. The research now gives more priority to the previously stronger research themes (Surface Hydrology and Climate and Aquatic Modelling) and less priority to a previously weaker theme (Water Resources Management). Furthermore, the global modelling activities have now produced novel scientific results of international interest. Finally, the group has been strengthened significantly by external recruitment of two professors in aquatic climatology and hydrology with international top-level modelling expertise. The research strategy of the group does, however, not appear clear and focussed. This can maybe be explained by the late recruitment (2010) and the fact that the two new professors are currently only 50% and 20% employed at Uppsala University.

The group’s main research efforts cover three related fields: (i) hydrological modelling ranging in scales from hillslope over catchments to the global scale with a focus on climate relates issues and uncertainties involved; (ii) aquatic climatology focussing on climate impacts on water quality and carbon processes in the landscape; and (iii) modelling of lakes and the Baltic Sea.

**Quality of research**
The quality of the present research is assessed to be internationally high standard. When the two newly recruited professors get fully integrated, the group ought to be able to reach the top-quality level.

**Research environment and infrastructure**
Most of the research is modelling and does not require specialised equipment.

**Networks and collaboration**
The group is well connected internationally and the professors and visiting professors have excellent personal networks internationally.
**Opportunities for renewal and emerging science**

With the recruitment of the two new professors the group gets valuable and relevant complementary expertise. When the two new professors are employed full-time, the group will comprise both the critical mass of permanently employed scientists and the scientific qualifications to enable the group to develop unique top-quality level research with great international impacts.

**Actions for successful development**

A clear research strategy should be formulated exploiting the cumulative strengths within the group, and new research activities, including additional PhD students, should be initiated to achieve the strategic goals.

**Ice and Climate**

**General assessment of the unit**

This is a new theme and originates from research originally at various disciplinary programmes (Physical Geography, Quaternary Sciences and Meteorology). As such the panel is pleased to see that the recommendation of the KoF07 has been followed to “combine the traditional strengths of this theme with studies of boundary layer meteorology”. The group focuses on: (i) mass balance of terrestrial snow and ice and the related atmospheric and cryospheric processes; (ii) ice dynamics; (iii) climate and environment variability in the past; and (iv) predictions of snow and ice mass balance. In addition an interesting study has been undertaken on understanding the various snow conditions in Lapland and how these impact on food gathering of reindeer due to recent warming episodes.

**Quality of research**

The work of this group is internationally recognized and approaches internationally high standard, in particular for the collaboration efforts undertaken in the international projects on ice-core analysis and the cooperation with Utrecht University.

**Research environment and infrastructure**

The tools applied include field and laboratory techniques, such as: a) ice core analysis (isotope mass-spectrometry and ion chromatography); b) geophysical and geodetic methods; c) atmospheric and cryospheric modelling; and d) remote sensing as well as field studies.

**Networks and collaborations**

The group is active within several international and interdisciplinary projects, such as the prestigious platforms GAP, NEEM, SVALI, and SvalGlac. Participation in these platforms is a result of strong engagement and experience in the past, such as involvement in International Polar Year (IPY) projects, and the
large ice core projects. The group has also a fruitful relationship with the international leading Ice and climate group at Utrecht University (NL).

Opportunities for renewal and emerging science
Opportunities for emerging science are the non-hydrostatic (high-resolution) modelling of atmospheric processes over ice and their role in the mass balance (in particular precipitation processes), as well as the representation of stratified boundary layers over ice.

Actions for successful development
The group would gain even further strengths and international recognition if they would further focus their work as suggested above, under Opportunities.

Geohydrology

General assessment of the unit
The group today comprises one professor, one senior researcher, two assistant professors, one postdoc and six PhD students. In addition, an internationally recognised/outstanding visiting professor supports the group. The relatively young and very competent research group is well functioning under an excellent leadership.

Since KoF07 the group has experienced major positive developments in terms of recruitment of young, talented researchers, focussing of research themes and attraction of major external research funding.

The group’s main research effort is presently related to the Uppsala University co-ordinated large-scale integrated EU FP7 project MUSTANG on CO₂ storage in saline aquifers. In addition, research is performed on DNAPL dissolution in fractured rocks, use of nanoparticles in subsurface remediation and the role of redox-sensitive compounds in groundwater systems and groundwater remediation.

Quality of research
The group has a good publication rate in top class international journals. We assess the quality to be of internationally high standard with a potential for improved international impacts, when the results of the ongoing major research efforts become published, and if resources are secured to ensure continued research in the ongoing research fields during the coming years.

Research environment and infrastructure
The research is based on a combination of field and laboratory experiments and numerical modelling. In this regard, new state-of-the-art laboratory facilities for studying subsurface transport have been established. In order to enhance the laboratory-based research the group will need some support from the Fac-
ulty to further develop and maintain its laboratory facilities. Facilities for field experiments have been project financed, while modelling is based on existing state-of-the-art codes such as TOUGH2 from the Lawrence Berkeley National Laboratory.

**Networks and collaborations**
The group is well connected internationally with collaborations including world leading researchers.

**Opportunities for renewal and emerging science**
There is a great potential for achieving synergy effects with other programmes at the department through enhanced cooperation with the applied geophysics group on geological CO$_2$ storage, deep rocks hydrology (deep drilling project COSC) as well as on geophysical mapping of near surface properties.

**Actions for successful development**
The group should be encouraged to pursue the present positive development. Two permanent positions are below critical mass to ensure a top quality international position within more than very narrow niches of geohydrology. The panel therefore recommends that the number of permanent positions be increased by one, when some of the present temporary positions expire.

**Air–Water Exchange Processes**

**General assessment of the unit**
Research by the programme on atmosphere–water exchange processes aims at improving basic knowledge through analysis of high-quality micro-meteorological measurements over water (marine conditions and lakes), as well as the use of turbulence simulations and regional-scale modelling. The group is a continuation of the previous Meteorology group and has been recently enhanced by the appointment of a new staff member and by the promotion of a full professor. The group has identified and applied new mechanisms for the turbulent exchange in the marine atmosphere in the presence of long surface waves (swell). A new mechanism significantly enhancing the air–sea exchange of carbon dioxide (and possibly other gases) was identified and formulated. As such it was found that also water-side convection impacts on the carbon dioxide transfer.

**Quality of research**
The work of this group is overall regarded as of internationally high standard. In particular, the recent novel research on water-side convection and its impacts on carbon dioxide transfer, is regarded as top-quality. This is regarded as a major achievement and is expected to improve the performance of an essential process in the modelling of atmosphere–water exchanges of the climate system.
addition the researchers have shown their ability to extend their findings from process studies to major modelling activities.

Research environment and infrastructure
The work of the group depends strongly on gathering and analysis of field data, in particular the use of the marine observation site at Östergarnsholm. Attention should be given to secure this unique facility as well as support for the new initiatives to study the exchange processes over lakes. The group has demonstrated that it can access and use fine-scale and regional models of leading institutes.

Networks and collaborations
The cooperation with the group of Pete Sullivan at NCAR (Boulder, CO), as well as the cooperation with the Swedish Meteorological and Hydrological Institute (SMHI) and other institutes is regarded as a very good strategy in combination with the emphasis of the group on performing unique fieldwork and the understanding of exchange processes over water.

Opportunities for renewal and emerging science
The group has already taken the initiative to study exchange processes of greenhouse and energy exchange processes over lakes which is an excellent choice given the capabilities of the group as well as its particular relevance for northern countries like Sweden. In addition, the focus on atmosphere–water exchange processes is expected to be beneficial for the modelling of “polar lows”, which contribute to extreme weather events in the Baltic.

Actions for successful development
Given the unique data sets and facilities of the group, the group could further play an international leading role by setting up an international benchmark of model formulations for the exchange processes over water surfaces as in current use for weather and climate studies (such as undertaken by the GEWEX Atmospheric Boundary layer study, see http://www.gewex.org).

Palaeobiology
The Palaeobiology Group in Uppsala has substantially restructured since the 2007 KoF report: in particular, the three palaeontological programmes, which presented themselves separately at that time (Palaeobiology, Micropalaeontology, Invertebrate palaeontology), have integrated their research and made new appointments to cement links within the group, and with external players, including the evo-devo group in Biology. Further, one palaeobiology researcher who was then employed on a non-permanent, junior position, and rated as
‘world-leading’, has since been promoted to Professor, and two new appointments have strengthened the micropalaeontology activity and links with workers in natural disaster science and polar science. The group presented its work in two sections (palaeobiology and phylogeny of Metazoa; micropalaeontology), but it operates as one group, and we report accordingly.

**General assessment of the unit**

The Palaeobiology group currently consists of 4 professors, 3 visiting professors, 7 other staff, and 6 PhD students, with considerable external funding. The group has been successful in terms of attracting new staff (even though they remain the smallest group in the department), in external funding (€ 1 million from 2005–2010), and especially in publications: they identify a total of 144 publications from 2008–2010, including eight in *Nature and Science* since 2000, and attracting 3500 citations overall. These measures of impact through publications are probably the most impressive of all the programmes and groups we investigated. A key threat to the group is that two of the professors retire soon, one in 2012, and one in five years, and if their positions are not refilled, the existing top-quality activity of the group will be much reduced.

**Quality of research**

We especially note the strengths of the group in their long-term research field of Precambrian and Cambrian life. Whereas this research work was originally focused on identifying and describing remarkable fossils, especially from fossil Lagerstätten around the world, and placing these fossils in stratigraphic context, the group has lifted its work in this field to a higher level in recent years. Their focus now places the work at the heart of modern evo-devo research, linking patterns in the tree of life with patterns of genomic control of biological development. Modern molecular studies of phylogeny can delve into the deepest roots of the tree of life, but the accuracy of those phylogenetic estimates diminishes as one penetrates deeper into geological time. Further, vast swathes of biodiversity are absent if the fossils are ignored, and it appears that novelties of clades appear suddenly and in great packages – the fossils allow analysts to place the acquisition of novelties in correct temporal sequence and to allow estimation of the time taken to effect major evolutionary transitions.

The work linking Cambrian fossils, basal arthropods, priapulid genome sequencing, and fundamental metazoan character acquisitions are all rated as top-quality, based on actual achievements (eight papers in *Nature and Science*, together with high citation) as well as potential. Other linked palaeontological work on Cambrian fossils and stratigraphy, on Precambrian algae and other microfossils, and on vertebrates is rated as a mix of internationally recognized and internationally high standard, differentiating between relatively predictable descriptions of fossils in international journals (IR) and more substantial, problem-oriented phylogenetic and methods-based work (IHS). We note especially the strong impact of the internationally high standard to top-quality work.
on Neoproterozoic microfossils and its potential for resolving dating of deep branches in the tree of life, as well as interactions between early life and major environmental change, including the so-called ‘Snowball Earth’ – the Uppsala group is the best in Europe in this field, and the topic must be retained as a key contributor in deep time, tree of life, and origin of life research themes.

**Research environment and infrastructure**

The group appears to have the laboratory facilities it needs, with access to an SEM, photographic facilities, light microscopes, and with shared access to other facilities, such as gene sequencing labs, in other departments in Uppsala. The group has also gained access to newer technical equipment, such as atomic force microscopy, focused ion beam microscopy, and synchrotron X-ray scanning of minute fossils (and the latter will improve when the Swedish synchrotron facility is opened).

**Networks and collaborations**

All Uppsala palaeontologists collaborate well with each other, with other colleagues in Uppsala (both in Earth Sciences and in Biology), and with colleagues worldwide. Their involvement in the EU Zootaxa programme has been important in bringing wider collaborators and two funded PhD students, and current attempts to renew this strong collaborative programme are promising, which brings together palaeobiological, genomic, and developmental biology laboratories throughout Europe, and especially provide unique cross-disciplinary training for PhD students.

**Opportunities for renewal and emerging science**

Great steps have been made since 2007 in consolidating and extending the work on origins of Metazoa and on Neoproterozoic life, and we encourage continuing focus on the difficult cross-over area between palaeontology of exceptionally preserved fossils and evolutionary genomics and evo-devo approaches. We identify these key existing and emerging themes:

- Origin of metazoan body plans.
- Neoproterozoic microfossils and the ‘Snowball Earth’ model.
- Molecular genetics and development of form.
- Origin of novelties and their role in driving the diversification of life.
- The Cambrian Explosion, timing and meaning.
- Biotic and abiotic drivers of evolution, including climate change.

**Actions for successful development**

We encourage further integration between the Cambrian macrofossil and Precambrian microfossil work, retaining the focus on using novel technologies for extracting new morphological information from exceptionally preserved fossils. The opportunities of new kinds of microscopy, including micron-scale 3-D synchrotron imaging, are being exploited increasingly in the micropalaeontolo-
gy section, and might offer great opportunities for the study of Neoproterozoic and Cambrian animal fossils.

We encourage further work in applying new insights about the timing of evolution of Chlorophyceae and other Precambrian microfossils to current debates about the accuracy of dating of deep branches in the molecular tree of life.

Make sure the exceptional Palaeobiology programme, the smallest in the department, retains and builds its activity level by replacing the Professor of Historical Geology and Palaeontology when he retires in 2012.

Ensure continuity in the Neoproterozoic microfossil work when the current professor retires, by appointment of a permanent junior position to shadow and take over this research.

Solid Earth Geology

The Solid Earth Geology Group includes several integrated research fields, and there has been considerable restructuring since the KoF07-report, with some retirements and some new appointments. The activities of the group were presented as research in the two general areas of Tectonics and Geodynamics, and Mineralogy and Petrology, though there is overlap and interaction between the groups and with the activities in the general area of Geophysics. In terms of funding, personnel and publications, the group has recovered from a difficult time prior to 2007 to achieve a position of relative stability and enhanced output. This group’s activity is central to maintaining an effective breadth in Earth Sciences and they have much to offer. The group is rooted in experimental and field observations, and we were struck by their realism. Sweden is a relatively small country and it is unrealistic to expect expensive state-of-the-art facilities (for example, in isotopic geochemistry) to be available everywhere in-house. With this in mind, the group has increased its effectiveness through well-chosen national and international collaboration. Nonetheless, a basic level of in-house experimental facility is essential and stood out as a recurrent and persistent limitation in this area of research, partly because the reduction of technical help has reached levels that would make the whole enterprise unsustainable in mainstream Earth Science departments elsewhere. It is remarkable what the group as a whole has achieved in such difficult circumstances, and it is clear that any investment in technical personnel to ease the situation would yield disproportionate rewards.

Tectonics and Geodynamics

General assessment of the unit
The activities of a relatively small number of people (1 professor, 1 lecturer,
1 assistant professor, 1 postdoc, and 3 PhD students) were presented under this subject area, which could arguably have included also the activity in various areas of earthquake seismology (which was described under Geophysics). The range of research was very broad, including: mantle convection; GPS-based studies of post-glacial faults in Sweden; analogue and numerical modelling of geological structures that included faulting, folding and salt tectonics; and geochronological, isotopic and metamorphic studies of shear zones in the Scandinavian shield. This is a wide range for a small group to cover, and much of it is done in collaboration with international and Swedish partners, particularly where specialist analytical equipment or software is required. A particular in-house expertise is analogue structural modelling.

Quality of research
The group publishes steadily, with the analogue structural modelling, in particular, producing the bulk of the output in quality journals such as *Journal of Structural Geology* and *Geophysical Journal International*. In that sense, the quality of the work is clearly at least internationally recognized, and some of it is internationally high standard. As far as the analogue modelling is concerned, the group has certainly been an important and thoughtful player for some time, though it is harder to gauge the general impact of this rather specialized research on the broader field of tectonics. We suspect it may have special attraction and relevance to the oil industry, though we were not presented with particular case studies to demonstrate this.

Research environment and infrastructure
The presentation stressed the dual importance of laboratory and field work, which was substantiated by the studies discussed, several of which were initiated by either geophysical (usually seismic reflection) or field investigations that led to analogue or numerical experiments. The group seemed to have access to the necessary techniques and equipment, sometimes through external collaboration. However, much of their energy and time is taken up in maintaining and preparing equipment in what is predominantly an experimental in-house operation. Some technical help would ease the situation, though how this resource should be funded is not clear to the panel.

Networks and collaborations
This seemed to be effective, both internationally and with industry, and an important part of the group’s ability to be engaged across its broad spectrum of activities.

Opportunities for renewal and emerging science
In this area of science many of the opportunities to advance understanding and achieve impact arise through events (e.g., earthquakes) or the exploitation of new technology (e.g., various forms of satellite-based remote sensing). It is
unclear how this rather small group is positioned to take advantage of such developments, except through energetic external collaboration, which may be the most sensible and practical strategy.

*Actions for successful development*

If there is one thing the committee thought was lacking or unclear, it was the articulation of any clear strategy that guided the energies and research targets of this programme. No-one can do everything, and this group is involved in a broad and ambitious set of activities that have no obvious agenda, though they are of high quality. Some focus and conscious targeting may increase their international academic impact; alternatively they could quite reasonably decide to pursue a more applied agenda aimed at increasing support and intellectual stimulation from the oil industry. They could excel in either direction. Their main strength, reflected in their highest-profile publications, is in structural geology. There is clearly potential for increasing their international recognition by better articulating their strategy and aims.

**Mineralogy and Petrology**

*General assessment of the unit*

The general area of igneous and magmatic petrology has been revitalized since 2007 by the appointment of an energetic and imaginative new professor, who leads a small group (1 professor, 1 lecturer, 1 assistant professor, 2 postdocs and 3 PhD students). The future outlook has been further improved by securing the renewal of a vital electron microprobe instrument that will greatly enhance their activities. This is a competitive, busy, expensive and technology-led international research area, in which the group has consciously decided to make their mark by applying their petrological expertise to questions of environmental, economic and societal importance. This is a bold and admirably clear strategy, the outcome of which will take a few years to become apparent.

A separate effort, led by a single professor and PhD student, continues the tradition at Uppsala of experimental work on the physical properties of minerals at high temperature and pressure. A particular focus concerns the link between such physical properties and processes in the deep mantle and core. We were told of the intention to link experimental mineralogy and petrology in the future, and such intellectual collaboration is likely to be fruitful.

*Quality of research*

Both the igneous petrology and mineralogy researchers have a respectable published output in mainstream international journals. It is perhaps too early to gauge the impact of the conscious effort to target environmental, economic and societal questions by the petrologists. The experimental mineralogy work was difficult for the committee to ascertain, being in a specialist field outside their
expertise. The work of both groups was recognized to include a mix of internationally recognized and internationally high standard work, and is probably on a rising trajectory, especially for Petrology.

**Research environment and infrastructure**
Both groups have a certain amount of equipment and expertise in-house, which they then enhance by external collaboration or making use of facilities elsewhere, often internationally. Indeed, the committee was impressed by how much they had achieved in areas where progress is dependent on specialist measurements, which they have managed to obtain with remarkably little dedicated technical assistance. The electron microprobe is an impressive and very important state-of-the-art facility, unique in Scandinavia and with very wide potential application in a range of academic subjects that extends significantly outside Earth Sciences as well as in industry. Its effective exploitation is limited by the need to fund its dedicated technician through contract work.

**Networks and collaborations**
For both groups, collaboration is clearly essential in order to make measurements that would otherwise be impossible to obtain. Such collaboration is both international and within Sweden, and is pursued sensibly and energetically. It is the only realistic option available to increase and maintain the range of their research activities.

**Opportunities for renewal and emerging science**
For the petrologists’ declared strategy, new opportunities will arise through events (eruptions, landslides), and some thought is needed to anticipate how to respond. They already have strong international networks, both locally on the ground in volcanically active areas and with other international researchers. An important part of the future experimental mineralogical strategy is to take advantage of the future Swedish synchrotron facility. We also note the intention for future collaboration between experimental mineralogy and petrology.

**Actions for successful development**
The committee was a little worried at the sheer range (both intellectual and geographical) and number of collaborative international projects the petrology group was involved in. Certainly they are putting their energies where their declared strategy lies. Only they can judge whether this is realistic, whether the senior leadership can keep quality control over such a range simultaneously, and whether they can deliver high-quality research in all those areas. Some conscious prioritization or targeting may become necessary in the future if quality is not to slip, and planning for such a contingency is probably sensible. The case for upgrading the funding of the microprobe technician from 50% to full-time is very strong: this is a major facility that could (and should) be used to its maximum effective extent in research. As it would certainly be used by groups
all over Sweden, in Earth Sciences and in other subjects, as well as by industry, the case for putting it on a secure business plan is pressing and would ensure an increase in the department’s research profile.

Geophysics

Uppsala solid earth geophysicists are concerned with diverse problems of national and international significance. For a relatively small number of researchers they are involved in a very broad spectrum of research activities using a wide range of techniques. They are organised in four groups for administrative purposes: (i) Earthquake Seismology, (ii) Geodynamic Modelling, (iii) Applied Geophysics, and (iv) Airborne Geophysics.

These four groups, each headed by a professor, fall into two broadly related larger programmes; Earthquake seismology and geodynamics (groups i and ii) and Applied geophysics (groups iii and iv). The permanent staff consists of three professors (one to retire in 2012), one senior professor, one visiting professor, six other staff, four technicians, three postdocs, 20 PhD students, and 10–20 MSc students. The associated Swedish National Seismic Network (SNSN) is staffed by two researchers and 3.5 research engineers. The SNSN consists of 63 broadband stations, put together over several years, and represents a total investment of € 3 million. It has had patchy support, but now receives SEK 5 million per year. The SNSN is perhaps the most active scientific entity in the Swedish media.

Internal income is SEK 14 million (of which 5 million is for SNSN), and external income is also about SEK 14 million, representing some 50% of the budget, a notably high figure.

Collectively, the geophysicists take in 10–20 Masters and PhD students each year, and they all follow a graduate-level taught course. Masters students attend 60 credit points of the course, PhD students 40 credit points, according to their backgrounds (a mix of geologists, physicists, and mining engineering).

It is clear from the large number of joint publications that researchers in the various groups work together and that the administrative grouping is not a barrier to cooperative research among the geophysicists. The majority of the groups’ publications appear in the best earth science journals. For seismologists and applied geophysicists, their publication records and citation counts are very good.

Earthquake Seismology and Geodynamic Modelling

General assessment of the units
The SNSN is a splendid facility that is now operated through Uppsala Uni-
University. It is running well and managed professionally, and now represents a substantial resource and research opportunity that is probably under-used or at least under-exploited (see below). It certainly offers the chance to raise Uppsala’s international research reputation and profile far higher than is currently afforded by its justification as a facility for ‘public information’.

The committee was also told of a few seismological research projects, some of which involve the SNSN (or its equivalent in Iceland to which the group has access) and others that are based on data from elsewhere. Various other projects in the general area of geodynamic modelling were also based to some extent on seismological data (e.g., tomography, subduction zone coupling), whereas others involved GPS or rheological modelling (e.g., post-glacial isostatic adjustment).

Quality of research
The group maintains a steady and respectable publication output in the leading academic journals. It is perhaps too early to gauge the longer-term impact and quality of research associated with the SNSN as it has been evolving and only recently become fully operational and accessible. Many of the geodynamical modelling projects are in mainstream areas that are fiercely competitive and fast-moving in the international arena, such as body-wave and surface-wave tomography, subduction-zone coupling, the mapping of mantle velocity anomalies into temperature, the controls of crust and mantle rheology, and dynamic earthquake rupture processes. This shows an admirable level of engagement in scientific problems of international stature, but comes with some risks: it is important that some help is given to the younger and less experienced researchers involved, to ensure they have a full grasp of the relevant data and its limitations, and of the international competition they face. There is a clear mentoring and supervising role here for the more senior members of the group, whom we urge to examine these issues carefully. We identify a mix of internationally recognized and internationally high standard quality classes in this area.

Research environment and infrastructure
Most of the activities described to us require only computing facilities and access to data. There is no reason to doubt these are a problem.

Networks and collaborations
At an operational level, the earthquake seismology group is well connected to a number of international networks sharing data with neighbouring countries in Scandinavia and is a member of the Observatories and Research Facilities of European Seismology (ORFEUS). The committee was nervous that work on some of the seismological and geodynamical projects may be proceeding without a full awareness of the international competition and background, and possibly without adequate recognition of the limitations imposed by data and techniques. This is a potential hazard for anyone concerned in mainstream com-
petitive international research areas, especially for younger staff, and can be addressed through mentoring and a conscious effort to engage with the international community, particularly through presence at major international meetings.

Opportunities for renewal and emerging science
The SNSN represents a huge opportunity for Swedish seismology. When the time is right, the committee hopes that, following the example of the USA (e.g., the Earthscope project), all the data will eventually go on the web with open access. This would ensure (a) that everyone would use it, (b) that quality-control would be assured, as users would notify the operators about faulty calibrations and performance, (c) its probable continuity as an essential international resource, and (d) an enormous amount of goodwill and intellectual support from the international community. The USA and NSF measure the success of such projects by how many people use the data, which in turn ensures the projects’ continuity. Here is a real chance for Sweden to break the European tradition of jealously guarding and restricting data, and of showing the true potential of open international cooperation. The goodwill alone triggered by this action would ensure that Swedish earthquake seismologists would always be in demand as international collaborators.

Actions for successful development
The committee encourages the group to nurture, and possibly to increase, their engagement with the mainstream international seismologists and tectonic geologists who drive the international agenda in many of the areas they have chosen for their seismology- and geophysics-based geodynamical projects.

Applied Geophysics

General assessment of the units
The applied geophysics group has a strong research focus on controlled-source seismology for structural studies of the upper crust and development of 2D and 3D algorithms for first-break tomography. High quality, high resolution reflection seismic data have been acquired in potential hard-rock nuclear waste storage sites in Sweden and Finland, as well as the North German basin as part of the EU-funded carbon capture and storage (CCS) program, and for studying larger scale structures in the mineral-rich parts of Northern Sweden.

Electromagnetic geophysics research is partly directed to studying the electrical properties of the deep continental lithosphere in the Baltic Shield and partly related to the application of electromagnetic methodologies to studying the shallow accessible part of the crust. The group has developed a new broadband airborne RadioMagnetotelluric system which will enable much improved lateral and depth resolution.
Quality of research
The seismic activities of the group are setting new standards for high-resolution 4D images of the crystalline crust. Results of this work have had an enormous influence on the interpretation of seismic reflections in the continental crystalline crust, and are pivotal in the planning of ambitious and expensive deep drilling projects. The professor leading the seismic reflection group has been the initiator of the recently established Swedish Deep Drilling Project and a number of invitations to participate in international projects testify to the global reputation of the group.

The research of the electromagnetic group is known for adopting unique and novel approaches for resolving problems in airborne geophysical techniques which have been essential for mapping basement rocks in Sweden. The tensor VLF system has been employed for this purpose on helicopters, zeppelins and has potential for unmanned flight applications, and has been used successfully in Sweden.

Both the seismic and electromagnetic groups maintain high profiles and steady outputs in the appropriate professional journals, and the research activities of both groups are rated as top-quality.

Research environment and infrastructure
The applied geophysics group has a remarkable infrastructure for conducting top-quality research. The seismic reflection group has not only a very modern data-recording system for multi-coverage profiles at hand but has also built new controlled-source systems for generating repeatable seismic signals. The electromagnetic group enthusiastically designs and develops innovative equipment for airborne measurements.

Networks and collaborations
The group is part of a number of national and international networks. The leadership in the Swedish Deep Drilling Project and the participation in the ICDP are outstanding examples.

Opportunities for renewal and emerging science
Both groups are well placed for active and essential participation in the various strategic research agendas that are likely to be a focus of government and industry funded projects in the coming few years, concerned especially with Mineral Resources, Energy, and Waste Disposal issues.

Actions for successful development
Since airborne geophysics plays a key role in the applied geophysics group the evaluation panel strongly recommends that the department create an appropriate professorship in applied geophysics after the current Professor of Electromagnetic Geophysics retires in March 2012.
Other issues

**MSc, Graduate and Postdoctoral programmes.** – It was noted that the Bologna agreement has just recently been applied in the Earth Sciences and the related physics MSc Programmes in Meteorology and Geophysics. As such there was a surprisingly large variation in the number of MSc students guided by the various research groups. It is recommended to fully integrate the thesis work by the MSc students as part of the research of the groups. In addition, we recommend that the department should initiate a discussion about the extent to which the current MSc Programmes in Meteorology and Geophysics can be integrated within Earth Sciences and as such giving a wider exposure to, and recognition of the Earth (and related Environmental) Sciences.

Recruitment of PhD students has increased from 7 in 2007 to 20 in 2010, and the ratio of female students has moved from 15% to 50%. Much of the increase in numbers has been in Geophysics (7 to 17 in total). The total population has increased from 47 in 2006 to 62 in 2010. Doctoral students are appointed for a 4-year funded position, with their payments variously based on stipends and salaries, from university and external grant funds. The programme leaders spend a considerable amount of time selecting PhD candidates, about half from Uppsala undergraduate programmes, and half from elsewhere. If a student is not progressing well, s/he can be encouraged to write up a Licentiate thesis, at the end of 2 years, and perhaps to leave at that point. One problem highlighted was that the responsibility of the supervisor and the department to guarantee a funded post for 4 years means it is hard to remove a student who is not motivated or performing well. This can be a big risk if the investment in the student is not returned in terms of publishable results. PhD projects may not progress because of problems with the topic or supervision, or from the student’s enthusiasm and hard work. It might be helpful to consider a model of progress monitoring, with more extensive review of progress each year: if there is no success, the project could then be terminated, and the funds redirected to another student and project.

In terms of planning and progression, processes appear to be strong and the students understand and appreciate them. Students prepare an individual study plan, which is a 10-page document, prepared with the advisory group (supervisor and co-supervisor). The annual evaluation is a brief event, lasting about 15 minutes, during which the student gives a presentation, and there is discussion of any revisions to the study plan. If the project is not working, the topic can change by discussion with the supervisor, and discussions among the involved academics. Further, students can change supervisors if the theme does not work out.

Training and career development also appear to be of the highest standard. Students are encouraged to give talks at national and international conferences, and funding is available for travel to those conferences, and most of the students do give talks. Further, all students are writing papers, and expect to write sev-
eral papers to form the bulk of the thesis. Students attend PhD-level courses in Uppsala, Stockholm, and elsewhere, some being subject-specific, and others on career development and general themes (science ethics, how to write papers, pedagogic training). Some students take teaching assistant positions (20% positions) for supervising laboratory and field classes, as well as to deliver some lectures. Towards the end of the PhD, the university offers a ‘PhD exit’ course of three days about how to finish and submit the thesis, how to apply for postdocs, and this was well regarded.

**Postdocs and research fellows.** – There are large numbers of young, contract researchers in the department, equivalent to postdocs and research fellows. Many have been funded through the ‘forskarassistent’ positions, and the young researchers pointed out as positive features the four-year duration, and the possibility of supervising a PhD student, but a negative aspect is that the positions come with very little funding for actual research costs, and so the candidates have to hunt for grant funding immediately.

A two-stage system is being discussed, starting with a 2-year postdoctoral position followed by a junior fellow position that may become tenure-track. In developing the new model, it is important to make sure that the more senior positions have enhanced prestige and adequate funding. In many other European countries, there are prestigious senior fellowships that provide support for five years, with adequate research costs (say € 5–10 thousand per year to cover conference attendance, purchase of a computer, modest laboratory or field costs), and the new Swedish model might seek to emulate the best of such schemes.

The Division for Development of Teaching and Learning (PU) offers training courses in how to teach and how to supervise PhD students – these were generally felt to be helpful. Many research fellows are expected to teach for 15% of their time, which is generally felt to be helpful practice for a future academic career.

**Special focused, thematic research programmes**

The panel was given presentations on the department’s vision for its participation in three broad research themes, Natural Resources, Natural Disasters, and Energy, which have obvious strategic importance at national level and are of great public interest. We were struck by how much the department had to offer, and by its clear self-realization that the reason it could contribute substantially was because of its deep and broad understanding of how the planet works. The presentations did not make unrealistic claims, but instead showed a balanced awareness of what was achievable and relevant, and what would make their participation effective. As far as interaction with industry was concerned, they showed a clear awareness of the difference between a routine consulting role and a much more rewarding intellectual role in driving forward the method-
ologies, techniques or imaging capabilities that make a substantial difference to what industry can achieve. All three themes have histories in which major advances have arisen through cross-fertilization between different branches of Earth Sciences; a route to success that is only possible if a broad holistic approach to understanding the Earth is maintained. This is the department’s principal characteristic and strength, and one that is wholeheartedly endorsed by the panel.

Natural Resources. – Natural resources comprises two aspects, mineral resources and water resources. Mineral resources deals with basic research in solid earth geology and geophysics with the aim of developing methodologies for more efficiently identifying future reserves of ‘standard’ metals as well as recovering rare and high-tech metals. The research in the renewable resources, water and air, will focus on water recycling, i.e. both how climate (and climate change) influences water quality and quantity and how the feedback of water, energy and solutes from the land surface to atmosphere affects the Baltic region.

Natural resources is an obvious theme in a country like Sweden that has a unique wealth in mineral resources and a major mining industry dating back 1000 years. In addition, Sweden has unique water quality problems and faces significant climate change impacts on water resources, for which predictions can presently only be made with large uncertainties. While the societal challenges are obvious and the department’s scientific background is excellent for this research, the two themes as presented to the panel were not linked, but were apparently envisaged as two more-or-less independent topics that build on the strengths of two established programmes. The department could develop stronger links between these two components.

Natural Disaster Science. – The research in natural disaster science will take place within a new Centre for Natural Disaster Science (CNDS) combining staff in different departments at Uppsala University, including Earth Sciences, the National Defence College and Karlstad University. The CNDS has received funding of some SEK 24 million per year up to 2014 from different agencies, and this may continue if the unit is judged successful. The funding supports three research associates, four postdocs, and 22 PhD positions, and some 25–30% of the funding comes to Earth Sciences.

Natural disasters result from the intersection of a natural hazard with human settlement. The CNDS will initially focus on risks and early warning systems for geological and hydrological hazards. Research on the geological hazards will include volcanology and seismology using the Katla volcano in Iceland as a case study. The hydrological research will focus on risks related to floods and droughts, including ecosystem services and drinking water security in Sweden, but also worldwide. An important aspect of CNDS is the creation of a new multi-disciplinary Swedish research school that will be complementary to the existing activities.
The Department of Earth Sciences has an excellent background for carrying out research on natural disasters. Through the interdisciplinary cooperation with research groups outside the department, including risk aspects, it appears to be possible to integrate research on geological and hydrological hazards into a coherent programme. Altogether the CNDS has the potential for creating novel multidisciplinary research with major earth science contributions.

Energy. – There are many earth sciences inputs to energy use, including fossil fuels, nuclear energy and disposal, and renewable resources (wind/water). However, some constraints are political in that funding and permissions follow political agendas. Uppsala University has received funding for the STandUP for Energy (SEK 52 million) and InnoEnergy, a major European initiative at € 150 million per year. At present the Department of Earth Sciences has a modest engagement with these big initiatives largely because of the small staff numbers and inability to find the time to prepare bids – this may become more achievable in future, as Uppsala University has appointed eight EU project coordinators to help drive such bids.

The department has involvement with wind energy, fossil fuels, biochar, and CCS (carbon capture and storage). The EU has a definite road map to CCS, with industry/technical and research aspects, running to implementation by industry in 2020. The EU-funded MUSTANG project is the largest geology-based component of current research, and this project is coordinated from Uppsala University. There are practical, industry-related issues, but the key drivers are scientific: improving models for CO2 spreading, trapping, and related phenomena, and linking the models to experiments in the laboratory and in the field. The geophysics researchers will also be involved in developing and improving seismic methods for monitoring CO2 below ground. There are opportunities for Swedish and international funding to continue the broad-scale studies, as well as more specific regional studies of likely carbon disposal sites in the Baltic and North Sea.

There is a keen interest in wind energy, in particular in themes such as wind resource, sound propagation, wakes, and wind turbine load. These help to optimize the siting of turbines in terms of wind resource and impacts on society. These themes are now being developed thanks to external funding in 2010 for three PhD students.

Research on fossil fuels includes sedimentary basin modelling and porosity studies, structural complexities of potential oil fields especially salt domes in the Middle East, deep oil resources that lie below igneous rock bodies, and Arctic resources and tectonics of the Urals. Some of these themes are ‘conventional’ for the oil industry, whereas the deep-seated investigations using isotopic work coupled with geophysics to predict deep resources below crystalline rocks, are novel.
Global Energy Systems Group in the Department of Physics and Astronomy

[Also evaluated by the Physics panel, see page 292.]

The panel was asked to comment on the possible future situation of the Global Energy Systems Group (GESG), currently in the Department of Physics and Astronomy. We met Professor Aleklett and colleagues, and discussed the situation with the Dean of Physics and Vice-rector Professor Joseph Nordgren. We comment first on research quality, and then on some possible future scenarios.

Research quality
Using the formal Uppsala rating system, we assess the recent work of the GESG as a mix of top-quality, internationally high quality, and internationally recognized work. This especially reflects the series of 23 papers published in international highly ranked research journals, which are beginning to attract good citation numbers.

Practical plans
We identify several key issues:

- We understand that the GESG has always been seen as an unusual subject theme to be housed within Physics, and Physics would not contest a move.
- The quality of the work is high, to very high, and so it would represent a substantial loss to Uppsala University if the programme were terminated.
- Further, the theme is of immediate societal, political, and economic importance, and well-researched, authoritative evidence from research groups such as the GESG is valued by the world, and will continue to bring great attention to Uppsala University.
- The panel identified the controversial nature of some of the findings of the GESG, but they felt it is very likely that the GESG point of view is correct, and that a distinguished university of long standing is a perfect home for well-informed, academically sound researchers who occasionally annoy senior politicians and business people. As Lord Luce said in London in May, 2011, ‘It was the job of an independent university not to be afraid to annoy people’, and similar views have been expressed down the centuries by Aristotle, Bacon, and Newman.
- The GESG appears to earn a quarter of its money (c. SEK 600,000) from teaching, a quarter from Uppsala University as general support, and a half (c. SEK 1.2 million) from external sources including industry.
- The Department of Earth Sciences is happy to consider housing the GESG unit, and they might recommend a way forward would be to ally the group with researchers in earth sciences who are already involved in the wider Energy theme, perhaps as part of the STandUP initiative. Further, the teach-
ing currently offered by the GESG unit might work well with teaching offered by the Centre for Sustainable Development in Earth Sciences.

- The forthcoming retirement of the Director of GESG offers an opportunity, if the unit is retained at Uppsala University, of strengthening the theme by appointment of a new chair, and retention of the existing junior researchers, and recruitment of a few further members of the team.

- The panel notes that the GESG could be located either in a science or a social science/business/economics department – in some universities the latter option might seem better, because the group might be less likely to be squeezed out by big-money science, and could generate higher impact.
Scope of the panel’s evaluation:
Department of Engineering Sciences

Department of Engineering Sciences

Executive summary
The panel’s overall impression is that this is an extremely vibrant and dynamic department established around important engineering disciplines.

On average the rating for all divisions is top-quality or of high international standard having output as follows:
- About 20 PhD dissertations annually.
- More than 200 peer-reviewed articles are published annually.
- According to self evaluation, bibliometric analysis shows 35% higher impact than world citation average in the field.
- High participation in national and international centers and networks of excellence.

Approach established to address KoF07:
- Staff renewal through young and dynamic professors.
- Several “traditional” but under-critical activities have been discontinued.
- Increased cooperation between divisions and participation in newly established “centers”.

Key issues identified in the KoF11 assessment:
- Funding and changes needed from the current structure that will allow further renewal.
- There is evidence of increased collaboration between the divisions compared to the last assessment. This collaboration should be nurtured as it will allow enhanced capacity building and establishing the needed critical mass in areas that need strengthening.

For renewal:
- Further promotion of spin-off companies, motivation of PhD students for entrepreneurship.
- Need to look at expanding staff and research areas into the areas of fundamental and blue sky research that underpin the application areas, i.e., more disruptive thinking!
Summary of the Department of Engineering Sciences

Staff. – Totals: 106 academic staff (PhD-students excluded), 18 research engineers, 12 administrators. Academic staff: 28 professors, 17 senior lecturers, 50 researchers, 4 research associates, 132 PhD students, 7 lecturers


Funding and scientific output last 4 years. – SEK 156 million faculty funding (last 3y), SEK 471 million external funding, 806 refereed publications, 735 conference contributions, 58 PhDs completed, 38 “Licenciat” completed

Companies started in last 10 years. – Adamantis AB, ÅAC Microtec, Chromogenics AB, Dirac research AB, JonDeTech AB, NanoSpace AB, Nova Diamant AB, Primateria AB, Rotundus AB, Rolling Optics AB, Seabased AB, Solibro AB, Vertical Wind AB, Energy Potential, Current Power Sweden AB, Integrated Antennas AB, NanoLogica AB, Wisenet Holding AB, Gradientech, Molecular Fingerprint Sweden, BactInact AB.

Summary of the strategic discussions concerning the Department of Engineering Sciences held by the panel

It is important for the university to take note of the areas of research brought in by this department and to provide the necessary platform for them to gain visibility and coherence both from a teaching and research perspective. The panel has discussed and probed the wishes of the department of the possibility of forming a specific Faculty that will contain all the elements of it research and teaching portfolios. The panel is of the opinion that a formation of a separate Faculty will be the best approach to allow the divisions to expand their activities, create further collaboration, and most importantly provide the “Uppsala engineering window” with a high national and international visibility which seems to be missing when compared to other Swedish universities. The panel clearly recognizes the wish by the department to be an autonomous Faculty and will therefore endorse this request. However, there are also other avenues that can be investigated and explored for enhancing the visibility of the department – such as professional marketing and advertisement of the high standing research and education being carried out by the department.

Furthermore, the panel recommends enhancing and developing collaboration with the science departments of Uppsala University as this provides a good platform for linkage in research and development. Most importantly this will
also increase the “scientific visibility” of the department through joint publications in high-impact journals, an issue which in our view has not been fully exploited by several of the divisions.

The panel feels that the above strategies should be seriously considered by the university in the short term.

Assessment of the individual divisions in the Department of Engineering Sciences

Introductory remark. – Due to the broad and very different fields of research in the Engineering Department the panel decided to assess the research per division. This is done according to the structure of the department in effect until Dec. 31, 2010 in order to facilitate comparison with KoF07. It will be indicated, where organizational changes have become effective after Jan. 1, 2011. The sequence of the divisions reported here corresponds to the sequence of the presentations given at the site visits. Findings and conclusions concerning the department as a whole will be given at the end of this report.

Solid State Electronics

Statistical data
4 professors, 14 researchers, 18 PhD students, 10 PhDs completed last 4 years, 104 publications last 4 years, 7/18 MSEK/year average internal/external funding.

General assessment of the unit
The division is concentrated on four main activities (i) solid state solar cells, (ii) thin films, (iii) electronics devices, and (iv) emerging devices. The recent hiring of a new division head with a strong international track record is considered very positive. The research can be considered as multi-disciplinary, covering a variety of different topics.

Quality of research
The research work is of internationally high standard, especially the CIGS work on solar cells; the work on flexible electronics, which is complementary to the approach taken by other groups; modelling of plasma deposition processes; energy efficient RF components; and the work on carbon nano tubes.

Research environment and infrastructure
The composition of the research team with 6 professors and 15 PhD students is well balanced. Some of the new senior members will ensure the introduction
of additional important and relevant research topics. There is good interaction with other divisions and centers and for research topics the link with KTH will be intensified. The division has a strong potential to become actively involved in two of the EU Flagship projects. Use is made of the internal processing facilities, although some of the more advanced device work will have to be pursued externally due to the limitation of the existing process facilities, not enabling state-of-the-art processing. The cycle time of the internal Uppsala University facility is sometimes too long, delaying in some cases the progress of the research work.

The research work on CIGS is of excellent quality. This work includes the use of an ALD buffer layer and modelling growth and the interdiffusion of Cu and In. However, there is some doubt from the panel on the intention to initiate work on silicon solar cells as this topic is highly competitive and work is already carried out at different places. The panel is not sure to what extent the group will be able to go beyond the existing state-of-the-art in view of the intense competition.

As a new activity ‘emerging electronics’ has been started under supervision of the new chair professor. The goals are set in flexible and stretchable electronics solutions for ubiquitous needs in smart life applications. Core research topics are aiming at high-speed electronic circuits based on carbon nanotubes (CNTs) and graphene materials. The selection is based on strengths of the professor and is in-line with the division goals and university strategy. Flexible and printed electronics is expected to become a huge 100 BUSD market in 10–20 years. As recommendation: concentrate building on own strengths and potentially collaborating with other Uppsala University groups on multidisciplinary technology combinations to come to low-cost diagnostics and sensing applications. The panel is recommending a non-overlapping orientation in the national landscape and collaborations with Acreo and Linköping University groups in organic and printed electronics and with KTH in iPack flexible electronics activities.

High quality work has also been done related to Si on SiC hybrid substrates on 150 mm wafers, based on the bonding approach. This is important for future wafer integration with III-V materials.

Based on the background expertise of the division head and the strong background of the division in sputtering, there is a strong potential for initiating research activities on sputtering-based salicides. This is an important topic with a broad international interest and a good potential for high-quality publications. It is also important to mention the activities concerning bio-sensing based on nanowires.

Although the number of publications is good, the division has the intention to publish more in journals that are most represented in their respective fields, such as IEEE journals, which have a good impact factor and a higher relevance for several of the main topics studied within the division. This will have a positive influence on the visibility of the activities towards other research groups in the field.

Part III: Panel Reports

Panel 17
The division has good experience with start-ups and one of the spin-off companies on solar cells is now part of Q-cells, a large German company and one of the leaders in the field. The development of a blood sensor also resulted in a spin-off company.

The recommendations of KoF07 have been taken into account. In this aspect the formation of a Diamond Centre has to be mentioned. Some comments on the centre itself will be given in another section. Also the recommendation on bio-sensing has been taken into account.

Microwave Engineering (now with Solid State Electronics division)

Statistical data
1 professor, 2 researchers, 3 PhD students, 1 PhD completed last 2 years, 10 publications last 2 years, 1/5 MSEK/year average internal/external funding.

General assessment of the unit
The level of the research performed seems to currently lie between internationally recognized and high international standard. The engineering aspects are currently stronger than the “pure science” aspects. Gender balance is currently very good (F 45% – M 55%). The division has significant interdisciplinary activities as a part of its current portfolio. Synergies with other activities are expected to increase further as a result of the integration into the Solid State Electronics division.

Quality of research
The research performed seems in general to be of an at least internationally recognized, or even of a high international standard in some of the topics. The latter holds in particular if one emphasizes the engineering aspects more than the “pure science” aspects, as the research currently seems quite application-driven. The particular strength of the division seems to lie on integrating new electronic devices into complete systems, in particular novel wireless interfaces. Sensor technologies/networks and stretchable electronics are also very interesting directions with huge potential. The publication and citation record is steadily increasing and is more than respectable. The number of grants from various quite competitive sources of funding (SSF, EU 7FP, Vinnova, VR) has also been high over the last few years, indicating that the division is indeed competitive with regard to the quality of its research proposals. Currently the division participates in three EU projects.

Research environment and infrastructure
The division chair has a most respectable CV and experience in terms of aca-
ademic achievements (publications, citations, PhD production, grants received, international network), and in terms of interaction with industry and society. However, given that he has been the only senior in the division for the past few years, it seems that the division has not had the critical mass needed to fully exploit neither the scientific potential nor the innovation potential in the broad and important topics it is responsible for. This is also rightfully pointed out in the division’s self-evaluation; more faculty funding should be awarded combined with more aggressive actions for external funding for personnel in order to realize the intrinsic potential. The division has not mentioned any perceived weaknesses in research infrastructure, so the panel thus has reason to believe that this is on an adequate level.

Networks and collaborations
The division is internationally well-connected through active participation in several EU consortia and COST actions. National networking and cross-disciplinary activity level is good both towards industry and in terms of internal collaboration across divisions and even across departments and faculties. The division has been given a responsibility for developing microwave components for the RF chain in the prestigious intergovernmental ESS project; if exploited properly, this could give significant strategic momentum to the division’s visibility and reputation in a European perspective.

Opportunities for renewal and emerging science
The recent decision to integrate this division into the Solid State Electronics division presents potential opportunities for renewal, by a tighter integration of the research topics between the two former divisions. It presents in particular the opportunity to put more critical mass, in terms of personnel, on some of the topics currently pursued by the group. From the documentation given to the panel there does not currently seem to be any immediate plans of an expansion of the faculty funding to the microwave engineering activities. However, the panel believes there is a strategic opportunity here, in consolidating faculty resources towards the three main research directions pointed out by the division in its self-evaluation. This would enable the microwave activities to achieve a more long-term perspective and thus to realize the personnel’s potential for scientific excellence.

Actions for successful development
The recent decision to integrate this division with the Solid State Electronics division, under the heading of the latter, seems to be a wise move. The microwave activities, with their emphasis on novel hardware solutions, are clearly much more aligned with the activities in the Solid State Electronics division than they were with the Signals & Systems activities. As pointed out already the division seems to have been of somewhat under critical size in its incarnation until 2011, in particular given its quite ambitious goals and responsibilities; this
is seemingly rectified through the integration, and there should be ample room for interesting synergies within the new organizational structure.

The division, in its self-evaluation, indicates that there currently is not a high enough percentage of curiosity-driven long-term research in its project portfolio, and that this might be rectified by a higher level of faculty funding. This is in line with the panel’s impression that the division has been of under critical size compared to its range of activities in recent years. It is therefore recommended that the microwave engineering activities within the new organization are consolidated around fewer and more long-term scientific goals than what has been the case during recent years. It would be advisable for the expanded division to allocate faculty resources in a strategic way in order to achieve this.

Effects of the KoF07-evaluation
This division was not evaluated by the Engineering Sciences Panel in KoF07. It was until quite recently a part of the Signals & Systems Division, which in 2007 was evaluated by the Information Technology Panel. However, the microwave activities were not explicitly mentioned in the report by this panel and neither were there any recommendations about future measures for this area. Thus it is hard for the present panel to comment here.

Other issues
The interaction with society, and the relevance of the research, seems to be on a very good level. A spin-off company was created in 2007 based on research from the division. There have been 3 patents in the last 10 years. The overall strong level of funding from a large variety of external sources (50 to 90 % external funding for each of the current division members), both national or international, serves to emphasize the good impression. Industrial interest in the division’s research, including the proposed key areas for future research, also seems quite high. Doctoral training seems to be of very respectable quality; however, one might perhaps have expected a slightly higher productivity than 7 PhDs in the last 12 years.

Solid State Physics

Statistical data
7 professors, 4 researchers, 15 PhD students, 9 PhDs completed last 4 years, 146 publications last 4 years, 8/13 MSEK/year average internal/external funding.

General assessment of the unit
The Solid State Physics division is a well established unit within the department, with activities mostly at top-quality international standing. The division is focusing on two branches of research – energy and environmental applica-
tions, mostly regarding electrochromic and thermochromic windows for energy saving and increased comfort in the indoor environment; and experimental studies of magnetic materials, including magnetic biomarkers. Spin-glass research has traditionally also been a strong research field. The present “smart windows” research includes a better physical understanding of the properties and optimization of the different active layers involved in electrochromics and new approaches to thermochromics. Further research fields include daylighting systems, and photocatalysis for air cleaning, all contributing to a better indoor environment. The research on magnetic properties is pursued in collaboration with, e.g., the Physics Department. A newer research direction is focused on magnetic particles which are functionalized for advanced biomedical diagnostics. The magnetism is here used for read-out in the assays. Based on excellence in magnetic materials, further work towards magnetization dynamics and functional magnetic materials is being pursued.

Quality of research
The program in energy and environmental applications is of top-quality, as amply witnessed by the recent award of a senior ERC grant to the group leader to pursue further developments in the field. Publications and invited talks clearly reflect this high-level research activity, which also resulted in promising spin-off activities.

The work on magnetic materials is of internationally high standard.

Research environment and infrastructure
Given the age structure regarding the senior researchers (the youngest of the pre-existing professors is 54 years) the recruitment of a new professor, strongly contributing to, e.g., surface vibrational spectroscopy, is a strategic one. The division also plans to ensure continuity in optical measurement technology and teaching related to energy efficient building by new recruitment.

There is a good collaboration with spin-off companies strengthening the research activities.

Networks and collaborations
An effort is being made to create the Ångström Centre for Magnetization Dynamics jointly with the Physics Department (Olle Eriksson, ERC Senior Grant holder). This effort is prioritized by the Vice-chancellor for Wallenberg Foundation funding. The activity in functional magnetic materials involves close collaboration with several other groups in Uppsala. An added value to the advanced research programs in the division is that they since long incorporate researchers from developing countries, frequently in so called “sandwich” programs.

Opportunities for renewal and emerging science
The collaboration in between the magnetism group and the biomarking activity in the Nanotechnology division seems very promising and rewarding.
**Actions for successful development**
The new ERC grant will enable the hiring of additional postdocs, which can bring in further cross fertilization and renewals.

**Effects of the KoF07-evaluation**
The committee notices that the division followed recommendations from the earlier evaluation to discontinue, or to concentrate some scattered research activities into the main research themes.

**Other issues**
In particular the research in indoor environment has a strong outreach aspect creating interest in science among the public.

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**Industrial Engineering and Management**

**Statistical data**
1 professor, 2 PhD students, 2 publications last year, 1/0.4 MSEK/year average internal/external funding (2010).

**Quality of research**
The division “Industrial Engineering and Management” exists since 2 years and is in its build-up phase. Due to that it is too early to assess the quality of research. The staff is heavily loaded with teaching due to a high demand from students. The strategic research areas have been defined as “life sciences” and “energy”. This fits well to successful activities of the Engineering Department and is in accordance to the needs of society.

**Research environment and infrastructure**
In spite of the recent start of the division two externally funded PhD projects have been started in cooperation with other divisions (life sciences and energy). The excellent experimental infrastructure in the Ångström lab appears adequate for that type of research.

**Networks and collaborations**
By nature of their work the group is networked with other divisions in engineering and also other research groups in Uppsala University (e.g., economics) and outside (e.g., KTH).

**Opportunities for renewal and emerging science**
Since this is a new activity it should be given time to develop. No action for renewal is necessary now.
Actions for successful development
See above.

Effects of the KoF07-evaluation
No effects, the activity was started in 2009.

Other issues
This is an untypical research activity in the classical sense and should be judged after special criteria in future evaluations. It nevertheless points in an important direction. It is led by an enthusiastic team and should be given the opportunity to develop. The goals are ambitious: A tripling of staff is envisioned over the next five years.

Electricity

Statistical data
10 professors, 16 researchers, 43 PhD students, 10 PhDs + 18 Lic. completed last 4 years, 163 publications last 4 years, 6.4/39 MSEK/year average internal/external funding.

General assessment of the unit
The Electricity Division presented buoyant research activities encompassing most of its constituent sections as depicted in the document and presentations to the panel. The research profile presented provided evidence of addressing societal needs (especially in energy) arising through multidisciplinary approaches having clear impact on many of the subject areas being worked on. The division employs systems approaches utilizing fundamental understanding based on electromagnetics, hydrodynamics, aerodynamics coupled with traditional mechanics to arrive at real-life solutions of problems encountered by society.

The division has significant interdisciplinary activities and collaborations at the internal and external levels. In addition, work on the large monitored projects not only strives to generate new technical knowledge and know-how, but also undertakes important studies on the environmental, social and techno-economic aspects of the areas under investigation.

Quality of research
The Electricity Division has activities on twelve research topics forming three main research directions: (i) Energy conversion and systems: (ii) Smart electric grid components and systems, and (iii) Discharges, transients and plasmas. These activities also appear as: Wind power, Diamond Electronics, Lightning research, and Wave power.

The division shows a strong research especially in renewable energy, hosting
at least 5 national/Nordic centres and an involvement in one of the three EU European Institutes of Technology/KIC – InnoEnergy. These, in combination with the facilities at the university and the large testing centres represent a clear leadership in these fields.

If one assumes a 16 FTE (full time equivalents), across the years 2010, 2009 and 2008, journal publications and PhD researchers show a healthy profile with around 2 publications and 3 PhD exams per FET. However, grant income has shown a drop by approximately 28% which may be due to cyclic grant applications issues.

There was no presentations given on the activities of the Fusion and Plasma groups within the division and hence these are not considered in this review.

In terms of research quality, the renewable energy section is top-quality whilst others are internationally high standard. The panel agrees that the division can be regarded as top-quality in most of its work especially those related to marine renewable energy.

**Research environment and infrastructure**

Due to a lack of detailed data on personnel and their age profiles, it is difficult to give a clear guidance or advice of some of the issues highlighted under this title. However, from the limited data available, having 4 out of the 10 professors being external may be beneficial from the division’s point of view in terms of outreach but may not provide the necessary platform to build a critical mass for the research areas.

The laboratory facilities and the co-location of academic and researchers provide a vibrant environment and coherent environment for building world class activities in Uppsala.

**Networks and collaborations**

As indicated earlier the division has an international profile as well as running significant national/international centers. The staff also interact well with industry and as journal Editors, part of EU programs assessment (ERC). Since 2001, and through the university innovation program, the division created 8 spin-off companies, three of these since the last assessment of 2007. This is a good reflection of a significant number of patents held by the division’s members.

**Opportunities for renewal and emerging science**

It is recommended that the 12/10 research themes/directions are streamlined in terms of coherence and management. Perhaps a new structure to provide this could be based on the following: (1) Renewable Energy: Systems and Applications; (2) Fusion and Plasma Systems, and (3) Lightning, Discharges and Electromagnetic Interference. Such groupings will be more reflective to those given by the division in their evaluation material and will be a better representation than the current diffuse nature of activities.

Leadership of these strands should be identified and supported (injection of
new staff), providing a logical agglomeration of the research themes and providing realistic pathway to engage with academic progression of junior staff and PhD students within each pathway.

**Actions for successful development**
This is covered above.

**Effects of the KoF07-evaluation**
There were not enough details in the submission to give a clear feedback on this issue. However, it is clear from the limited comments that the division was disappointed with the support received from central resources.

**Other issues**
The research environment is excellent as created by a very dynamic leadership. The co-location staff, students and facilities provide the necessary platform to allow interactions between the various sections of the divisional community. This should be safeguarded to maintain and enhance cohesion at the various levels of research and trainings both doctoral and postdoctoral levels.

The division interaction with society through the press and with schools is to be commended.

**Applied Material Science**

**Statistical data**
2 professors, 7 researchers, 21 PhD students, 4 PhDs + 1 Lic. completed last 4 years, 105 publications last 4 years, ca. 4/11 MSEK/year average internal/external funding.

**General assessment of the unit**
The panel was very positively impressed by the group. It demonstrated a very high level of activity, produces high quality work, provides a vibrant environment for students and faculty, and it displayed impressive leadership. It is a prime example of a modern engineering research group.

After a long and successful period of high level research in tribology this division has been restructured (retirement of Hogmark) and was merged with the electron microscopy division. For easier comparison with the KoF07 assessment we will report on the electron microscopy group separately.

Main research areas and goals:
- Materials in Medicine: Develop novel implants and drug delivery solutions for the “grey” community.
- Tribology: Together with industry meet the increasing demand on safer and more environmental friendly processes and products using tribology.
• Nano Engineering and Electron Microscopy: Analysis of materials that derive their properties from sub-micron to sub-atomic scale and build nanostructures/materials (evaluated separately due to merger during the evaluation period).

**Quality of research**

Materials medicine and tribology activities are considered to be internationally high standard.

Building on a strong tradition for tribology the group has embarked into a new area called “materials in medicine”. This endeavor has been successful: Impressive results with new materials for spinal cord repair, skull implants, and drug delivery have been achieved in fruitful collaboration with external and internal partners. The activities are disseminated in invited talks at important international conferences, clinical trials with patients are already taking place, and two companies have been spun out of the activities the last two years.

Tribology research is continuing a tradition on a high international level covering aspects from the macro- to the nano-scale. Topics include environmentally friendly combustion engines (e.g., on ships)

**Research environment and infrastructure**

The panel did not visit the labs, but the equipment for materials science seems to be in order. The building infrastructure at Ångström lab is generally very good. The research environment was excellent; dynamic and positive.

**Networks and collaborations**

The group has extensive collaborations with companies (more than 10 mentioned). All projects seem to be benefitting from extensive national and international (?) collaborations.

**Opportunities for renewal and emerging science**

The group has plans to start a new center “Science for Life” with partners within the Ångström laboratory. This initiative seems timely and well thought through. Better tools for tribology research are also an interesting future focus area in the group with the ultimate goal to make more environmentally friendly engines. In general Uppsala University, starting with the other groups in the Ångström lab, shares a fantastic infrastructure and scientific environment that could nurse many more interesting collaborations. The group could perhaps benefit from a few “blue sky” projects that go in entirely new directions.

**Actions for further development**

The panel encourages the division to keep up the good work. A little more brave and courageous actions with a few new projects would be beneficial. The division has potential, infrastructure and research environment to perform even better.
Effects of the KoF07-evaluation
After the retirement of the world leading tribologist, Sture Hogmark, the group has, with success, followed the KoF07 suggestion to continue this line of research. It has additionally managed to build a new activity in “Materials in Medicine” with great success.

Other issues
The division addresses major challenges for the world population: Energy, aging, etc. and has undergone a successful change of generation.

Research activities in this division are quite diverse. At first sight there appears little interaction between the tribology oriented work and the biomaterials activities. It should be monitored over the coming years whether potential synergies can be exploited between the three groups: biomaterials, tribology and electron microscopy.

Applied Mechanics

Statistical data
1 professor, 1 researcher, 2 PhD students, 2 PhDs + 1 Lic. completed last 4 years, 15 publications last 4 years, ca. 2.4/0.3 MSEK/year average internal/external funding.

General assessment of the unit
After a long and successful period of high level but also somewhat isolated research in “impact and waves” this division has been newly formed. A new professor has been hired from KTH from Jan. 2011 on. It is too early to make any comments about the quality and impact of the research.

The envisioned research program seems to fit well to the other activities in the Engineering Department. The aim is to concentrate on mechanical properties of nanocomposites and on solid mechanics.

The division seems to be well networked with other groups in Europe in their field. Currently the division is setting up laboratories, a teaching program and has submitted six research proposals.

The research program of this division is new and under definition. It looks promising, fits into the strategy of the Engineering Department and it should be given some time to develop. The hiring of an assistant professor is planned for fall 2011. In view of the panel this should be a person with a research profile in the area fluid mechanics so the integration of this division in the Engineering Department becomes even stronger.

Whether the substantial “reformation” of this division since the KoF07 is a result of the recommendations in 2007 or whether it would have happened anyway due to the retirement of B. Lundberg is difficult to judge for us.
Electron Microscopy (now with Applied Materials Science division)

Statistical data
1 professor, 2 researchers, 2 PhD students, 2 PhDs completed last 4 years, 32 publications last 4 years, 3.5/2 MSEK/year average internal/external funding (2 years).

General assessment of the unit
The research is concentrating on the following main activities: (i) magnetic circular dichroism to increase the TEM resolution (EMCD), (ii) studies of the soft/hard matter interface for bio- and nano-materials, (iii) nano-engineering, and (iv) functionalisation of electrodes. Whereas this was a separate division in the past, the activities are now part of the Applied Material Science division.

Quality of research
The quality of the work is of internationally high standard. The interactions with other divisions allow publishing on the characterization of advanced materials and structures such as, e.g., graphene, nano-structures and bio-materials.

Research environment and infrastructure
The unit is strongly relying on collaborations with other researchers and on the access to electron microscopes. The latter is a weak point as the head has no responsibility over the facilities and no control on the planning of future equipment. Besides performing research, the group also should be directly involved in a certain amount of service activities.

Very good activities are on going to developed new techniques based on electron microscopy. A typical example is EMCD, based on measuring with high resolution magnetic moments of the material. This offers new possibilities.

Another very important research area with a strong potential in the field of bio-materials is the study of the interface of hard/soft matter. This is an excellent field for collaborations and to attract PhD students. A new and unique technique to study the interface has been developed. Also the nanoelectrode-nanoparticle bridge platform has a strong potential.

The intended future strategy concerning TEM analysis of interfaces and the characterization of novel nano-materials, structures and devices is surely a good choice. The only question is how much work can be performed taking into account the small size of the group and required access to state-of-the-art electron microscopes. A possible solution can be found in a strong collaboration with other microscopy facilities. The possibilities for future investments in a new microscope should be investigated at faculty level.

Keeping in mind that the division had no responsibility for the electron microscopes facility and the small size of the group it can be considered as positive to belong to a larger division.
Signals and Systems

Statistical data
3 professors, 6 researchers, 5 PhD students, 4 PhDs + 3 Lic. completed last 4 years, 44 publications last 4 years, 5/11 MSEK/year average internal/external funding.

General assessment of the unit
In terms of disciplinary scientific basis, this division is something of an "outlier" in the department, relying more on statistic signal processing, system and control theory, acoustics, and software algorithm development than on physics, material science, and hardware development as is the case in most of the other divisions. However, there is significant interaction with several other divisions, e.g., Solid State Electronics, Micro Systems Technology, Microwave Engineering, and Electricity (as well as Computer Engineering in the IT department), and there seems to be significant resulting synergy effects within, e.g., sensor technologies/networks (WISENET), wireless interfaces, and SmartGrid technologies (InnoEnergy). This is an organizational benefit of keeping this division in the Engineering Department. The division is much diversified (too diversified, compared to its size?) in terms of application areas. The relevance and societal impact of the research is in general very high.

Quality of research
As an overall judgment, the scientific quality of the division lies between internationally high standard and internationally recognized, with some differentiation between topics. The senior professors have very good publication and citation records according to the general standards and traditions of the division’s scientific fields. The track record of external funding is also very good (40–50% of total turnover) and coming from a diverse set of national and international sources. The division places a lot of emphasis on making an impact on important “real” problem solutions, and use in practical applications, while at the same time recognizing the importance of theoretical depth and academic achievements.

Of the five major research directions highlighted by the group, the activity on signal processing and wireless communications (4G wireless systems research) is particularly strong, and of internationally high standard – as measured both through academic and societal impact.

The wireless sensor network activity has a shorter history so is harder to assess, but quality so far appears to very good, probably with the potential to reach internationally high standard within the lifetime of the WISENET centre.

As far as the panel can see, the activity on non-destructive evaluation of materials has had a somewhat smaller academic impact internationally so far. The panel deems it to be of at most internationally recognized standard at present.

The activity on wireless control is too young (18 months old) to be given a
serious assessment, but given the strong backgrounds of the leading researchers in control theory and wireless communications, there is no serious reason to doubt that this could evolve into a very successful activity if allocated the proper resources. The topic also has strong industrial interest (ABB) and huge commercial potential, as well as presenting many interesting scientific challenges in the interface between wireless communications and control theory.

The audio signal processing activity has had a strong impact in terms of a successful spin-off company with software products currently in use by several high-profiled and discerning customers with very stringent quality demands, such as BMW, Bentley, Rolls Royce, and DTS Digital Cinema. This is very impressive and indicates that the underlying scientific work is on a high international level even though the academic output and impact in terms of citations is so far modest (this might have to do with IPR issues resulting in publication delays?).

Research environment and infrastructure
The division is currently quite small, with 3 professors and 5 lecturers, 5 researchers and 4 PhD students. The achievements are impressive when normalized by this modest size. To (even partly) realize its very ambitious goals, however, the division clearly needs to expand. Local collaboration is extensive, towards many other divisions in the department as well as towards the IT department. The division relies on computer algorithm development and software solutions to a larger extent than most other divisions, but also performs physical experiments. The combined electromagnetic/ acoustic anechoic chamber is a nationally unique facility which is also cutting-edge in a European perspective. A new wireless sensor network lab facility has also been set up, through the WISENET centre. Overall infrastructure seems very good and well aligned with the needs of the division, although future infrastructure investments for the long term might present a challenge given the apparent recent changes in Swedish research policies.

Networks and collaborations
The division is as internationally well-connected as one should expect from a group of this stature. It has a history of participating in well-profiled EU projects and is currently participating in the “flagship” 7FP project Artist4G, dealing with 4G mobile communication systems development. The consortium involves many major equipment suppliers as well as major telecom operators. Recently the 4G system research has been extended to include collaborative projects involving three top Chinese universities. The group also has participated very constructively with other good Swedish university groups in wireless communications (Chalmers, Karlstad) in successful national projects for several years. Finally, it should be mentioned that the internal collaboration within the division seems to be working particularly well, with two of the senior professors having a long and successful history of joint projects and publications.
Opportunities for renewal and emerging science
All the directions for future research suggested by the division are by themselves appropriate and interesting, and well aligned with the division’s scientific strengths, needs of society, and/or commercial potential. However, the panel believe that it would be beneficial for the division in terms of quality development, and international visibility and impact, if it could consolidate its resources in somewhat fewer directions overall. The WISENET environment presents stable long-term external funding and collaboration possibilities which is and should be used to strengthen the group in the direction of wireless sensor networks. The fields of wireless systems research and audio signal processing are, in different ways, the main strengths of the group today and should be pursued further. Wireless control has strong industrial interest and relevance, as well as being a hot new scientific topic where the senior professors are also ideally placed to make strong contributions. Thus, among the suggested topics, the field of non-destructive evaluation of materials may be the one to discontinue should the division choose to gather its forces around a smaller set of topics in the future.

Actions for successful development
The division overall manages, despite its relatively modest size, to already today do remarkably well in several of the many topics it pursues. However, given the extremely ambitious goals stated by the division (they basically state that they strive to either maintain or achieve a world-leading position in all five future topics) there is definitely a need to expand the personnel in the division, as well as to exploit the achievable internal synergies at the department (and the national and international collaboration networks) for all they are worth. Furthermore, even given a realistic increase in personnel it seems overambitious to go for an internationally leading position (in the academic sense) in all five fields. If international top level status in the true academic sense of the word is the goal, it is advisable to concentrate the extra faculty resources that may be allotted to the division in the future in fewer directions. Perhaps two of the directions may be singled out as particularly well-suited for reaching international top academic recognition and visibility (the potential and know-how is definitely there)? The prioritization when allocating new incoming faculty resources should then reflect this choice. The goal for the other activities could be to keep them at their current (mostly very good) level, and aim for external funding to achieve this goal.

Effects of the KoF07-evaluation
The division says in its self-evaluation that the KoF07 process and recommendations have not affected the division in any significant way. This division was not evaluated by the Engineering Department panel in 2007, but by the IT panel, together with the IT department’s division Systems and Control. The recommendation from that panel was that it might be a good idea to merge these two divisions, due to their scientific overlap and to ensure critical mass.
However, the current Engineering Sciences panel understands that, although superficially similar scientifically, there are today significant differences in the activities in the two divisions. The Signals and Systems division, although surely working on theoretically deep problems, is fundamentally driven by a desire to contribute to real and important engineering problems, and to make a real impact in practical applications. To achieve this goal the current organization in the Engineering Department seems appropriate; neither do we detect a wish for a merger from the scientific personnel. The already quite significant achievements by the division in its current incarnation, coupled with the impression of differing goals and motivations for the work in the two divisions, indicate that there might be no significant gain to be made from a merger.

Other issues
The division has overall excellent interaction with society both through longstanding collaborations with major national and global industries like ABB, Ericsson, Alcatel Lucent and Nokia Siemens, various SMEs through the WISENET Centre of Excellence, and national environmental agencies such as SKB and SKI. The division has spawned several patents since 1996, and 2 spin-off companies (the panel notes in particular Dirac Research, which has an impressive list of high-profiled customer companies, e.g., in the car industry), and their research results from long-term European and national research projects have made an impact on major upcoming wireless system standards such as the LTE 4G mobile communications standard. The panel is impressed both with the high level of relevance and the overall quality of the research.

The number of PhDs graduating seems to be at a relatively low level at the moment, but the historical track record of the division is good in this respect. The chair particularly emphasized the great importance attached to doctoral thesis production in the division. There appears to be no postdocs in the group at present, so recruitment of good postdoctoral candidates, preferably from outside Uppsala University, should be encouraged, for larger research intensity and supervision capacity.

Nanotechnology and Functional Materials

Statistical data
1 professor, 9 researchers, 12 PhD students, 4 PhDs completed last 4 years, 66 publications last 4 years, 3.3/7 MSEK/year average internal/external funding.

General assessment of the unit
The motto of this division is: Nano for Life. The main research areas are:
- Sensitive diagnostics
- Drug delivery
Orthopedic implants

Environmentally friendly batteries

This division is on a very positive trajectory. The recent breakthrough in “algae batteries” has had significant international impact. The group is a prime example of the type of “disruptive innovation” that an interdisciplinary group working at the borderline between science and applications can foster. Leadership by the division head is excellent; visionary and dynamic. Plans to enter into a strong collaboration with adjacent groups in the Ångström lab are timely and provide great potential for further development toward world leadership in selected fields because it will give higher critical mass and a platform for increased international visibility.

Quality of research

The activities are considered to be internationally high standard if not top-quality (world leading). Environmentally friendly batteries are the most highly profiled activity.

Research also includes development of cost effective sensing systems for diagnostics based on magnetic nanoparticles (collaboration with the solid state physics group), drug delivery systems based on cement, and silica nanoparticles. Impressive results on surface modifications of silica nanoparticles allowing trans-membrane drug delivery. Success is reflected in invitations for international events, papers, patents and spin-out companies. Implants incorporating intelligent drug delivery systems for long term release based on heterostructures are a rather promising activity. Environmentally friendly batteries based on algae display an unusual ability of the group to be creative with simple means (salt, paper, algae, polymers, etc). It is an excellent result with high potential for further development already reflected in collaborations with industrial partners, and patents.

Research environment an infrastructure

The panel did not visit the labs, but the equipment for materials science seems to be in order. The building infrastructure at Ångström lab is generally very good. The research environment was excellent; dynamic and positive.

Networks and collaborations

The group has extensive collaborations with companies and very good international visibility. All projects seem to be benefitting from extensive national and international collaborations, which is an integrated part of the group strategy.

Opportunities for renewal and emerging science

The group has plans to start a new center “Science for Life” with partners within the Ångström building. This initiative is timely and well thought through. The group could perhaps benefit from a few “blue sky” projects that go in entirely new directions.
Actions for further development
The panel encourages the division to keep up the good work. It has potential, infrastructure and research environment to perform even better.

Effects of the KoF07-evaluation
Recommendations to focus on algae battery and industry collaborations have been followed. The slight change in quality assessment of the division most likely reflects the change in the evaluation panel rather than a change in the actual standing of the work.

Other issues
The group would benefit from an upgrade of the electron microscopy facility. This should be given high priority. Formation of a “Science for Life” centre in the Ångström lab should have very high priority and full support from the university.

Micro Systems Technology

Statistical data
2 professors, 9 researchers, 9 PhD students, 9 PhDs + 2 Lic. completed last 4 years, 58 publications last 4 years, 6/14 MSEK/year average internal/external funding.

General assessment of the unit
The division is concentrating on six main research areas: (i) materials and microprosessing, (ii) microactuators and microrobotics, (iii) microtechnologies for sensorics and wireless communications, (iv) microtechnology for space applications, (v) microfluidics, and (vi) BioMEMS. The head of the division is retiring soon, but the research leadership has been shifted successfully to hands of young dedicated professors. Apart from the number of publications listed above the division generates on the average 2 patents/year and one spin-off company/year. The research is multi-disciplinary, very experimental and applied for a variety of novel applications, and creating high-quality results as PhD exams, journal papers, patents and spin-off companies.

Quality of research
Internationally high standard
- Microfluidic systems and Bio-MEMS; including advanced actuation, particle handling and separation technologies.
- Materials and methods for polymer based microfluidic on-chip analyses.
- Microtechnology for space applications; nanosatellites and microsensorssystems.
Promising new openings: stretchable electronics, microsystems for early diagnostics in neuro-degeneration, piezoelectric polymers for haptic applications.

The panel supports strongly the goals identified in the self-evaluation document for improving quality results towards top – world leading.

**Research environment and infrastructure**
The composition of the research team with 5 professors, 8 postdocs and 10 PhD students is well balanced. Multidisciplinary orientation of the senior members has ensured the introduction of important and relevant new research topics. MST as an enabling technology has been developed in application oriented collaboration in several multidisciplinary centers successfully fertilizing internal collaboration inside own and between other departments.

This experimentally oriented division is heavily dependent on the capability of the cleanroom facility and equipment and therefore future care of cleanroom competitive capabilities is extremely important. The division is also a partner of a national Myfab infrastructure. They are nationally networked in national programs like WISENET.

The research is based on strong material-process-device co-development and is very application oriented aiming to industrially exploitable solutions. The best examples of the innovativeness of the research are five new spin-off companies founded since KoF07.

**Networks and collaborations**
Researchers are actively operating in European networks and highly qualified bilateral collaborations overseas in USA and Asia.

**Opportunities for renewal and emerging science**
Promising new directions are in stretchable electronics, microsystems for early diagnostics in neuro-degeneration and piezoelectric polymers for haptic application.

**Actions for successful development**
Recommendation to challenge higher impact publication forums. Further identify potential disruptive joint efforts with emerging electronics team for disposable diagnostics and sensing applications.

**Effects of the KoF07-evaluation**
As a result of KoF07 evaluation the joint Diamond Centre was established and one PhD student funding was granted for diamond waveguide infrared spectroscopy research for biosensor applications.
General conclusions, observations and recommendations

General impact of the KoF07 evaluation on the department as a whole. – According to the perception of the Engineering Department itself the KoF07 had a “disappointingly small impact” in spite of the generally high ranking of its quality in the KoF07 report. This is likely to be a narrowed view on the additional funding received from Uppsala University based on KoF07 which apparently was indeed small. In terms of topical renewal and organizational chances the panel has the impression that KoF07 had quite a noticeable impact, e.g., concerning the increased cooperation between the divisions, the establishment of “centers” or the discontinuation of subcritical research activities.

Visibility as engineering school. – The panel found a general concern throughout the department about the perception of Uppsala University in relation to engineering strengths as represented by the engineering school. There are several ways discussed within the department how to reach a better visibility of the Engineering Department. These could be more PR activities or the promotion to an independent faculty, or other.

Faculty status. – In the KoF07 report the question was put forward whether the Engineering Department should become an own Faculty. And it still seems to be a relevant issue. We refer here to the remarks made in the beginning of the document.

Publishing in high-impact journals. – In view of the excellent experimental facilities in the Ångström lab and the appealing research program we encourage the researchers in the Engineering Department to take more opportunities to publish in high impact scientific journals. This would increase visibility and improve ranking.

Microstructure Laboratory. – The MSL in the Ångström lab is a unique and excellent processing and analytic clean room laboratory. Several of the divisions in the department use it intensively. In order to stay up to date and competitive, a continuous renewal of capital equipment is necessary. In particular the analytical equipment (e.g., electron microscopes) is mostly over 10 years old. Since external funding for equipment renewal appears more difficult to obtain in future in Sweden, Uppsala University should safeguard sufficient funds to ensure the laboratory to remain competitive. Conversion of parts of the MSL from semiconductor processing to life-sciences oriented research has been started and this is supported by the panel.

PhD students. – The panel interviewed a selection of PhD students. Generally they feel very happy with the conditions and guidance at the Engineering Department. An open climate and easy access to their supervisors is appreciated by the students. Still in some cases there seems to be an issue about too little
advice on which courses to take during the PhD. Exchange (weeks – months) with laboratories abroad would be welcomed by the students.

**Gender issues.** – Among the professors and senior researchers there is a strong male majority, which may have historic reasons and can be found at almost any engineering research unit worldwide. For the PhD students though the ratio is better balanced which means the problem may disappear with time.

**New professors.** – If there is a chance to hire a new professor the department should consider to hire someone not safeguarding continuity in a given field but rather a person acting similarly like a “libero” in a football team, bringing in new, disruptive and non-conventional ideas.

**Other.** – One issue which needs to be raised is related to the reports sent to the panel before the site visits. In case future KoFs are planned, the self evaluation reports should be streamlined and structured in a standardized format so that the appropriate performance indicators appear (CVs, publications, citations, etc.) that will allow the panel more easily to provide the necessary judgments based on the provided criteria by Uppsala University. The relevant information was difficult to find in the Uppsala University database.
Scope of the panel’s evaluation:
Department of Information Technology

Department of Information Technology

Overview
Computer Science (CS) remains one of the highest-priority research areas for society and the economy. It is a rapidly changing field providing opportunities for making significant impacts. Within Sweden, Uppsala is one of the strongest CS departments and has demonstrated this fact by sustained high quality publications and research funding.

General comments
It is important to note that, while members of the panel have their individual competency areas, this report of panel 18 is based on the collective judgement of all the members of the panel – as encouraged in the terms of reference for the evaluation. All members of the panel took part in both discussing and writing the evaluation for each of the divisions and centres. Thus, the report should be read as reflecting the views of the panel as a whole, and not simply as the sum of a series of individual reports reflecting the views of specific panel members with specific research interests.

Most of the projects and some of the centers were given ratings according to the scale proposed to the charge to the panel: 1 = “Top-quality”, 2 = “Internationally high standard”, 3 = “Internationally recognized standard”, 4 = “Acceptable standard”, 5 = “Insufficient”. Pluses and minuses should be interpreted as on grades.

Computer Systems

Embedded Systems
Rating 1.5 (between Top-quality and Internationally high standard). This chair was created as a result of the KoF07 recommendation and filled with Wang Yi, a very good choice as the recent results of him and his group prove. Wang Yi has worked on two highly relevant subareas of embedded systems: scheduling and timing/performance analysis for multi-core platforms. Multi-core platforms will be increasingly used in the embedded-systems domain. Not many results from mono-processor scheduling have corresponding results in multi-processor scheduling. A major result, obtained by Wang Yi and his collaborators, was
the transferal of the Liu/Layland result about the sufficient condition for rate-monotonic schedulability to the multi-core setting. This is a breakthrough in an important area. Methods for timing (WCET) analysis for systems running on multi-core platforms will be needed in the near future, but do not exist for architectures with shared resources. Wang Yi and his collaborators have considered shared caches and developed a cache-partitioning scheme to increase predictability. This group is on the right track, selecting well motivated problems, and producing very strong results. It plays in the major league worldwide.

**Algorithmic Program Verification**

Rating 1.5 (between Top-quality and Internationally high standard). The algorithmic program verification group is a top-quality research group with high international visibility. It has major contributions to infinite-state model checking, verification of timed and probabilistic systems, automata theory, automata-based verification, and model generation. The group publishes in leading conferences and won several best paper awards.

Its international visibility is shown in its high involvement in program committees, steering committees and chairing of leading conferences. It is also shown in the number of international postdocs and visitors.

The group is active in several interdisciplinary projects in Uppsala University, such as UPMARC and CoDeR-MP.

**Architecture**

Rating 2 (Internationally high standard). Since 2007 there has been a significant investment in this group, attracting international talent. Overall the work is of internationally high standard. One of the major achievements of this group has been the work on low-overhead sampling techniques that can be fed into a parametric cost model and used to identify performance issues in parallel programs. This performance diagnostic tool has been successfully commercialised in a spinoff company which was recently acquired. This is internationally one of the most successful commercialisation activities in recent years. This technology is now being extended to enable design space exploration of architecture and runtime co-scheduling policy. The performance-oriented work has been complemented and enhanced by work on power-efficient architecture. This work has moved beyond the pioneering work in cache decay to considering the difficult challenge of energy efficient cache coherence. It’s good to see that the group is attracting substantial external funding and is well connected to significant international groups and networks. As multi-cores underpin much of the work at Uppsala, it would be worth considering if other researchers could become more strongly affiliated with this group.

**Computer-Communications**

Rating 2– (Internationally high standard). The computer communication group is currently concentrating on research related to wireless networks with focus...
on “challenged” networks as well as on wireless sensor networks. Moreover, network security is of increasing interest. Although wireless sensor networks have been a subject of research for several years, there is still some lack of systematic and repeatable practical experiments. The group addresses this aspect with some focus on the influence of the wireless medium and energy consumption. Furthermore they investigate the impact of emerging new Internet architectures, such as content-centric networks on wireless networks.

The work of the computer communication group is to a large extent experimentally oriented. It comprises system prototyping and systematic experimentation and is complemented by simulation experiments. The resulting prototypes are demonstrated at international leading conferences such as ACM Mobisys and ACM MobiHoc. The ACM Mobisys demonstrator was awarded with the best demo award. The group is involved in highly visible EU projects, namely HAGGLE and ResumeNet. They are collaborating with leading research groups in the U.S. (e.g., Deborah Estrin, UCLA) with respect to participatory sensing. Per Gunningberg is currently on sabbatical at the very prestigious ETH.

The group participates in large national programs, and the Wisenet center is led by the head of the group. The start-up company OptiMobile was founded by members of the group. Moreover, they hosted internationally leading conferences, namely the ACM SIGCOMM and the ACM MobiSys.

Computing Science

The division has recently lost its long-term leader, Arne Andersson, who has left to pursue a startup company in the area of on-line auctions (although we appreciate that he remains active in the group to the extent possible). Nevertheless, it continues to thrive under new leadership, and we are optimistic about its future.

Applied Process Algebra

Rating 2– (Internationally high standard). While there are a number of concurrent specification languages that have been developed and studied in the past several decades, none has been accepted as canonical. Such specification languages range from, say, Petri nets and multiset rewriting to CSP, CCS, and the pi-calculus: many variations in each of these frameworks have also been considered in the literature. A great deal of work has gone into defining and proving properties surrounding each of these individual frameworks. Given that these languages are used as the basis of specifications, their formal properties are critical to establish. Experience in the past decade with these frameworks has also shown that establishing their formal properties is a truly complex task and is prone to error. Proofs involve inductive and co-inductive inferences involving complex invariants. Similarly, the level of abstraction of process speci-
fication languages is rich and difficult for current theorem-proving technology to match well. In particular, reasoning about a given program is a much more concrete and well established activity than reasoning about an entire specification framework.

The research focus of the Applied Process Algebra group is in the development and formal verification of a framework for process calculi that promises to provide some much needed unity to the world of concurrent specification and verification. In particular, this group has been active at developing the psi-calculus, a framework for specification that can be instantiated to a number of different frameworks, such as the applied pi-calculus and the fusion calculus. One of the design goals of the psi-calculus is that many of the critical properties of this calculus are inherited by the calculi that result from instantiating the psi-calculus. Thus, once one proves properties of the psi-calculus, these properties are inherited by the instantiated specification languages. These researchers are using the Isabelle/Nominal theorem prover to formally prove properties of the psi-calculus. Such a verification process is a major undertaking but when it is finished, the resulting specification language has robust guarantees.

This work is internationally known and fits well with a number of internationally recognized research efforts, such as, for example, the POPLmark challenge. The process-calculus work and the theorem proving effort are all involved with state-of-the-art formalisms and technologies. This work will provide a number of formally verified calculi and a number of important theorem proving tools for verification. The researchers are also considering ways to build a number of other tools – such as model checkers and static analyzers – based on their formalized concurrent specifications.

Constraint Programming
Rating 3+ (Internationally recognized standard). The technique of Constraint Programming (CP) is used for formulating and solving combinatorial problems. It started as Constraint Logic Programming (CLP) in the late 1980’s and was then generalized to be used in a variety of other programming languages. In the case of CLP it can be implemented as an extension of the interpreter of the language, whereas in the case of compiled languages it requires the introduction of a specialized constraint language that extends the host language.

CP methods have many uses in various parts of Computer Science and in applications, and the technology is well understood and researched. Current research addresses further improvements to the algorithms for search and propagation that underlies the method, and the definition and implementation of additional constructs in the language for expressing the constraints.

The ASTRA group has worked on CP since 1998, with the use of CLP being the major but not the exclusive choice of host language. It is a relatively small group, with one professor, one docent and 3.5 PhD students. The group is well connected internationally, nationally, and in its home university. Applied projects are an important part of its activities, specifically in the areas of Air Traffic
Management (external application) and in Wireless Sensor Networks (within its own department). It is also a valuable source of competence for some groups in other departments of the university. Besides these applied projects, it also does basic research in the contemporary areas of Constraint Programming research.

The ASTRA group is well recognized and respected on the international level and its research is of good international quality. The panel recommends continuation of the work with a stable funding level, provided that the overall funding for the department remains at least on its present level.

If any recommendation were to be given to the group, it would be to encourage the group to be somewhat more adventurous in its choice of research topics so as to take a chance of moving ‘ahead of the crowd’. An attempt to make a strong integration of CLP in a special-purpose programming language could be such an idea. Investigating implementation issues for CP in a multicore architecture is also a possibility that comes to mind.

**Programming Language Technology**
Rating 2 (Internationally high standard). This small group has large-scale impact with its work on Erlang compilation and runtime management. It has an increasing user base with impressive industrial uptake. Since the last review, the group dramatically reduced in size partly due, it seems, to a lack of sustainable research funding. In future, the department should consider how to coherently manage its resources so that small but highly promising areas, such as programming language technology, have the same opportunity for long-term growth and sustainability as do other larger groups. More recently the group has stabilised and is growing again. It was heartening to see that significant EU funding has recently been obtained and that the group has broadened its vision with the ProFun project and UPMARC. The recent work on object-oriented type analysis and concurrency is strong. Overall the work is of international high standard and longer term closer integration with the Architecture group should be considered.

**Database Systems**
Rating 3 (Internationally recognized standard). “Database systems” represents a larger portion of the CS spectrum than many of the other topics that were presented to us. Most universities have some activity in this area, so it is harder to reach the top tier. The emphasis of the group at Uppsala has been on stream management, a topic that has been accepted as one of the important areas of the field. The group aspires to do mining and indexing over streams for example. They recently received funding for this work as part of an FP7 project called Smart Vortex, intended to manage streams emanating from products (e.g., status reports).

A second recent opening of a research opportunity is the group’s involvement in eSSENCE, the e-science project at Uppsala (joint with other universities). We see this work as a major opportunity. We see this work as a major opportunity for the database group, because so many scientific problems these
days require database expertise. We believe that there are risks that the database activity will be squeezed out of eSSENCE as funding gets tight, since the leaders of that center are from the hard sciences and numerical analysis (Scientific Computing) areas, which traditionally have not seen database systems as an essential discipline. We shall have more to say about this matter in the section on eSSENCE.

**Human–Computer Interaction**

Rating 4 (Acceptable standard). The Division of Human–Computer Interaction has been involved for many years in long term studies of work places, helping in the design of usable and useful computer-based systems. The Group has been active internationally in several fora. Focus has been on following a user-centered design tradition in areas such as rail-traffic management, healthcare, and administration. This practical work shows a long term engagement with certain organizations that is distinctive. Likewise, the redesign of the work of rail-traffic management is a substantive contribution, attracting international interest. The committee had some difficulty in determining the exact contribution of this work to computing research. That is, while there are many reports in Swedish on this work, and some international conference papers, the number of papers published in major journals from these extensive research programs is rather low. The presentation of the work of the division was at a very general level, which made it difficult for the panel to assess the concepts and methods being applied. While it is clear that the division has had a strong historical commitment to participatory design methods, and has been a significant player at a national level in this area, how these issues are evolving in the context of newer technologies, work practices, and general socioeconomic transformations in more recent years would be worth examining. The panel regards much of this work as being of an acceptable level, but would again (as written in the KoF07 report) request that the group make much greater efforts to publish their work more extensively, and to reflect on the large body of material they have gathered over the years, in terms of lessons learned, and examine areas for further investigation. It is the opinion of many members of the evaluation panel that in places the work seems more closely aligned to a form of consulting activity than that of a research activity, and this perception, if incorrect, needs to be addressed.

A second body of work from members of the group examines ethical decision-making. While the committee is of the opinion that certainly, the issues of values and ethics are topics of importance in computing as in all other fields, it was not clear to what extent the research output was unique to computing. The committee notes the attempt to develop a more specific ethics for usability, and possibly even support tools for examining ethics issues. This work is of an acceptable level and has been published in a variety of fora.
There has also been a growing interest in computing education research, with several publications. The division has been active in a number of international networks and has helped organize several major HCI conferences and workshops in recent years.

The panel has some concerns over the future direction of the HCI Division in the IT Department. It has been noted that the Group has lost three senior researchers recently, but two new have been recruited. One member has joined from the social science HCI group. Collaboration with other IT Divisions appears weak, which is a pity given the possibilities for synergy – for instance with members of the WISENET Centre on topics such as privacy, mobility, scenario development, prototype testing, evaluation, or possibly the embedded systems group, etc. While the basic issues of usability that have served as the basis for the work of the HCI Division have not gone away, the panel is of the opinion that there is a need to reflect on, and potentially renew, the core research themes in the HCI Group. One potentially promising area for development that has been mentioned is in the area of Visualization, based on the fact that the Centre for Image Analysis is coming into the IT Department. While many of the researchers in this field have been working on more technical graphics issues, several apparently have an interest in interactive image analysis and haptic interfaces. There could be exciting possibilities in the area of visualization, haptics, and interaction providing that research staff with these competencies are available or will be recruited. (The panel did not review the other HCI Group in Social Science and thus has no information as to potential synergies.)

Research into Computer-Science Education

Not Rated. The work of the Uppsala Computing Education Research Group is intriguing. We acknowledge the importance of exploring teaching and learning methods in general, as well as in the computing field specifically. The Group is mainly composed of several young faculty members who have been active in carrying out studies and publishing them. We learned from discussions that this group redesigned the introductory programming course and demonstrated its improved effectiveness when the course was implemented at Uppsala. The panel has decided not to rate the work of the group, as we do not feel we have sufficient pedagogical expertise to judge the work. Certainly, the panel supports the idea of having an activity connected with teaching and learning practices, but whether this should be seen as more of a service activity in the department, or whether it should be set up as a “research” activity in its own right, is a decision that needs to be made within the department or Faculty of the university.
Centers

WISENET
Rating 1 (Top-quality). WISENET is an internationally outstanding center for multidisciplinary research on wireless sensor networks. The tight integration of industry and academia is highly convincing. They seamlessly work as a team that heads for innovative common goals. The focus of the center is on prototypes as well as on experimentation and simulation. The prototypes are driven by a variety of Industry relevant applications (e.g., railway wagon sensor, freezer monitoring). The work covers a broad spectrum. It ranges from operating systems and networks to radio-signals, micro-systems and energy harvesting. This is considered as an internationally unique feature. Many innovative concepts have been developed, e.g., the flexible sensor nodes, the smart wake-up radio and the low energy electronic shelf labels.

The partners publish their work regularly and cover leading international conferences, such as ACM SenSys, IPSN and EWSN. They have received awards such as best paper award and best demo award. Moreover, start-ups have originated from Wisenet and several patents have been produced.

eSSENCE
It is too early to give this new program a rating. However, we are optimistic that, if managed well, it will be a very successful endeavour.

The use of computerized systems is transforming almost every scientific discipline. However, the other discipline applying IT – let’s call it the application discipline – needs to get support for selecting the best algorithms and tools. This is where Computer Science (included, but not limited to “Scientific Computing”) is needed. On the other hand, Computer Scientists profit from learning about relevant problems from the application disciplines. There could be a push strategy on the side of the computer scientists – they attempt to “sell” their methods to the application discipline – or a pull strategy on the side of the application discipline – they ask the computer scientists for help in selecting methods and tools. However, experience shows that the push-strategy would not work.

eSSENCE offers a stimulus for the communication between Computer Science and the applications disciplines. Cooperation is supported by very well-invested money. The evaluation panel had the impression that the stimuli work very well, that both sides profit from the cooperation. The involved researchers attempt to publish the different aspects of joint work in venues of both areas. It was not clear, though, what the envisioned infrastructure should be and how evaluation of the cooperation will work.

There is a serious risk in a well-meaning attempt such as eSSENCE to combine the efforts of serious domain scientists with the work of serious computer scientists. While domain scientists have a long period of comfort with collaboration with numerical analysis (scientific computing), the idea of treating other
CS faculty with the seriousness we deserve is new. There is, unfortunately, a tendency to see computer scientists as if we were programming staff. There are many examples around the world, but an example from recent Uppsala history is the Linnaeus center, where the previous KoF evaluation in our area recommended strengthening the position of the center, which had a very strong track record, but where we now learned that the center has instead been dissolved. This meant of course that bioinformatics was not included in our agenda this time. However we understood that before its dissolution, this center had suffered from a number of administrative obstacles. Started with the idea of doing bioinformatics with true collaboration between a CS leader and a number of biologists, there seems to be a danger that bioinformatics in Uppsala becomes synonymous with software support for the short-range needs of biology projects. In the longer range this will mean wasting a strategic opportunity.

In the case of eSSENCE, we believe that it is essential to bring in computer scientists of several flavors. For example, SciDB is a new development in the database community tailored to the support of scientific calculations. Since simulation of nano-scale phenomena is a critical issue, we expect that bringing in experts in computer simulation would be profitable. Techniques from data mining and machine learning are just two other examples where computer scientists can make first-rate contributions if they are brought into the picture early and supported even when the funding gets tight.

**UPPMAX**

The facility is very well run, but we do not feel it is appropriate to offer a research grade. From our observations, scientists clearly appreciate the service. Their innovation of providing “application experts” is very important and at least partially responsible for their effectiveness. A very well presented and managed service.

**UPMARC**

This is a relatively new Linnaeus center in multicore computing. It is an attractive interdisciplinary center building on the diverse strengths of the department, and we enjoyed the presentation about UPMARC. Two concerned programming general-purpose systems, while one concerned the development of embedded systems. The former is a hot issue worked on in many places worldwide. Upmarc has a novel approach to using object-oriented programming language design for parallelism discovery and exploitation. The work on mapping and scheduling tasks to multicores is extremely timely and UPMARC has a unique opportunity to develop a novel integrated language/runtime and architecture approach which is highly promising.

Designing embedded systems to be run on multicore platform is a hot issue worked on in only a few places. It needs architectural support for performance and predictability. Uppsala University has strong groups in architecture and in performance prediction and analysis and in verification cooperating in
UPMARC. It would be nice to see this cooperation be successful. However, it requires a reorientation of the architectural design goals from optimizing average-case performance to worst-case performance.

Overall UPMARC tackles significant challenges and has excellent potential for growth and international impact.

Other issues

**University support for teaching.** – While the panel considered the teaching load acceptable, administrative overhead of teaching and examination overhead are much too high. The supporting software is poorly designed. It has badly designed security management, for example, which makes it impossible for a teaching assistant or secretary to be used to enter grades. We believe that the core problem is that the IT staff (not to be confused with the IT academic department) does not report to an academic supervisor, at some appropriate level, as they do at most universities. As a result, the staff is a law unto themselves and can produce ill-designed systems and never ask the users what they need.

The rules requiring faculty to produce three exams per year for a single course are counterproductive and a second source of inappropriate load on faculty. At other universities, students are allowed to repeat an exam only for cause, e.g., they were ill during much of the term. When that happens, they sit for the exam with the students in the same course the next year. In that way, only one exam per year needs to be developed.

**Faculty development.** – Inbreeding is still prevalent in the Swedish university system. Research faculty should be encouraged to move between universities early in their career to enhance their experience. The nature of the system is that there is a high average age of faculty. It is hard to hire young, independently minded faculty who are not supported by existing senior people. That might not be a problem in a field that evolves slowly, but the speed of change in CS forces faculty to hire people in fields far from that of existing senior faculty. It should be the department’s responsibility to nurture people in these new areas, even if they do not play into anyone’s current program.

**Course in pedagogy.** – While we do not disagree with the attempt to teach faculty how to teach, we were told that these courses are embarrassing to those who take them. For example, they teach that one should use assessment to measure what is taught in the course, but apparently this course was graded based only on attendance.

**Participation in European projects.** – We welcome the encouragement coming from the senior university administration to faculty to participate in EU projects. In fact, the IT department participates in an impressive number of European projects. However, of the 60% overhead granted by the EU Commission, only 20% overhead is transferred to the project holder. This arrangement is
unacceptable to the faculty. Under-financing results, since the EU Commission reimburses only 75% of the total claimed expenditures; i.e., faculty lose 5% of every Krona they spend through an EU project. This is demotivating prospective participants. The split of the overhead should be such that it encourages participation. The administrative support for applying for, and possibly coordinating EU projects was also noted as problematic.

**Becoming a Complete Department.** – We note that, unlike most classical subjects, CS evolves very rapidly. Since KoF07, entirely new important fields have sprung up, including but definitely not limited to:

1. *Distributed File Systems*, including map-reduce (Hadoop), Hive, PIG, HBase, and variety of large-scale data-management tools have been developed and are in wide use at Google, Yahoo!, Facebook, and the like. We believe this technology will have profound influence on ordinary scientific calculations as well as commercial applications.
2. *Twitter*, which was unknown in 2007. Today it not only is used to overthrow dictators, but it presents many interesting intellectual questions that computer scientists are beginning to wrestle with.
3. *Social Networking* and the analysis of social graphs from Facebook, cellphone companies, and other sources have become both important and challenging to CS research.

Likewise, there are a number of major areas of longer-term interest in which a complete CS department is very likely to have a presence. Among these we number:

2. Security, including malware and software intrusions.
3. Computational linguistics.

All of these areas and others offer an opportunity to hire a young person with the right training and nurture them, either within a program or by the department as a whole.

**Effects of the KoF07-evaluation**
We were largely pleased with the developments since the previous evaluation study in 2007. Especially:

- The IT Department appears to have made great strides in joint management of resources, and it shows in the attitude of the faculty. The Faculty should allow greater flexibility of resources for department strategic goals.
- Likewise, the recognition by the central administration that CS was generally underfunded has apparently been acknowledged and has been addressed to a significant extent. On the other hand it appears that the IT department as a whole does “15% of the work” but receives only 10% of the Faculty’s funding.
- The advice to expand the architecture activity has been acted on and has
already shown significant impact and contributed to the success in attracting the only CS Linnaeus center.

- The advice to hire a professor in embedded systems was followed, and the holder of the chair has added significantly to the capabilities of a number of activities.

- The disposition of the Information Systems Department is both good and bad. One of their HCI people came over to IT and claims to be more effective in this environment. We understand that the department erroneously called “Computer Science” has been abandoned, as the report had suggested should be done. On the other hand, we heard that the social scientists have elected to start their own HCI department with “applications to economics.” Panel 18 in KoF 2011 did not review this activity, and so the issue of how the whole HCI topic is being developed at Uppsala is unclear to us.

- The fate of the Linnaeus Bioinformatics Center was not what was intended and, as mentioned above, looks like a retrograde step.
Scope of the panel’s evaluation: 
Department of Pharmaceutical Biosciences  
Department of Medicinal Chemistry  
Department of Pharmacy

Introduction  
The Faculty of Pharmacy has national responsibility for research and higher education in the fields of pharmaceutical chemistry, pharmaceutical bio-science, and pharmacy. The sphere of activities of the Faculty has great breadth. With its three departments, the Faculty constitutes a dynamic centre for everything relating to pharmaceuticals. Research is organised in the following three major programmes: (i) Drug development; (ii) Drug delivery, and (iii) Drug usage.

Pharmaceutical research and graduate education have close and natural interfaces with the pharmaceutical industry, the national system of pharmacies, and other sectors of health and medical care. Many of the Faculty’s activities are focused on moving forward the frontiers of research and have attracted international attention. The Faculty has extensive international contacts and, together with sister universities in London, Leiden, Amsterdam, Copenhagen, Paris, Parma and Leuven, is part of the ULLA Network for co-operation in research and postgraduate education.

The Faculty has a high priority for research training. The self-stated aim is to prepare PhD students to become independent researchers able to make significant contributions to academia and/or pharmaceutical industry, and to take on highly qualified professional roles.

Department of Pharmaceutical Biosciences

General assessment and Quality of research  
The panel was impressed with the breadth and depth of scientific capabilities and the ambition of the various research groups. The panel recognizes that the current departmental structure arose from the merging of elements from four former departments. During the last year, there has been a focus on reorganizing the department into units based on teaching and research divisions. Some expertise and the research groups resulting from this re-organization appear to lack coherency. Importantly, some research groups within the department may be better positioned elsewhere in the Faculty. As highlighted by the department, a strategic and major opportunity for renewal will occur in the near future as 7 of 13 professors will retire by 2016.
Research is generally conducted at a high quality level within each thematic research group, with all major instrumentation available in modern lab facilities. Some major leaders in their respective fields are found in the department. Research groups include:

**Pharmacometrics**
Rating “Top-quality”. This is a robust, multi-disciplinary, internationally diverse, top-ranked research program that continues to provide a broad vision for how pharmacometrics can be utilized in drug development and therapy. This group is recognized world-wide as the leading program for training pharmacometricians, providing new methods and software for study design and analysis, developing novel models and strategies for data analysis, and generating new knowledge regarding drug therapy, disease and physiology. Intensive interactions with the pharmaceutical industry endorse their strength as a world-leader in this field. This research group already recognizes its own need for a diversified funding portfolio and more interactions among the Faculty.

**Pharmacokinetics and Pharmacodynamics**
Rating “Internationally recognized”. This group has a strong experimental, as opposed to modelling, focus. Drug delivery to the brain remains an important area of research, particularly with respect to the influence of disease on blood-brain-barrier transport and CNS delivery. Application of pharmacokinetic principles to optimize the prophylactic treatment of hemophilia with factors VIII and IX is an excellent example of how clinical pharmacy can improve patient care and decrease health care costs. As discussed below, increased translational/clinical pharmacy research with an emphasis in PK/PD will bring great benefit to the people of Sweden, and represents an important renewal opportunity.

**Neuropharmacology and Drug Addiction**
Rating “Top-quality”. Strength is found in the integrated molecular, epigenetic, behavioral, tolerance and addiction studies conducted on substances of abuse. The interdisciplinary nature of the substance P research program highlights the value, impact and opportunity for collaborative drug discovery within the Faculty.

**Pharmaceutical Bioinformatics**
Rating “Internationally high standard”, although the panel recognizes its collective inability to accurately judge the quality of several components of the group’s research. This initiative in pharmaceutical bioinformatics was considered important as an emerging endeavor. The panel believes that this research group may be more coherently aligned to efforts within the Department of Medicinal Chemistry.
Lipidomics
Rating " Internationally high standard". This group appears to work in relative isolation from the department in a self-contained, albeit successful style, in an area the panel considers is better described as 'metabolism' rather than lipidomics. The current skills and success represent a substantial opportunity as a transforming foundation to produce a collaborative, comprehensive drug metabolism group.

Proteomics
Rating "Top-quality". This group is considered a significant asset to applications of imaging mass spectrometry and pharmaceutical analysis, and to leveraging analogous efforts in the PET center. The panel was impressed with the progress made given the relatively short period since its establishment. The creation of a core pharmaceutical resource at Uppsala in biomedical applications of imaging mass spectrometry is opportune and would best constitute a node of a broader biomedical imaging capability within Uppsala University.

Drug Safety and Toxicology
Rating "Internationally recognized". The panel recognizes the significant contributions made by this group and their external funding record. However, the current programs do not appear to be contemporary with the leaders in this rapidly developing and dynamic field. The panel also noted the significant and positive collaborations with the Proteomics research group.

Department of Medicinal Chemistry

General assessment and Quality of research
The department is divided in three divisions, which differ in size and nature, with chemistry being the common theme across the Divisions of Analytical Pharmaceutical Chemistry, Pharmacognosy and Organic Pharmaceutical Chemistry (which includes the Platform for Preclinical PET). Although these research foci are complementary, the opportunity to leverage these capabilities appears to be under-utilized. The research performance of the divisions within the department is non-uniform. The retirement of two full professors in the near future provides a significant opportunity to bring all divisions to a leading level of performance in their respective fields of research.

Analytical Pharmaceutical Chemistry
Rating "Internationally recognized". The division has a long-standing international reputation in classical drug analysis, especially in chiral analysis including new chiral phases in HPLC and capillary electrophoresis. Since bioanalytics
has become more important, they now seek to move in this direction. The core competence in analytics is the development of separation methodologies. However, to be a powerful partner for other groups in the department and the Faculty, and in order to be able to contribute to new developments in this field, they should intensify their research to cover the range of techniques necessary for metabolomics, especially the informatics surrounding processing of the collected data. This would provide the opportunity to move to a higher level of performance.

**Pharmacognosy**
Rating is not possible and premature at this time considering the recent changes in group structure and its current state of flux. Most recently, one junior scientist has been recruited and the group has substantially redefined their vision of pharmacognosy as a “molecular science that explores nature in search for structure-activity relationships with a drug potential”. The renewal opportunity as a consequence of the future retirement of the current full professor, and implementation of the groups’ contemporary vision, can provide a means to define the cutting edge of research in this field. The panel suggests the group adopt a new, contemporary thematic division name.

**Organic Pharmaceutical Chemistry**
Rating “Internationally high standard”. This division is very strong in organic chemistry, developing new synthetic methodologies including applications of innovative microwave flow chemistry, an excellent method for optimizing reaction conditions and up-scaling. With these skills at hand, they are well-positioned to support and actively contribute to higher level multi-disciplinary drug discovery initiatives. However, aspects of some medicinal chemistry projects were considered iterative and lacking in novelty and innovation. The collaborative development of substance P analogues within the Faculty was viewed as an excellent example of productive inter-group interactions. Due to their diverse skills, the division is well-funded from a variety of sources, supporting a large number of PhD students and postdocs.

**Platform for Preclinical PET (PPP)**
Rating is not possible at this time due to its recent incorporation as a sub-group within the department. The panel commends the university for establishing this significant, discipline-wide technology in a preclinical department which will facilitate translational science. The panel recommends further direction of this resource and its multiple contributions as well as broadening their activities to complement other imaging modalities, perhaps as a university-wide initiative.
Department of Pharmacy

General assessment and Quality of research
The vision of the department is “to contribute to improved health care, to the benefit of individuals and society, by delivering individual research findings and results that can be translated into the development of better and more cost-effective medicines that are used more effectively.” The vision and mission of the department were clearly articulated. The department has a broad research scope including the design, manufacturing, and use of drug products. Several programs in the Department of Pharmacy are conducting cutting-edge research in the field, and are top-ranked world-wide. The department attracts significant external funding for research, and continues to maintain a relatively high level of productivity with respect to intellectual property, the quantity and quality of publications, and the number of spin-out companies. Of note, the department is heavily involved in teaching, although considerable differences exist in the percentage effort devoted to teaching vs. research among its academic staff. Upcoming administrative changes will provide an opportunity for renewal in several important areas.

Biopharmaceutics
Rating “Top-quality”. This translational research program has brought international recognition to the pharmacy Faculty at Uppsala University. The accomplishments of this research group appear to have received less recognition locally than they have internationally. Both product development and successful translation to patients through commercialization of technologies, including patents and spin-out companies, should be prominently highlighted by the university as a successful example of societal engagement. The biopharmaceutics discipline is an extremely important area of research and should continue as a strong component of the department, with appropriate planning to ensure a pipeline of well-trained scientists and future leaders.

Drug Delivery
Rating “Top-quality”. The university has made a strategic investment in the Uppsala University Drug Optimization and Pharmaceutical Profiling Platform (UDOPP), which is internationally recognized as a leading collaborative drug discovery and chemical biology research program. This group has taken full advantage of opportunities for collaboration across departments within the Faculty of Pharmacy, across the university, and nationally. More capability is needed to address research questions from an infrastructure standpoint, and to fully leverage inter-disciplinary opportunities in drug discovery and chemical biology.
Pharmaceutical Physical Chemistry
Rating “Internationally high standard”. The research presented in this area is strong, with a good publication record and productivity, including intellectual property and spin-out companies. However, the science appeared to be making incremental contributions to a well-developed field (e.g., peptide biomembrane interactions). If the group were to work more closely with other laboratories among the academic staff focused in thematic areas, the opportunity to share resources and benefit from the expertise of other academic staff would be enhanced.

Pharmaceutics
Rating “Internationally high standard”. This group continues to make important contributions to its particular field of pharmaceutics, although the output is not as high as it might be because the depth of research, as opposed to breadth of activity, has been a hallmark of this group. New opportunities are apparent in the modelling and simulation of particulate systems in the context of pharmaceutical engineering. As the Chair of this group assumes the role of Dean, the recently recruited and promising young scientists will require mentoring and support for their career development.

Pharmacoeconomics and Pharmacoeconomics
Rating “Acceptable standard”. This field of research has great relevance in terms of healthcare delivery and advancement of the pharmacy profession within Sweden. This is especially the case considering the recent legislative changes to provision of medicines. The output of the group in the context of its defined field appears limited, and future plans and strategies were unclear. Immediate action to enable renewal in this field is highly recommended.

Pharmacy Practice
Unable to rate the group due to its recent establishment. To be successful, this group must be nurtured and supported to distinguish itself by more vigorous and focused research activities within the fields of pharmacy practice and clinical pharmacy.

Faculty research environment and infrastructure
The research facilities across the three departments are extensive, physically complete and modern, with no real needs expressed by either academic staff or students. The student mentoring culture could benefit from consistent department-wide training opportunities that encourage students to take full advantage of diverse cross-disciplinary and cross-departmental training opportunities. Currently, few Faculty-wide social, scientific, training or mentoring events appear to be regularly scheduled. There seems to be little recognition by students that group exchange or regular cross-training within the Faculty (or even within
departments) is both a valuable and reasonable expectation for educational and informational networking. Every effort should be made to make students aware of other groups’ skill sets, expertise, methods, and training opportunities.

The panel noted that junior academic staff within the Faculty was encouraged to develop independent research programs, even though their participation in collaborative research would foster the development of critical mass within a thematic research area. The panel considers that this apparently strict requirement for junior staff to develop their own independent programs may limit their ability to interact or share with colleagues, or mutually mentor students. This also leads to fragmentation into smaller research groups under junior scientists, and a lack of critical mass in any one area of research. The development of independent research programs by junior academic staff appears to reflect the collective Faculty expectation as to the basis for academic promotion. The panel recommends that the Faculty and university consider strategies to address this potentially limiting issue by adopting a more directed approach to career development for young scientists working in interdisciplinary research clusters.

Academic staff consistently expressed the desire to increase both graduate student and postdoctoral researcher populations in order to produce critical mass, increase output and reduce fragmentation. This is commendable but should be balanced against realistic financial capabilities to support such growth and consistent staff populations.

Teaching is heterogeneously distributed across the Faculty and this can create the potential for inequality, perceptions of academic staff workload discrimination, and a pretense for discounting research productivity. A transparent algorithm for assessing workload for all staff according to teaching, research, and service expectations could be beneficial when applied Faculty-wide.

Faculty networks and collaborations

International collaborations and partnerships are prominent, well-supported, and of high visibility. Support for student travel internationally to fulfil research experiences is also excellent, helping promote and commit the Uppsala groups in these international relationships. Inter-departmental and intra-departmental collaborations on campus do not exploit some readily available opportunities to leverage mutual expertise and resources in close proximity. Translational research experiences are more readily observed outside the Faculty and campus.

Opportunities for renewal and emerging science across the Faculty

Governance and organisation. – The panel considers that the current structure of the Faculty, and the governance model currently employed within the Disciplinary Domain fundamentally constrains the development and advancement of the individual departments, the pharmacy discipline, and the overall Faculty of Pharmacy at Uppsala University. The panel recommends that the Heads of
Department report directly, and only, to the Dean of the Faculty of Pharmacy. The Dean must be responsible for the strategic direction, teaching mission, research profile and overall success of the Faculty’s programs. In this proposed model, the Dean should report directly to the Vice-rector of the Disciplinary Domain. The panel expects that implementation of the following recommendations is the responsibility of the Dean, with new financial support (KoF11 funds).

In the context of Faculty-wide renewal and the implementation of a new administrative structure and governance model, several options are immediately apparent that could enable a coherent realignment of activities to provide an optimal structure. Three possible options for consideration, representing a continuum of opportunity, include:

1. At a minimum, current skill sets and research capabilities should be consolidated and realigned in a more coherent manner to better support the missions of each of the three current departments. For example, the panel suggests that bioinformatics be moved into the Department of Medicinal Chemistry, and that PK/PD and Pharmacometrics be moved into the Department of Pharmacy. Other opportunities for realignment also exist, and these should all be considered on a Faculty-wide basis in line with a new Faculty strategic plan.

2. Create a new and 4th department within the Faculty that would be responsible for research and teaching in the area of Pharmacy Practice and Outcomes Research. This initiative could be achieved rapidly by moving current research groups such as Pharmacometrics and PK/PD into this new department, and also supporting the significant renewal of current disparate activities in the field of pharmacy practice and clinical pharmacy.

3. The Faculty may consider it advantageous to eliminate all department boundaries to foster higher level and multi-disciplinary research outcomes. To enable this attractive opportunity, the Faculty may choose to strategically focus all research activities in an institute-like structure. Indicative titles for such institutes might include (i) The Uppsala University Institute of Pharmaceutical Sciences, and (ii) The Uppsala University Institute of Pharmacy Practice, with both groups remaining within the Disciplinary Domain of Medicine and Pharmacy. Cognate research capabilities currently outside the Faculty of Pharmacy should be considered for inclusion in these two proposed institutes.

**Strategic planning and hiring of new professors.** – In parallel with the assessment and consideration of the three options described above, there is an immediate need for strategic planning across the Faculty. Due to the retirement of a large number of full professors within the next few years, the opportunity for renewal is exceptional.

The strategic planning at a Faculty level, in the context of the governance and administrative model proposed above, should consider realignment/re-as-
assignment of research groups, expertise and research efforts into complementary clusters of critical mass. This would naturally consider the future requirements of the Faculty in the changing educational and research context facing the academic staff and the profession.

New professors should not be appointed until future appointments are considered within a whole-of-Faculty context and assessed against the strategic intent and research and education needs of the overall Faculty.

The current default model of academic staff succession by “junior protégé inheritance”, or by in-house promoted professors, has inherent limitations. These can include a lack of novelty, an inability to rapidly move into new areas of research, and limited opportunities for contemporary and thematic change. This comment is not a negative reflection on the quality of the “junior protégés” or promoted professors. Rather, these recommendations are provided in the context of strategic planning for Faculty-wide human resources.

Many talented female staff are engaged in research and teaching across the Faculty. Gender imbalance, with a bias towards males, was apparent among senior versus junior scientists, and also in major research funding success. While this situation may not necessarily be unique to Uppsala University, career advancement must remain independent of gender and focus on academic performance and achievements.

Clinical Pharmacy. – This field represents an unprecedented renewal opportunity at both the Faculty and professional level. Contemporary pharmacy practice dictates that patient counseling, medication therapy management, individualized drug therapy, and the quality use of medicines should be available to all patients as a minimum standard of pharmaceutical care. Immediate action, led by the Faculty in a Swedish context, is necessary to enhance health care delivery throughout the country.

At a minimum, certain components of the foundational sciences (e.g., pharmacokinetics/pharmacometrics, social pharmacy) that support clinical pharmacy might be realigned and subsequently strengthened with practice-oriented research-active academic staff. These individuals are necessary to teach the next generation of Swedish pharmacy practitioners to deliver pharmaceutical care and information about proper medication use to their public. Contemporary research in this field includes examples of pedagogy, educational and learning outcomes, and translational clinical research in important therapeutic areas (e.g., cancer, diabetes, metabolic disease therapeutics, pediatrics, and geriatrics) that currently are not evident in the Faculty.

Progressive clinical pharmacy practice requires continuing pharmacy education for registered pharmacists in Sweden. This represents a timely action, as well as a professional obligation and financial opportunity for the Faculty. The panel recommends that the Faculty consider redeployment of current resources to address this essential need.
Research platforms. – The panel identified the opportunity for both university-wide and Faculty-wide research and infrastructure platforms to facilitate collaborative research. This optimizes resource utilization and economy. For example, the current Uppsala University Drug Optimization and Pharmaceutical Profiling Platform (UDOPP) is an excellent and progressive initiative that will enable future collaborative, high impact programs.

Extension of this model to new university-wide efforts could immediately include an enhanced Biomedical Imaging Capability/Platform to integrate several developing technologies including PET, imaging MALDI, MRI and various photon-based imaging methodologies around biomedical applications. In a Faculty-wide context, comprehensive research platforms could include newly organized core facilities that would consolidate existing instrumentation and expertise as core campus resources.

Coordination and integration of core facilities across Uppsala University would produce attractive financial benefits, as well as improved efficiency in resource visibility, utilization, and management. The panel recognized immediate opportunities in the following specific core capability/platform areas: (i) analytical mass spectrometry, (ii) peptide-based drug programs, and (iii) metabolomics. The panel noted that the prior request for a proteomics/imaging mass spectrometry core facility should be implemented.

Collaborative biomedical research activities at Uppsala University. – Considering the collective resources and capabilities across the departments in the Faculty, prudent re-assessment of collective expertise, research areas and departmental alignments represent a timely renewal opportunity. Synergies and collaborative relationships are present, but should be enhanced substantially, both within the Faculty of Pharmacy, and across the Faculties of Pharmacy and Medicine.

Expanded and integrated “modelling and simulations” capabilities across the three current departments could include coordinated efforts in bioinformatics, proteomics, pharmaceutics, pharmacokinetics/pharmacodynamics, and pharmacometrics. Indeed, a deliberate plan for more interactions would leverage these strong capabilities and position the Faculty and the researchers to further define this field. Even greater success could result as changes in society demand collaborative science, mandating even closer synergy and cooperation with these groups and other research constellations at Uppsala University.

The panel suggests that a pool of KoF11 research funds be made available, on a competitive basis over the next four years, to seed collaborative, interdisciplinary research activities within the pharmaceutical and biomedical sector at Uppsala University.

Opportunities for research activities within therapeutic themes. – Transformative science often occurs at the interface of disciplines. Pharmaceutical science lies intrinsically at the intersection of several relevant biomedical areas. The
panel proposes that the Faculty develop integrated, comprehensive discovery programs addressing a therapeutic theme. Such a programmatic approach would favorably position Uppsala University for high level, high profile external funding opportunities (e.g., EU, NIH, Wellcome Trust, Gates Foundation, and the new Swedish Governmental Strategic Plan).

- **Neurotherapeutics:** A program including the neuropharmacology, blood-brain-barrier, advanced and innovative brain imaging of drug delivery, metabolism, and toxicities using both mass spectrometry and PET, modelling, pharmacokinetics/pharmacodynamics, and partnering (e.g., Karolinska Institutet experts) appears a compelling opportunity.

- **Drug Safety Research Program:** Priorities on this high-profile topic need to be improved and consolidated into a single and substantial group. This should have an evident common goal that considers contributions from the collective future activities for pharmaceutical bioinformatics as well as drug safety and toxicology, and perhaps a transformed drug metabolism research group.

**Uppsala University Distinguished Professorships.** – Senior academic staff with exemplary records of international research accomplishment and recognition were identified by the panel as most deserving of named, distinguished professorships consistent with those awarded in other countries. The panel recommends that consideration be given to dedicating some KoF11 funds to implement such positions.

**Effects of the KoF07-evaluation**
Several new department staff were recruited arising from the KoF07 recommendations and they have performed admirably to become significant department assets and research scientists. These staff, and their positions, should be solidified into permanent positions, thereby setting an important example of how exceptional performance garners stability and recognition. These staff should be supported further with new resources to ensure their future success.

**Conclusion**
The panel emphasizes the golden opportunity that currently exists for transformational change within an already high-performing, internationally regarded Faculty. Our recommendations have been specifically crafted recognizing both the timing and unprecedented opportunity to make major change that will positively impact this top-ranked program for decades to come.
Scope of the panel's evaluation:
Department of Medical Cell Biology
Department of Medical Biochemistry and Microbiology

Department of Medical Cell Biology

General assessment of the department
The department of Medical Cell Biology has been extensively renewed since 2007. Important changes include a reduction of the number of chairs (from four to one) and an increase in the number of promoted professorships (from eight to ten. More importantly, the number of external positions has increased from one assistant Swedish Research Council (VR) professorship in 2007 (Tengholm) to five external positions (Tengholm, Phillipson, Palm, Barg, and an EXODIAB postdoc) in 2011. However, this increase is also a source of concern because in the future no VR positions will be granted. Although Uppsala University guarantees a further two years of support, the future after about 2015 is uncertain. The available laboratory space, although only two-thirds of that present in 2007, appears sufficient and is currently well equipped with modern apparatus. Expensive equipment that is used with low intensity (electron microscope, etc.) would be best placed and maintained in a core facility. Although the total number of junior faculty has not changed much, their composition has altered considerably, the number of postdocs increasing from 6 to 20, and the number of PhD students decreasing from 34 to 16. There are now 8 technicians versus 12 in 2007. The department had a positive financial reserve at the end of 2010. Moreover, an FP7 collaborative project (Beta-JUDO) has very recently been awarded to Bergsten of which € 2 million will flow to the department. Some of this positive reserve will be invested in equipment but it may be prudent to also reserve some for bridging gaps in funding for promising professors on external positions.

The remarkable improvement of the Department of Medical Cell Biology, with condensation accompanied by new recruitments and developments, may to a large extent be credited to the conscientious efforts of the present chairman, Professor Erik Gylfe, and at an early stage also to the former chairman, Professor Arne Andersson. The panel was pleased to see that the KoF07 report guided several of these changes.
Angiogenesis and Inflammation

A key development since 2007 is the accentuation of islet transplantation, consistent with the advice provided in KoF07. This is manifested by work of the Carlsson group that is focusing on islet perfusion and optimizing islet transplantation. Intramuscular islet transplantation appears to be more successful than intraportal islet transplantation, probably because of better islet perfusion. An open prospective randomized islet transplantation trial to study this in patients is being initiated. Underlying mechanisms are under investigation. One promising concept is that angiogenesis is supported by migrating leukocytes. This theme is being creatively explored by the Phillipson group. Inflammation creates a chemokine gradient that attracts angiogenic leukocytes. Moreover, intravascular crawling behavior of leukocytes is perpendicular to flow in search of CD31-positive junctions through which transmigration towards extravascular chemokines occurs. In collaboration with the Jin-Ping Li glycobiology group at IMBIM it was recently shown that this gradient is maintained on the endothelium by heparan sulfate. The collaboration between these two groups at Medical Cell Biology and IMBIM should be fostered (see below). The Phillipson research line is supported by a new intravital spinning disk confocal microscope. An exciting idea is to deliver chemokine-coding plasmids into muscle in order to bioengineer the site of islet transplantation. The islet transplantation activities by the groups of Per-Ola Carlsson and Mia Phillipson are of high international standard.

Bacterial invasion of the gut wall is prevented and regulated by epithelial secretion of mucus in response to bacterial products. This is disturbed by dextran sodium sulfate (DSS), a model of colitis. The process is studied by an intravital microscopy set-up. However, how DSS precisely affects composition of the mucus layers could be further elucidated if collaboration was established with the glycobiology group at IMBIM. The studies of colonic mucosal barrier by the groups of Lena Holm and Mia Phillipson are deemed to be of high international standard.

The group of Michael Welsh studies shb-dependent signaling. Multiple pleiotropic effects of the SH2-domain adapter protein operating downstream of tyrosine kinase receptors are examined in the Shb−/− mouse. Collaboration has been primarily outside Medical Cell Biology, but is now developing with other groups within Medical Cell Biology (Phillipson, Tengholm, Barg, and Wentzel). The work is internationally recognized.

Ingela Parmryd studies plasma membrane organization. This work on cell membrane organization has no connection with other work at the Department of Medical Cell Biology in Uppsala. In fact, all publications up till the present are from the Wenner-Gren Institute at Stockholm University. This project is internationally recognized.

Part III: Panel Reports
Kidney Pathophysiology

The hypothesis of the Palm group is that in the diabetic kidney hyperglycemia leads to an increase in oxygen consumption because of increased solute delivery to the tubules secondary to hyperfiltration. In conjunction with reduced blood perfusion under influence of nitric oxide (NO) deficiency this leads to a reduction of oxygen tension throughout the kidney that drives renal damage. Importantly, a compensatory response by the HIF system is not mounted in the diabetic kidney. Translational research in conjunction with the department of radiology at the University Hospital in Uppsala shows with BOLD MRI that renal hypoxia is also a feature of diabetes in humans.

The group is technically very advanced in quantitating oxygen in vivo. The hypothesis of the Hansell group is that a decrease of hyaluronan content in the renal papilla accompanies urinary concentration. This appears to be effect rather than cause. Precise mechanisms are unclear and could be further elucidated if collaboration was established with the glycobiology group at IMBIM. The Persson group continues their internationally well-known work on tubuloglomerular feedback (TGF). Disturbances in TGF may underlie salt sensitivity of blood pressure. Conceivably this could be combated by supporting NO production. Blood pressure regulation in chronic renal failure is invariably salt sensitive. However, translation to the clinic is hampered by lack of collaboration with physicians treating patients with chronic renal failure at local hospitals. Emeritus Professor Persson, who is a highly respected and appreciated mentor for all the Junior Faculty and Staff at Medical Cell Biology, has recently been awarded a VR (Swedish Research Council) renewal of his grant. Professor Persson’s profound knowledge of classical physiological techniques currently provides a complement to the molecular biological approaches. However, Professor Persson’s chair was not continued, and his position has not been replaced at present. The Nordquist group explores the role of uremic toxins originating from the gut such as indoxyl sulfate in the progression of chronic kidney disease. Results in rodent models look promising, and will be followed up by inhibition of tryptophan synthesis. However, once again translation to the clinic is hampered by lack of collaboration with local hospitals. Kidney Pathophysiology by the group of Fredrik Palm, Peter Hansell, Erik Persson, and Lina Nordquist is deemed to be of high international standard.

Islet Physiology and Type 2 Diabetes

The department has a long history of successful research on islets of Langerhans and their secretion mechanisms and role in diabetes. Following KoF07 the department has considerably strengthened its islet research by the appointment of Sebastian Barg and Gunilla Westermark. Barg’s expertise is in islet electrophysiology and complements well the cell imaging methods employed by Anders
Tengholm. Gunilla Westermark has an international reputation for outstanding work on islet amyloid.

Anders Tengholm described the work being carried out by himself and by Sebastian Barg. Tengholm’s group has developed a technique for measurement of cAMP levels in the subplasma membrane space of single cells (cAMP$_{pm}$). Using evanescent wave fluorescence imaging he has been able to perform parallel measurements of cAMP$_{pm}$ and Ca$^{2+}_{pm}$ in the β-cell subplasma membrane space and PIP3 in the β-cell plasma membrane. He has shown that the formation of PIP3 in the plasma membrane can be used as an indicator of insulin secretion. The results demonstrate that glucose induces coordinated oscillation of cAMP$_{pm}$, Ca$^{2+}_{pm}$ and PIP3. Most importantly it was demonstrated that although protein kinase A has a role to play in initiating glucose-induced insulin secretion, the major amplifying effect of cAMP on secretion is mediated by the guanine nucleotide exchange factor Epac. This is a crucial advance in understanding control of insulin secretion by glucose. Recently the Tengholm group has made a further important contribution by devising a method for measuring changes in intracellular ATP concentrations in single cells. Since ATP is a key trigger for insulin secretion acting via closure of ATP-sensitive K-channels, this new technique will be of great value. These methods can also be applied to the other cell-types in the islets of Langerhans and Tengholm is providing new information on the control of secretion of glucagon, somatostatin and pancreatic polypeptide.

The panel was particularly pleased to note that availability of human islets of Langerhans from the islet transplantation centre is being well utilized to permit the important conclusions from work on rodent islet and cell lines to be verified in human islet cells.

Sebastian Barg’s group is also of international high standard. They are using electrophysiological techniques together with advanced light microscopy and fluorescent imaging to investigate the molecular mechanisms of exocytosis. Insulin is stored in secretory granules, which, on stimulation by an increase in glucose concentration, move to and dock with the plasma membrane before discharging their contents via exocytosis. These processes are not well understood at the molecular level. Barg is investigating the hypothesis that proteins important for the docking process pre-assemble at local hot spots in the plasma membrane. Key players in the process are believed to be the SNARE proteins syntaxin, SNAP25 and synaptobrevin and Barg is able to follow the movements of individual protein molecules during the docking process. These are fundamental cutting-edge studies.

Gunilla Westermark’s group has an international reputation for their work on cell-toxic islet amyloid. The major component of amyloid found in the islets of Type 2 diabetic patients is the hormone Islet Amyloid Polypeptide (IAPP). IAPP is synthesized as a precursor, pro-IAPP, which is converted to IAPP within the secretory granules by the prohormone convertases PC2 and PC1/3. A problem for research into amyloid formation is that rat and mouse do not form...
IAPP-amyloid owing to sequence differences in the IAPP. Several strategies have been developed to circumvent this; the Westermark group has a human IAPP transgenic mouse strain which develops amyloid in response to a high-fat diet. The panel was impressed to hear of the development of an additional model – a Drosophila melanogaster transgenic expressing human IAPP. This exciting model will permit key studies on many aspects of amyloid formation including the mechanism by which cells are killed, and will also be useful in analysis of inhibition of amyloid formation. The Drosophila system may also be a useful model system for other investigators in the department and may lead to further fruitful collaborations.

An important finding by the group is that amyloid formation often occurs in transplanted islets of Langerhans; this may be a key observation in understanding why islet transplants often fail in the long run. Thus, the on-going studies by the Westermark group are of major importance both with regard to β-cell failure in Type 2 diabetes and in improving islet transplant success.

Peter Bergsten’s group is carrying out interesting work on β-cell function in Type 2 diabetes and obesity. The aim is to find new therapeutic procedures to reduce the rise in obesity-related Type 2 diabetes. Two basic findings underpin the approach. The first is that the elevated plasma fatty acid levels associated with obesity have a deleterious effect on β-cell function involving both altered fat metabolism within the β-cell and increased apoptosis. The second finding, which is novel, is that the deleterious effect of palmitate on isolated human islets is preceded by increased sensitivity of insulin secretion to a rise in glucose concentration. Bergsten has obtained evidence that this phenomenon also occurs in vivo using obese subjects from the Uppsala Longitudinal Study of Childhood Obesity. The hypothesis proposed is that this initial hypersecretion of insulin, which leads to increased fat synthesis, is a key factor in precipitating obesity and subsequent death of β-cells in Type 2 diabetes.

Considerable funding has been obtained for a large multi-centre trial (beta-JUDO) to be coordinated by Uppsala. The project will involve clinical work characterizing 3000 juvenile obese subjects in terms of OGTT and brown adipose tissue function and identification of genes correlating with insulin hypersecretion; preclinical studies on isolated β-cells; and an interventional trial to seek ways of normalizing the insulin hypersecretion and thereby the development of obesity and diabetes. This is an ambitious project which if successful should be of considerable importance.

The panel rated the work in Medical Cell Biology on Islet physiology and Type 2 diabetes as being of internationally high standard.

Type 1 Diabetes

Nils Welsh presented aspects of his own work and that of Stellan Sandler on the etiology of Type 1 diabetes and, briefly, the studies of Ulf Eriksson and Parri
Wentzel on diabetes-induced malformations. Welsh and Sandler investigate the mechanisms involved in β-cell destruction in Type 1 diabetes. The aim is to devise procedures to protect against β-cell damage and if possible to discover means to regenerate β-cells. Several animal models are used including the NOD mouse, multiple low dose streptozotocin (MLDS) administration; recurrence of disease in transplanted islets; and the bank vole. The latter animal exhibits spontaneous diabetes and the causative agent is a picornavirus, Ljungan virus.

The N. Welsh group has for many years carried out interesting studies on the role of tyrosine kinases in β-cell apoptosis and diabetes. His presentation focused on current studies on the possible use of the tyrosine kinase inhibitor Gleevec (Imatinib) in treatment of Type 1 diabetes. Gleevec is a derivative of 2-phenylaminopyridine which has had dramatic success in the treatment of chronic myelogenous leukaemia (CML). Its mode of action is to inhibit specific tyrosine kinases, in particular the Abelson proto-oncogene abl, c-kit and PDGFR. In CML the fusion protein of abl with bcr results in a constitutively active tyrosine kinase, bcr-abl; inhibition of bcr-abl by Gleevec is the basis for its therapeutic action. The relevance of this to diabetes is that the Welsh group and other groups have shown that Gleevec reverses Type 1 diabetes in several animal models of the disease. These findings have led Welsh to propose clinical trials of Gleevec in new-onset Type 1 diabetic patients; a grant application for such a trial is awaiting decision. The panel had some reservations about the direction the research has taken. Gleevec has multiple actions and although licensed for use in relatively rare diseases such as CML, its cost and possible side-effects cast some doubt on its potential use in a disease as wide-spread as Type 1 diabetes. Moreover, since several other groups are also pursuing similar work it is unclear how competitive the Welsh group would be. Nevertheless, further studies on the protective effect of Gleevec on β-cell function in animal models of diabetes will be very worthwhile. Although the work carried out is of interest the panel felt that the present activities were not as impressive as those reviewed during the previous evaluation (KoF07). Apparently, there have been practical problems with animal husbandry that partly explain this reduction in productivity.

Stellan Sandler’s work overlaps to a considerable extent with that of Nils Welsh in that he is also studying mechanisms of β-cell destruction and regeneration. He has shown protection against MLSD-induced diabetes by a statin (Simvastatin), an effect not apparently mediated via a lowering of cholesterol. In an alternative approach IL1-Trap has been shown to improve graft survival in transplanted islets. And a third strategy demonstrated that a mitochondrial K-channel opener protected against β-cell death in vitro in response to streptozotocin. These findings all have possible therapeutic value. However the panel felt that possibly too many alternative approaches were being simultaneously pursued – it may be more productive to narrow the focus of the research. This is particularly so, in view of Sandler’s recent important administrative responsibilities.
Welsh also referred to the work of Ulf Eriksson and Parri Wentzel on diabetes-induced malformations. However, only a single slide was shown and the panel members were unable to form a clear picture of this work which seems to lie somewhat outside the other on-going studies. It was suggested that the fact that the malformations linked to 7 loci on 5 separate chromosomes yields a number of candidate genes. However, since the department is not geared towards wide-scale genetic analysis studies it was not really obvious to the panel where this work was leading.

Per-Ola Carlsson presented the work carried out by himself and Leif Jansson. Carlsson is a senior physician in diabetology at Uppsala University Hospital. His appointment as a full professor in Experimental Endocrinology at the Department of Medical Cell Biology was a valuable consequence of KoF07 and has considerably strengthened the research effort of the department as well as extending the translational aspects of the department's work. Carlsson now leads one of the largest groups in the Department of Medical Cell Biology and is supported by a number of large grants, both national and international. The group has research activities at both the Department of Medical Cell Biology (BMC) and the Department of Medical Sciences (Uppsala University Hospital) and the islet transplantation studies also involve collaboration with Mia Phillipson. The presented studies emphasized the importance of the islet vasculature for the normal function of the islet, an important concept that has not always been properly recognized. Carlsson and Jansson have shown that the loss of function of islets transplanted to the liver, the most usual site used so far for transplantation, is partially attributable to poor re-vascularisation. They have made the important discovery that in contrast to liver-engrafted islets, islets transplanted to striated muscle are extremely well re-vascularised and preserved well their secretory capacity; the results with mice were confirmed in a human patient receiving auto-transplantation of islets. These are interesting and potentially very important studies, as attested to by the large amount of funding they have generated.

The group is also carrying out experimental and clinical studies on the application of stem-cell therapy to expand residual β-cells in Type 1 diabetic patients. An open randomized pilot study into the use of autologous mesenchymal stem cells is currently underway funded by EXODIAB.

The panel felt that the mixture of clinical and experimental work carried out by Carlsson and Jansson was of an excellent standard. Overall we have rated the work in Medical Cell Biology on Type 1 diabetes of internationally high standard.
Department of Medical Biochemistry and Microbiology (IMBIM)

General assessment of the department
The IMBIM remains a very strong department, as it was in 2007. However, there is some change of emphasis. The unit of Functional Genomics has emerged as a world leader in its field showing very exciting progress, especially with regard to the genetic characterization of phenotypic traits of large domestic animals. The successful recruitment of the outstanding Professor Kerstin Lindblad-Toh, as Director of SciLifeLab-Uppsala, and the deeply impressive recent investigations of Professor Leif Andersson, have been important factors of this major team achievement. By contrast, the well-known Glycobiology unit appears to undergo a period of consolidation. Another world-leading section in the department is that of Bacteriology under the direction of Professor Dan Andersson, which focuses on the important problem of emerging resistance to antibiotics. The panel notes the international acclaim of this research, and the accompanying substantial funding. However, the success of IMBIM apparently has not yet been supported by prestigious grants from the ERC. Two slightly smaller units in IMBIM have also made remarkable and very satisfactory progress since the KoF07 review, that is, the units of Tumor Biology and Protein Chemistry. Finally, serious attempts to strengthen the Immunology section by transfer of staff have been carried out recently.

Functional Genomics

The Comparative Genomics research area is organized in five groups, covering functional, comparative and bioinformatics genomic research. The two main leaders of the program, Professor Leif Andersson and Professor Kerstin Lindblad-Toh, have been extremely successful in using high-throughput biology to study clinical phenotypes of domestic animals. Lindblad-Toh leads a very fruitful program that uses dogs as models for human disorders and has identified a number of loci and genes underlying both monogenic and multifactorial disorders. Investigations lead by Andersson use chicken, pig, dog and horse to identify genes controlling phenotypic traits and disorders. The two groups complement each other extremely well, bringing expertise and know-how at different levels.

The Comparative Genomics area has recently recruited Dr. Matthew Webster as a new group leader in computational biology, and Dr. Patric Jern, an assistant professor, with a strong competence in bioinformatics with particular reference to retroviral sequences. The unit is recruiting another group leader in bioinformatics (Manfred Grabherr) through funding from the SciLifeLab-Uppsala initiative. These new incorporations provide a very comprehensive shaping
of the multidisciplinary capacities of the program. The unit also has Dr. Pernilla Bjerling, who works on chromatin organization in yeast. The panel thinks that the research activities of this group are important, but that the investigator could integrate better as part of other research groups in assessing functional genomics of new molecules identified in the exciting research achievements of the whole unit. Perhaps the SciLifeLab platform could provide the right framework for this investigator. The global assessment of the Unit is of outstanding science of top international level.

The Comparative Genomics area has made outstanding achievements in identifying key genes controlling phenotypic traits and disorders in chicken, pig, dog, cow and horse. Many of these discoveries will easily translate into human diseases and general knowledge about human genetics. The main investigators of the unit, Andersson and Lindblad-Toh, are world leaders in the field of functional genomics of domestic animals research. The publication record of Andersson is deeply impressive with papers in the best top-ranked journals. Similarly, Lindblad-Toh has achieved an outstanding scientific production with leading papers in the genomics of many organisms and in comparative studies of the genomes of several mammal species, all published in the best scientific journals. The new recruitments of the unit, Webster and Jern, have been an excellent asset and are likely to become key members of the scientific activities of the unit, with many implications for the research of other groups of the department and life sciences in Uppsala University.

The panel recognizes that the world leading position of the investigators of the unit and the singularity of their research is an excellent opportunity for Uppsala University. This has already been seen by the funding agencies by placing the SciLifeLab-Uppsala initiative under the direction of Lindblad-Toh. However, the panel considers that there is here a unique opportunity to make Uppsala a leading place in the world in this field of research. This could be achieved by giving the unit a pivotal role in the constellation of excellent research in the field of life sciences in different departments. The impression of the panel was that several investigators of the department recognize the opportunity of this constellation of leading activities by Andersson and Lindblad-Toh. Therefore, a potentiation of the unit with an additional group leader in comparative functional genomics could enhance further the ongoing activities with synergistic implications for other groups. The panel strongly supports the activities of the SciLifeLab-Uppsala initiative in building a research framework that brings together investigators of Sweden in a research environment that facilitates synergism and collaborations. The continuous support to the genomic infrastructures of SciLifeLab-Uppsala is a key element for this successful initiative.

The Uppsala Comparative Genomics area (Andersson and Lindblad-Toh) has a major role in the European LUPA project that coordinates world-leading genomic activities that uses the dog as a model organism in genomic research. In addition, Lindblad-Toh is leading or co-leading over 10 mammalian/vertebrate sequencing consortia. The involvement of the Uppsala investigators in
these consortia is of leading activities in gene discovery, genome annotation and functional studies.

The panel strongly recommends the continuous support to the functional genomics of domestic animals research activities. The newly recruited faculties have made an excellent impression on the panel and their prospect for success in the unit is high as pivotal members in the unit activities. With the large amount of data that is being produced in the large-scale sequencing projects in which the Comparative Genomics area members are involved, it becomes clear that computational biology is an essential area for which new scientists are needed. Therefore, this is an area that is emerging as essential in the activities of the unit, and it will also be for other members of the department. The panel thinks that the unit has achieved an outstanding research quality with the leadership of Andersson and Lindblad-Toh. Their world-leader capacities and the excellence of their research are the best assets for the continuation of the functional genomic activities at Uppsala University. The panel considers that there is an excellent opportunity for Uppsala University to become the world-leading center in functional genomics of animal model research. There is probably no other center in the world that has this potential. Therefore, a potentiation of the unit with an additional group leader position in comparative genomics should enhance further the strength of the ongoing activities and their consequences at the international level.

The KoF07 evaluation recommended the recruitment of Lindblad-Toh and other actions to foster the development of comparative genomic activities at Uppsala University. Most of these recommendations were very well implemented and this has been further translated and materialized with the SciLifeLab initiative and the creation of different high-throughput biology scientific platforms. The leaders of the unit have an excellent track record in training students and postdoctoral fellows. The quality of their research is crucial in attracting the best students and scientists. Building a MD/DVM PhD program would further take advantage of the excellent research activities of the members of the unit. The research field of the Comparative Genomics area is an excellent arena to bring research close to society. The leaders of the unit are excellent communicators of science and should be able to translate their activities into a positive view of genetics and genomics to the public. The SciLifeLab initiative could take an active role in bringing their activities closer to society, by taking care of the ethical and social issues of genomic research.

Glycobiology

The Glycobiology Unit under supervision of Professor Lena Kjellén successfully continues innovative research on proteoglycans initiated at Uppsala University by Torvard Laurent and Ulf Lindahl. The discovery of a plethora of functional roles of proteoglycans over the last decade has made their study an emerg-
ing and promising field with great functional and regulatory significance in all aspects of cell biology and human diseases. The intricate structure of different core proteins anchoring one or more glycosaminoglycan (GAG) chains of various subtypes giving rise to an enormous molecular diversity, provides the structural basis for a multitude of biological functions, such as organizing extracellular matrix assembly and regulating growth factor and cytokine signaling. Furthermore, proteoglycans themselves appear to bind to many cell surface receptors with high specificity, thereby activating signaling pathways, which control cell proliferation, differentiation, adhesion, and migration. The unique expertise of the IMBIM Glycobiology Unit regarding heparan sulfate (HS) biochemistry resulted in pioneering work addressing the questions how cells decide on the particular design of HS and what is the underlying mechanism of their biosynthesis. To answer these questions HS biosynthesis enzymes and their interactions have been analyzed resulting in a novel concept of “GAGosome” describing the orchestration of HS biosynthetic enzymes. The IMBIM glycobiology group identified four genes coding for glucosaminyl N-deacetylase/N-sulfotransferase (NDST). Importantly, since KoF07 the joint efforts of the groups of Lena Kjellén, Jin-Ping Li, Dorothe Spillmann and Johan Kreuger succeeded in translating the chemical and molecular knowledge regarding HS synthesis into its biological relevance in embryogenesis, tumorigenesis, angiogenesis, inflammation, and amyloidosis. This was achieved by: i) creating a team that is collaborative and specialized in diverse aspects of proteoglycan chemistry and biology and by ii) applying new sensitive methods to determine GAG concentrations and structures, cell-lines lacking or overexpressing HS biosynthetic enzymes, transgenic mice and new zebrafish and C. elegans in vivo models.

The research of the IMBIM Glycobiology Unit is highly estimated in the field of proteoglycans. The unique expertise regarding biosynthesis of HS and sensitive methods to measure concentrations and GAG modifications makes the group very attractive for international collaborations. This resulted in 73 publications in high impact factor journals since the last KoF07 evaluation. The work of the group has been recognized continuously over the years by inviting the group of Lena Kjellén and Jin-Ping Li to present their recent data at the Gordon Research Conferences on Proteoglycans and the International Conferences on Proteoglycans (frequently in the sessions of recent breakthroughs). The national recognition of the unit can be illustrated by the fact that the Swedish MediGly network is coordinated out of Uppsala by Lena Kjellén.

The group of Lena Kjellén continues its very interesting work on the assembly of HS biosynthesis enzymes into modifying units, “GAGosomes”, which depending on the unit composition determines the outcome of HS biosynthesis. It is of note that the group successfully moved their research interest from biochemical analysis of HS synthesis towards the medical and biological importance of each HS synthesis step. Since the KoF07 evaluation, mice lacking various NDSTs were analyzed in a number of biological contexts. Recently, the interest of the group has been further expanded into the role of sulfate...
metabolism in cancer metastasis. This might be a good opportunity to intensify collaborations with the Tumor Biology Unit. The extension of in vivo models to zebrafish and C. elegans will even further improve the quality of the research within the unit. Of particular international interest and estimation is the work of the group of Jin-Ping Li addressing the role of HS metabolism in inflammation, tumorigenesis and amyloidosis with a particular focus on glucoronyl CS-epimerase (Hsepi) and heparanase. From gene cloning (Glce) and enzyme purification to generation of mice lacking this enzyme the role of Hsepi in embryonic development has been systematically characterized. By generating mice either lacking or overexpressing heparanase the role of HS in various amyloidogenic diseases (Alzheimer’s disease, type II diabetes mellitus) is being analyzed. The group of Jin-Ping Li is regularly invited to present its innovative work at international meetings on proteoglycans. Jin-Ping Li is also involved in organizing committees of International Conferences on Proteoglycans. The latest publication on the role of HS in transthyretin fibrillisation (Proc. Natl. Acad. Sci. USA, 2011) is a good example of the high level achievements of the group. Besides various international collaborations the group supports other groups of IMBIM and in the Department of Medical Cell Biology. Thus, the panel strongly suggests to further support the work of the Jin-Ping Li group and to promote this talented group leader adequately.

The recruitment of Dorothe Spillmann (associate professor), a result of the KoF07 evaluation, further focused and intensified the work the Glycobiology Unit on: i) characterization of HS-protein interactions, ii) the impact of HS on growth factor-induced cell stimulation, iii) the impact of GAGs in tissue regeneration, and iv) translational HS-related research. Furthermore, the group developed a specific and sensitive method for the estimation of GAG structures in small tissue samples, which is a very important step forward for the field of glycobiology. Besides various international collaborations, the group is well integrated within the IMBIM. Thus, the incorporation of the group of Dorothe Spillmann is a considerable gain for the Glycobiology Unit.

The group of Johan Kreuger (assistant professor) is working on the effects of molecular gradients on angiogenesis and the role of HS proteoglycans in modifying growth factor signaling and maturation of vessels. Furthermore, the group is involved in the development of new techniques to study these processes. The development of a fluid device for generation of molecular gradients in three-dimensional cultures of tissues resulted in starting of a new company, Gradientech, and submission of two patent applications by Johan Kreuger. This young scientist successfully developed national and international collaborations and published in high impact factor journals (e.g. EMBO J., 2010).

The group of Cecilia Annerén (senior scientist at GE Healthcare and adjunct associate professor at IMBIM) is working on molecular mechanisms of regulating self-renewal of embryonic stem cells. More scientific integration with other groups of the Glycobiology Unit would improve the scientific outcome of this group.
Taking in account the cumulative achievement of the all groups of the unit, the internationally high standard of research of the Glycobiology Unit of the IMBIM has been recognized during the KoF11 evaluation.

The Glycobiology Unit spent some effort to balance the composition of their staff between senior, junior and student researchers. The recruitment of Dorothe Spillmann and Johan Kreuger is a good example for this successful development. The future recruitment of a new associate professor, sponsored by the “Foundation for Research on Proteoglycans”, will further strengthen the scientific output of the group. It will be of great importance for the unit and for proteoglycan research in general to better support and promote the scientific future of the group of Jin-Ping Li. Taking into account the importance for the field of proteoglycans of the technique to analyze GAGs in small tissue samples from different species, established by the group of Dorothe Spillmann, the option to integrate this technique with SciLifeLab-Uppsala or to provide an additional technical position for the group should be considered.

The Glycobiology Unit is traditionally very well connected internationally. Its unique expertise in HS biosynthesis makes this unit very attractive for other researchers in the field of proteoglycans. In order to intensify local collaborations and adequately use the expertise of the Glycobiology Unit, the integration of ideas and unique techniques of this unit within SciLifeLab-Uppsala is strongly recommended. This could be of great importance for the research of the Genomic and Tumor Biology Units of IMBIM as well as for the Department of Medical Cell Biology. Moreover, it would further expand the scientific interests of the Glycobiology Unit and provide opportunity to generate new positions for young researchers.

It is important that the Glycobiology Unit will recognize the necessity for moving from strict biochemical analysis towards biological and medical applications. Addressing these questions not only in mouse models, but also in zebrafish and C. elegans, as already started by the unit, will improve the quality of research and allow for more collaboration. The panel is concerned that the functional studies have not developed as positively as expected based on the previous review (KoF07) and that cutting-edge technologies have not been implemented in the gene knock-out facility linked to Glycobiology. These concerns have lead the panel to lower the grade given to internationally high standard as compared with the top ranking received at KoF07. The gene knock-out facility would gain from a closer collaboration with the Science for Life project and perhaps also be part of a core facility program.

Closer collaboration with the Genomic and Tumor Biology Units of IMBIM as well as integration within SciLifeLab-Uppsala would further broaden the biological and medical interests of the Glycobiology Unit. The combination of hypothesis-driven research with proteomic approaches, as already planed by the unit, would further improve the quality of the research.
Tumor Biology

The Tumor Biology unit aims at elucidating various processes that are needed for tumor cell development, tissue infiltration and growth in a suitable environment. The new information obtained will be used for exploration of new treatment strategies. The unit is composed of seven principal investigators that each work on his/her focus areas.

The unit appears to enjoy good leadership. While being a good scientist himself, Professor Kristofer Rubin provides freedom, space and encouragement for the researchers to pursue their goals. As in other groups working at IMBIM the financial resources are channeled directly to research groups, which have the freedom to use them in the most optimal way. Resources are allocated according to previous accomplishments, primarily according to publication records. The system appears to be motivating because it considers the quality and number of publications and the relative contributions of the authors in the published papers as well as teaching duties in a research-supportive fashion. The researchers work in an environment, where the basic infrastructure seems to be adequate for the needs.

While working in an extremely competitive research area the Tumor Biology unit researchers have found their own niche areas (areas “in-between”), where it is possible to make relevant original contributions. The research projects appear complementary to each other by focusing on the extracellular matrices of tumors and different cell types (tumor stem cells, tumor cells, endothelial cells, fibroblasts, pericytes and inflammatory cells, e.g., mast cells) some of which have often been neglected as research targets. Researchers at the unit have developed elegant models to study, e.g., tumors in animals, fluid exchange and drug uptake in tumors (Kristofer Rubin), effects of cell detachment and reattachment on the chromosomal content of tumor cells (Staffan Johansson) and so called looping angiogenesis and tumor contraction (Pär Gerwins). These provide platforms for functional studies, e.g., in the search and testing of new drug candidates. These will be helpful in setting up new collaborations. Until now the individual researchers have collaborated fairly extensively with researchers outside. Because of the complementary and synergistic approaches there could be more collaboration between the investigators inside the unit itself.

From the strategic point of view there is space for improvement in the unit and possibilities to expand activities. Although excellent unifying concepts of cellular-stromal interactions in tumors and on finding therapeutic targets were presented, the research as a whole appears somewhat fragmented into medium-sized to small projects and the overall size of the unit may not yet have reached a critical mass. The various models employed necessitate a core crew of technical staff to run and maintain the activities. Also, core facility services (animal experimentation, genetic and proteomic analyses, and immunological services) should be kept or made flexibly available nearby or from the SciLifeLab collaboration. The excellent projects on epithelial-mesenchymal cell transition of
Professor Aristidis Moustakas would get a stronger foothold at IMBIM if his activities could be fully (or at least 80%) transferred to IMBIM from the Ludwig Institute for Cancer Research, where he currently holds a 50% position. This transfer could bring more competent people to the Tumor Biology unit and strengthen research on tumor stem cells and carcinogenesis inhibitors. The latter would be particularly useful since one of the main strategies outlined by the unit is to explore therapeutic targets in tumor stroma and the various cell interactions. Often the prognostic factors of tumor development and responses to therapy are more related to factors in the stroma and stromal cells rather than in the tumor cells themselves.

In addition to increasing the presence of Professor Moustakas further recruitments to the unit could strengthen its missions. Obvious directions for expansion include collaboration with the SciLifeLab and U-CAN initiatives. Observations from high-throughput analyses, when appropriate, could be tested in the various functional models set up in the unit. Furthermore, the wide collections of pathological samples in biobanks could be made available to the unit for fruitful exploitation. If possible, the unit could benefit from increasing collaboration with clinical oncology researchers. Some potential collaborators could be found also with other groups within the IMBIM, like the mast cell researchers Maria Ringvall (Tumor Biology) and Jenny Hallgren (Immunology).

A brave proposal on using vaccination with a distinct tumor vasculature-specific domain (ED-B) of fibronectin was also presented (Anna-Karin Olsson). As a proof-of-concept type approach immunization with (ED-B) reduced tumor growth in a model system. While immunization of humans might appear too risky one could, as an example, consider the development of monoclonal antibodies against this domain. They could be appropriately modified to meet the therapeutic needs. Overall, the projects would benefit if various alternative options would be available in cases where the primary approach does not turn out as a success.

Collectively, the research output of the Tumor Biology unit is outstanding and the unit has produced a number of high quality publications in recent years. The work is focused, original and innovative and explores functional aspects. The unit has also made excellent progress since KoF07. For these reasons, the evaluation group rates the level of research to be of internationally high standard.

**Protein Chemistry**

The activities presented for the panel at Medical Protein Chemistry were those of the following research groups: Drs Per Jemth, Birgitta Tomkinson, Erik Fries, Pia Ek, and Åke Engström.

During the previous evaluation (KoF07) Dr Jemth was presented as a newly recruited young scientist with a main interest in the area of structure–function relationships of proteins. He has continued within this field of research and he is
currently involved in the study of factors governing protein folding and how intrinsically disordered proteins bind to DNA. Other areas of interest are studies of the human papillomavirus proteins E6 and E7 with the ultimate goal of finding new drug targets. Dr Jemth is now head of a group of eight and he has been very successful in his studies as reflected by an impressive publication record in highly ranked journals such as PNAS and JBC. Jemth has also established an impressive network of international collaborators. The panel is particularly pleased to note the emerging collaboration with Drs Andersson and Lindblad-Toh. At times this panel has sensed hesitation to venture into collaborations outside of the immediate boundaries of one’s subject – here Jemth constitutes a refreshing exception. This link to Comparative Genomics is deemed to be of special importance and of strategic weight for the Science for Life project as a whole. The molecular understanding of how genetic aberrations translate into phenotypic changes resides to a large extent on understanding of protein structure–function relationships. Dr Jemth should have a key position in coming years, when functional genetics enter the proteome. The work is of internationally high standard.

Since KoF07, Dr Tomkinson has continued her studies of structure, function and physiological role of the very large enzyme tripeptidyl-peptidase II (TPP II). The focus is on substrate specificity and how oligomerization is regulated. The group consists of a PhD student and a technician. Since 2008 three papers have been published, one of which is in Nature Immunology. The panel is of the opinion that it would be beneficial for the group to have more collaboration especially with those that focus on the functional properties of TPP II. The work is scored as internationally recognized.

Dr Ek studies phosphorylation and its fundamental role in signal transduction in the eukaryotic cell. The main focus is on the role of phosphohistidines. The group has a limited publication record during the last years with only one publication. The work is deemed to be of acceptable quality.

The focus of Dr Fries’ research activities is on the mechanisms of intracellular processing. For this purpose haptoglobin and related proteins have been studied. Dr Fries has published one paper since 2008, and the project is proceeding very slowly. His work is deemed to be of acceptable quality.

Drs Fries and Ek are both approaching the age of retirement and the panel strongly holds the view that their positions should be reinstated within the important field of protein chemistry. This is perhaps something that can be done in close collaboration with the Science for Life initiative since recruitment of skilled protein chemists clearly is of paramount importance for this project.

Dr Engström heads the facility of Expression Proteomics. This laboratory provides state-of-the-art services in 2-D analysis, mass spectrometry, image analysis as well as general protein chemistry. Engström, being a skilled and experienced protein chemist is providing an important service in this field. The panel is of the opinion that this facility is of vital importance for protein chemistry in general as well as for future successful development of the Science for
Life initiative. It might be worth looking into possible synergies between this facility and a similar facility at Glycobiology.

**Molecular Virology**

This unit previously was an Uppsala University flagship entity under the direction of Professors Lennart Philipson and Ulf Pettersson, and research on the molecular biology of adenoviruses remains the core activity. The Virology unit at IMBIM hosts four major research groups who have partially shared focus areas in viral miRNAs, RNA processing, adenoviruses and oncolytic adenoviral therapy. The research areas are internationally very competitive and the research groups have done good basic research in the field. The department is going through a transition period with some major personnel changes. Professor Stefan Schwartz (molecular virology) has moved to Lund University, and the professor of virology (and former chairman) Göran Magnusson is retiring in the autumn of 2011. These changes leave the unit – so far – devoid of researchers with medical background. A new professor in virology is now under recruitment, and the unit has expressed a desire to have a person with medical background to broaden the scopes of the virology unit. Naturally, this can be fully endorsed, although the recent arrival of Dr Öberg partly meets the problem. Such a recruitment could increase the medical impact of the research, as has been the case before, and possibly also provide more dynamics into interactions within and outside the unit.

The current lead projects are focused on viral and other interfering RNA molecules. They aim at finding out, e.g., functions of viral miRNAs and whether host RNAi could protect us from viral replication and infections, or whether viruses could exploit RNAi for their own benefit. The small inhibitory RNAs are an extremely exciting, and increasingly popular, research topic. Therefore, staying at the cutting edge is very challenging, but could be rewarding if the work leads to novel observations. In the unit special emphasis is on adenoviruses in this regard. Professor Göran Akusjärvi’s group is studying the adenoviral major late transcription unit as a model gene and an intriguing nuclear phosphoprotein L4-33K, which is a key protein regulating RNA splicing. An exciting recent development in this competitive field is the control by virus-encoded micro-RNA. These tiny regulatory elements, which are only 6–7 nucleotides long, can at present not be investigated by the techniques of bioinformatics, due to the abundance of false positives. Instead, a direct biochemical approach is being used to deduce physiological regulatory roles of these micro-RNAs. This seems an ambitious project well suited to the expertise of this group. In related studies, two specific viral proteins involved in reprogramming of splicing are characterized, and the abundant adenovirus-encoded VA-RNAs are investigated with regard to their ability to block the cellular interferon response after virus infection.
A recently re-recruited young researcher, Tanel Punga, focuses on adenoviral small RNA-dependent gene silencing, and also on induced changes of cellular chromatin structure dependent on small non-coding RNA. This work was well presented and gave a dynamic impression of ongoing work with a trend forward. Promising and clearly defined projects were presented. The panel also heard a presentation from Dr Daniel Öberg, who returned to the unit in late 2010 after a successful postdoctoral period with the eminent Dr Ian Hart at St. Bartholomew’s hospital, London, U.K. Professor Hart, who has just retired, is an expert on gene therapy with oncolytic adenoviruses, and Öberg now attempts to apply this medically oriented approach in Uppsala. Tumor- and replication-selective adenoviruses are considered as one of the most promising new ways of cancer therapy. Success, however, is hampered by lack of efficiency and/or potential risks of the therapy (like liver toxicity). Therefore, further development of the vectors and means of therapy are required. Dr Öberg generates new types of viruses with better targeting properties by genetic modifications. This is largely applied research, although some basic approaches (studies on viral E1B protein) are also pursued.

Lecturer Catharina Svensson presented a relatively small project on adenovirus-induced changes in host cell gene expression. Clearly, her more important contribution was a presentation on a Master program in infection biology. As noted elsewhere in this report, this is an excellent achievement.

The publication record of Professor Göran Akusjärvi does not quite reflect the level of work actually carried out. Thus, perhaps the level of ambition should be set a little higher. As an individual research entity the panel considered this project as internationally recognized standard. The dynamic performance and project of Dr Tanel Punga was scored as internationally high standard. The panel considered Dr Tanel Punga as a successful acquisition to the unit, where he had started his career. Dr Daniel Öberg is doing solid work, but, apart from a first-authorship paper in Clin. Cancer Res. in 2010 not many other publications have appeared yet. Therefore, the panel scores his research as internationally recognized. Since research by Dr Catharina Svensson has not been very productive in recent years, with only one major publication in 2009 (in Virology), it received a score of being acceptable.

As a whole the research plans of the virology unit, as presented, appeared exciting and well formulated on specific topics. Overall, however, and especially if compared with respective international laboratories, the unit has not until now been very productive. It gives a somewhat uneven, and scattered impression of the research. For these reasons, the overall score given to the unit was internationally recognized. The main topics are important and competitive, no doubt, but somehow the results are not yet reflected as a very impressive outcome. There are good basic questions that are being addressed. Thus, answers to them, explored by elegant experimentation, should potentially lead also to good results. It appears that the field is internationally very competitive. Also, the methods are fairly sophisticated. Since the number of investigators in the
Part III: Panel Reports

Panel 20

Bacteriology

In bacteriology the research efforts at IMBIM are very synergistic and focused on problems in antibiotic resistance and evolution under selective pressures. Research is carried out in four different research groups, three of which work on bacteria and one on malaria parasites. One of the positions (assistant professorship, Linus Sandegren) was created on the basis of a favorable evaluation in KoF07.

The quality of research on antibiotic resistance and evolutionary adaptation of bacteria is really of world class. It provides a platform for analyzing one of the most important biomedical problems – increasing resistance to antimicrobial therapy – as well as observing compensatory microbial evolution “on-line”. Different selection pressures and a full spectrum of analytical methods are being employed. The research work covers many important human pathogens ranging from Gram-negative (like Salmonella and E. coli) to Gram-positive (S. aureus, enterococci) bacteria. While most of the work is done in vitro, animal experiments and clinical studies are also being performed. The truly academic nature of the work (formulation of approaches, logical hypotheses, theories and reaching conclusions) became apparent during the presentations. The questions asked were very relevant, and clearly presented.

The publication record of the leading scientist, Dan Andersson, is healthy and really of top level with recent papers in PNAS, Science and Mol Microbiol. Progress since 2007 has been remarkable. Professor Diarmaid Hughes recently joined the unit (move from the Department of Cell and Molecular Biology, Faculty of Science and Technology, in the same building). Dr Hughes is a world-leading scientist with a scientific production of top quality. This has strengthened the unit even more by providing complementarity and a broader basis for studies in bacterial genetics, antibiotic resistance and fitness. Fruitful collaboration with Professor Andersson seems to have been ongoing already for a long time.
time. Professor Hughes has also published in the best journals of microbiology and antibiotics research. The recruitment of Linus Sandegren in 2009 provided a start for the emergence of a new generation and strengthened research on resistance to beta-lactam antibiotics. These studies are very practical and important, not least because of the emergence of widely resistant bacteria (ESBL and carbapenemase-producing bacteria). The publication record of Dr Sandegren is still relatively thin but the work seems to have an upward trend.

The top researchers in bacteriology are well funded, having swept away almost all possible funding from public sources. Importantly, the researchers appear to have maintained independency from the industry, which has strong interests in the topic, as well. The possibility to allow free and independent research in the field seems excellent, and this situation should be maintained also in the future. Training of more young researchers into the field should remain as one of the key aims. The risk of remaining too “theoretical” could perhaps be avoided by increasing contacts with diagnostic bacteriology laboratories and with colleagues working on infectious diseases. Because of the high relevance of the work for public health (e.g., for environmental contamination with antibiotics) appropriate education of the medical professionals and perhaps also the general public should be kept in mind. Nevertheless, fundamental research in basic mechanisms of microbial adaptation is and should remain as the main focus.

The evaluation panel is happy to rate the research work of both Professor D. Andersson and Professor Hughes as top-quality. Because of the successful adaptation of Dr Sandegren into the unit, good level research and enthusiasm for the subject he was given a score of internationally high standard. The weight of the research done by the two major groups, aided by a promising emergence of the younger generation give the unit an overall score of top-quality.

Dr Göte Swedberg is collaborating with the Karolinska Institutet on malaria and the antimalarial drug resistance problems. He is active in training medical students in the tropics (Africa) providing thereby a great opportunity for motivated students to get first hand experience on conditions in the developing countries. However, in the hard world of competitive research the work has not reached a high level and has, unfortunately, been in relative stagnation since the last KoF07 evaluation. Only few publications, mainly on mutations in folate biosynthesis pathway components related to antimalarial drug resistance in malaria parasites have appeared. These do not provide any novel breakthrough concepts, but more or less repeat what has been observed earlier. Therefore, the panel has assessed the work as acceptable.

It has to be noted that the area of research (malaria), in the global perspective, is extremely important and merits support. As a whole, parasitology research is relatively underrepresented at Uppsala University. Collaboration on research in malaria with the Karolinska Institutet should be continued. In other areas of parasitology (like helminthology) there could be joint interests with the Swedish University of Agricultural Sciences.
Immunology

Immunological studies at IMBIM are focused on the effects and functions of antibodies and mast cells in immune defense against microbes and in the development of immune responses. The studies employ traditional in vitro molecular and cellular analyses, as well as animal experimentation using genetically modified mouse strains and in vivo imaging.

The immunology unit of IMBIM is comprised of three groups, one headed by an established and experienced researcher, professor Birgitta Heyman, and two more junior groups led by Jenny Hallgren and Frida Henningson. The latter two have both started since the KoF07-evaluation (one in consequence of the evaluation). On the basis of the KoF07-evaluation, the three immunology groups were moved under the “same roof”. Future plans include the move of one group back to SLU, the Swedish University of Agricultural Sciences. Compared to, e.g., bacteriology the immunology unit appears relatively small and its funding level is commensurately lower.

Birgitta Heyman is working on antibody feedback regulation and the roles of, e.g., IgE, CD23, immune complexes and complement in the regulation of immune responses. This work is interesting and important, involving in vivo imaging of antigen and antibody traffic. Although the work appears somewhat restricted in its scope it follows a clear line and has produced a good number of publications (although less so during recent years). Jenny Hallgren studies mast cells and asthma. She did her postdoc at Harvard University with a very good outcome studying, e.g., mast cell progenitors. In her recent last-author PLOS One paper she, in collaboration with Birgitta Heyman, observed that IgE immune complexes stimulate lung mast cell progenitors in a mouse model of airway allergy. The approaches appear fresh and novel. Frida Henningson primarily focuses on novel roles of CD23, currently known as the low affinity IgE receptor. Part of the work is related to IgE-mediated immune enhancement and another, particularly novel, to roles of CD23 in innate immunity.

Despite the merging of immunology groups together, the current immunology activities at IMBIM still appear insular. This is perhaps due to focusing on subjects of the researchers’ own interest. The main collaboration of Professor Birgitta Heyman is with her former mentor Michael Carroll at Harvard University. The immunology activities need strengthening, and the possible outwards move of one group needs to be compensated for by the acquisition of another immunology group to IMBIM or by a creative expansion of the existing groups. Immunology is a central activity in many disciplines because immunological approaches and techniques are being used in many other research areas. In principle, support for this kind of activities should be provided by the immunology community. Also, immunology is used a lot in diagnostics. Perhaps the activities of the unit could be expanded somewhat in these directions, particularly to clinical immunology. The current activities focus perhaps too much on small issues while there are still many big questions without an answer. The bot-
tom-line, however, is that continuity in studies on basic immunology should be maintained.

The unit would need one or two more postdoctoral researchers, and some more PhD candidates, as well. While this is a goal, also longer-term positions for the existing young researchers would be desirable to allow continuity and “faith in the future”. The young researchers working on mast cells could find potential collaborators since mast cell work is carried out in some major groups outside Uppsala University and also within IMBIM (at the Tumor Biology unit). Lack of technical support seems to be a common problem in the unit.

Because of the apparent isolation and relatively slow pace of publishing, the immunology unit as a whole was given a score of internationally recognized. It has to be noted, however, that the number of people and the resources are relatively small, therefore the unit gives a fragile impression. Yet, the researchers are enthusiastic and have found their own niches in the vast field of immunology. The group dynamics seems to work well, and there appears to be great future potential. Dr Jenny Hallgren, who has had a little longer time (since 2007) to adapt herself to the unit and has obtained recently a good publication record, was graded as internationally high standard.

Strategic considerations

A new MD-PhD, DVM-PhD programme

A general need in the preclinical field is to encourage more MD’s to follow a PhD programme at an early stage in their career, that is before they enter specialty training. This would facilitate translational research between the preclinical field at Uppsala University and the Uppsala University Hospital. The initiation of an MD-PhD programme in Uppsala is therefore most welcome. On the other hand, the most outstanding research performed at IMBIM (and many other departments) involves or would benefit from involvement of domesticated animals other than rodents. In particular, this relates to the outstanding functional genomics work of Leif Andersson, Kerstin Lindblad-Toh and co-workers, the exciting tumor biology work of Anna-Karin Olsson, Pär Gerwins and co-workers, and the superb work on antibiotic resistance by Dan Andersson, Diarmaid Hughes and co-workers. But this is not an exhaustive inventory. One frequently perceived problem by these scientists is the absence of doctors in veterinary medicine (DVM’s) who wish to engage in basic research, let alone molecular biology. This is an acute problem because complex functional genomics requires high quality phenotyping involving all modern diagnostic tools, experimental oncology requiring cutting-edge imaging, bacterial adaptation to antibiotics in farm animals poses an immediate threat to public health, and so on.
A comprehensive solution to both needs can be envisaged in a combined MD-PhD and DVM-PhD programme supported by Uppsala University and the Swedish University of Agricultural Sciences (SLU). This programme would be attractive for MD’s and DVM’s who have a keen interest in basic science and in large animals, and have completed their basic training but not yet entered specialty training. Participation in this programme would exempt them from other obligatory science courses falling under Bologna Bachelor/Master requirements of “scientific research”, and could therefore shorten their curriculum by several months. Candidates accepted for this MD/DVM-PhD would complete their PhD programmes within a maximum of four years at the strongest preclinical groups at Uppsala University and SLU, before entering their specialty training. Such an intensive programme is perceived by panel members as being more valuable for the scientific community and for those MD’s and DVM’s who wish to pursue a scientific career than extensive periods required to complete a PhD when these MD’s and DVM’s are further in their academic careers or have even completed their specialty training. Ideally this programme would foster the most talented MD’s and DVM’s as independent clinician scientists in translational research.

In order to make this MD/DVM-PhD programme efficient a joint initiative of Uppsala University and SLU should also facilitate the introduction of high-level training in molecular biology for this dedicated group of young MD’s and DVM’s. Fortuitously, a Master programme in Infection Biology, developed by Catharina Svensson of the Virology unit at IMBIM, has been running for two years. Ideally, this Master programme could co-ordinate training in molecular biology for all participants in the MD/DVM-PhD programme and also be extended to a PhD programme in Infection Biology that would be of interest to either MD’s or DVM’s interested in an academic career or specialty training in microbiology.
Panel 21

Scope of the panel’s evaluation:
Department of Public Health and Caring Sciences
[Geriatrics evaluated by the Neuroscience panel, see pages 503 and 528.]

Department of Public Health and Caring Sciences

General assessment of the department
Panel 21 evaluated the Department of Public Health and Caring Sciences except for its group investigating geriatrics. The panel visited 10 groups and spoke to the department’s (future) head and deputy head. We have met a large number of highly motivated persons willing to contribute to science as well as society. Since the KoF07 evaluation, the department has made significant progress. It appointed a new Chair in preventive medicine, as well as three lecturers with clinical positions. A systematic quality assessment of the PhD program and a compulsory course for PhD students is now in place. An IT as well as a media policy has been arranged. A two year MSc of Public Health Program is introduced. The level of funding, the number and quality of publications, attracting PhD students to each research group and instituting seminar series for students and faculty are improvements since 2007. Also, an annual reporting process is established. The department has attractive space and adequate equipment for researchers. The department also seems to have a better working relationship with the County Council which improves the department’s research efforts.

The department covers a wide range of subjects, from clinical nutrition to disability research and from ethics to oxidative stress. The research focus could probably be summarized as public health and behavioral sciences. This area of investigation is of great societal relevance. Yet, the department does not have a clear overarching focus to drive its efforts and distinguish it from other groups at Uppsala University and elsewhere. It is therefore particularly difficult to judge its overall quality. As on our previous visit, the panel encountered a lack of conceptual clarity as well as limited strategic vision. One might actually say that in itself the lack of such overall vision is a weak point. Similarly, a number of the groups have no clear vision of their main focus nor of the central research questions they address. Theoretical underpinning of the research is often lacking. The panel met many groups of different quality and of different focus. These seem to operate rather independently and to some extent uninformed about other groups’ current research while themes are often overlapping. Moreover, some of these groups are vulnerable. They are sometimes small. Therefore the level of exchange and consistency needed to build a strong research line may
be lacking. It also hampers the continuity that is necessary to build a strong research program. Partly, this may be due to the fact that seniors have to find funding for (part of) their own position.

Quality of research
Given the large differences within the department the overall quality of the department is difficult to establish but has improved since 2007. A number of groups are of top-quality or of high international standard. Others are of international recognition, acceptable or even insufficient. As previously mentioned, the overall vision, strategic planning and synergy within the department is unclear. The output is large though often not of high impact. Funding has improved. We therefore consider the department as a whole of international recognized standard.

Research environment and infrastructure
Even though we have seen improvement since KoF07, there is still quite some room for improvement if the overall ambition within the department is to perform research of international high standard. A good infrastructure is needed for the whole department. A new department chair is appointed who will take over in the next few months. As we see it, the department is currently too scattered and in need of an overall vision and strategy. A common support core seems to be missing. Many of the groups visited expressed a wish to see more statistical, health economic and grant writing support. The combination of teaching and research imposes a high level of burden on some of the senior persons. This should be discussed. There is considerable clinical collaboration within different groups even though this might be strengthened further in some areas.

Networks and collaborations
It is obvious that PhD students, postdocs, and senior researchers have improved international collaborations as compared to four years ago. At the same time, relatively few junior or senior researchers have been abroad for some time and relatively few foreign researchers are working within the department. Within the department efforts have been made to collaborate more clearly: PhD projects are supervised together and seminars are held that are appreciated. At the same time, collaboration can and should be strengthened to develop the quality of research and let individual research lines grow into programs.

Opportunities for renewal and emerging science
The panel sees some possibilities for further renewal of science. A systematic investigation of the availability of major Swedish datasets could be fruitful: “what is available, what could be used with what methods and for what questions?” could be established. The department should better take advantage of the national initiatives to strengthen clinical research that utilize national datasets. Several new initiatives support this. The newer area of epigenetics has been
mentioned by several groups. The knowledge to undertake such complicated endeavor is not available but good cooperation with groups in Uppsala and elsewhere might be useful in this respect.

One would like to see a more stable relationship with the County Council. Longer lasting agreements, with Uppsala University being held accountable for outcomes seems to have potential for continuity and further growth. Negotiations with the local County Council could focus more on medium range planning and contractual agreements that would encourage strategic planning, and shared goals and objectives.

**Actions for successful development**

A number of changes could be made to improve the productivity and quality control of the department.

- To promote quality, investment in the departmental infrastructure is needed. This would entail establishing a ‘methodological core’. This would include experts in study design, statistics and data analysis, qualitative methods, health economics and writing grant applications. An internal review process and peer feedback is needed for all grant proposals before they are submitted externally for review. Access to a university liaison officer at the university level knowledgeable with the Swedish Research Council, Foundations and the EU funding agencies and budget requirements of granting agencies and foundations would also be useful in helping shape grant proposals to fit the priorities and processes of the granting bodies. Workshops could be given to the entire department to familiarize faculty, staff and students with the major Swedish data sets, useful study designs, theoretical background to inform the studies, contemporary data analytic techniques and interesting interdisciplinary research paths.

- To promote the research quality and recognition, international collaboration and exchange could be stimulated. One might invite internationally renowned experts to give seminars or master classes. One might also develop granting possibilities for international longer term leaves for PhD students and more senior researchers.

- The panel suggests that synergy in the department needs to be nourished for two reasons. First, the groups are currently small and therefore vulnerable. They sometimes depend on one person only. Such lines of research may have to be terminated when that one person would no longer work in the area. Thus, no continuity can be built. Their consistence seems historically rather than content driven. Secondly, synergy is needed to stimulate working on common research questions, theoretical approaches and methods. Thus, the more in depth approach needed for high quality research can be reached. The research groups in the department vary in size (3 to 42). Different investigations suggest that for creative and synergistic research a critical mass from 10 to about 30 members in size in groups is needed. We suggest that there be a re-organization of the existing groups. Common
themes should be identified. We see two clusters of groups and/or research subjects. On the one hand, studies focus on ‘public health and preventive medicine’ (e.g., in preventive and family medicine, social medicine, clinical nutrition, health services research) and on the other hand studies are related to ‘health care research’ (e.g., in caring sciences, psychosocial oncology, health services research, bioethics, disability). Within those, questions about theories/models and overarching research questions can be formulated. Both clusters would have to be coordinated. These clusters would find a common denominator and more clearly work together on shared research problems, theories and methods. It is then to be considered whether appointing a research director is helpful for further establishing quality and collaboration within the department. The upcoming vacancies within the department may actually create the possibility to reconsider some of its structure.

- Part of this exercise might be to rethink the labeling of the different fields with overlap and unclarity of names (e.g., caring sciences, family ethics). This might further help to gain with more synergy.
- For such enterprise to be effective, the leadership model may involve developing management skills for leading executives and organizing responsibility in such manner that change can be assured. It is suggested that an external advisor can accompany this process over the next years.
- Leadership roles have to be reconsidered for those persons who are away from the office most of the time.
- A mechanism can be developed by which excellent research is awarded and stimulated. A better incentive system can be developed, e.g., by adding one PhD if a group attracts a major grant.
- Finally, for some senior persons the teaching load is too heavy to enable them to do good research. This should be considered. It may result in different ways in which areas are taught but also in the way these persons are being paid for their research endeavor. This could also entail that teaching is divided among the staff in a more flexible way, e.g., by asking less teaching from some faculty.

Caring Sciences

General assessment of the unit
The Caring Sciences group presents a broad range of research areas. It has formulated the following four themes covering their research activities: a) health and care among children, adolescents and young adults, b) health and care among elderly, c) psychosocial genetics and cancer care, and d) quality of care and patient safety.

To develop and deepen each of these into competitive and strong research fields is a challenging mission. Time and resources will be needed to deepen and
develop the areas that would optimally be chosen from among this portfolio of projects as being the most competitive in the field. This requires strong and focused leadership. The group has difficulty formulating their profile as distinguished from others. The group is seen by the panel as very enthusiastic and motivated though.

Following KoF07, the group has seen an increased number of senior staff, full integration of teaching and research, increased collaboration within the department, nationally and internationally and increased scientific output. The faculty board appointed a new chair in caring sciences combined with clinical position as nurse. The new positions as senior lecturers are also combined with clinical work. Several of the researchers are members in distinguished international societies; the group thereby seems to be internationally acknowledged within their respective fields.

**Quality of research**

Strength of this group is that the research focus is clinically relevant and that research questions are picked up in clinical practice. This is made possible by the fact that a majority of the researchers have combined services between clinics and academy. The group uses longitudinal and controlled designs. The area of genetic counseling has attracted funding from the Swedish research council and several other resources but overall the section has difficulties getting their research being funded to the extent that is needed. Several of the faculty are internationally recognized (e.g., invited speakers to international conferences) and show considerable production in terms of publications (173 peer reviewed articles since 2008) although high impact journals are not well represented. The quality of research is therefore considered to be of an international recognized level.

**Research environment and infrastructure**

The combined positions with clinics and academics make clinical research opportunities feasible although the majority of the lecturers have too little (20% or less) of their time to do research. Research lines are strongly connected to individual persons. In order to have more breadth within these research lines would mean that more people should be included.

A problem within the group is that all the researchers have extensive teaching commitments, some only have one day a week for research which makes it very difficult to develop the strength in research that at this point is needed.

The dominant research areas represented by the senior researchers are vulnerable. The research issues are too much connected to one senior person only. Tradition seems to be the reason why the group addresses these topics rather than an active strategy pursued.

**Networks and collaborations**

There are three joint positions with Universities of California San Francisco
Opportunities for research collaboration within the department are not being used sufficiently while international collaboration between Norway and the U.S. has been developed and is quite productive in terms of publications and attracting doctoral students. The emphasis on clinical research is strength but needs to be connected to other strong research groups. This could enable attracting more research funding.

Opportunities for renewal and emerging science
A weakness is that little conceptual framework is formulated and the themes are broad. The increasing number of students being interested in participating in research is an underused source, probably due to the lack of financing. The section has increased the number of PhD students but would benefit with some postdoc positions.

Actions for successful development
The panel sees some possibilities for further improvement:

- The four themes covered are too broad to make the rest of the department and the university as a whole aware of the potential in the section in terms of for example methodological skills and expertise in various clinical fields. The group should consider what distinguishes them from others and formulate the core research questions they would want to address.
- The groups’ members’ heavy load of teaching leaves little time not only to do research but also apply for research funding. This should be reconsidered.
- A need of statistical support and health economic expertise was expressed by the group and would certainly be useful.
- Further increase of collaboration within the department can strengthen the group (e.g., stress research with social medicine and psychosocial oncology with that unit). Likewise, collaboration with other groups and with the hospital and Uppsala municipality would strengthen the group. It might enhance the group’s size and thus make it less vulnerable.
- The fact that 4 senior researchers in the section will be retired within 5 years should be considered. This may provide an opportunity to think through and further enhance the focus of the group.

Clinical Nutrition and Metabolism

General assessment of the unit
This group produces solid research primarily focusing on metabolic and dietary interaction in health and disease. It addresses fatty acid metabolism and intervention studies but several other areas of research are investigated. The research projects span from observation to experimental to clinical and intervention. The study design of the projects is very good and the competence within the group is high and complementary.
The atmosphere within groups seems good and creative. The researchers show a clear vision about the future, high ambitions and a strong self-confidence. The funding is good. It is noteworthy that the group not only strives for delivering important scientific work but also for contributing to society, e.g., by implementing their research results and by guideline development.

Quality of research
In general the projects are of international top-quality with elements that must be considered as world-leading. Other projects should rather be classified as internationally recognized. The group members represent high competence in many areas that are relevant to clinical nutrition and metabolism. In the period 2008–2011 the unit has published 144 peer reviewed papers, several of these in first rate quality journals with the highest impact. Among them 92 with impact factors 3–10 and 6 with impact higher than 10, e.g., the New England Journal of Medicine and The Lancet.

Research environment and infrastructure
The research environment is creative and stimulating with experts in many different fields. There is a close cooperation with geriatrics which is also linked to public health and with groups in medical sciences. There are two labs: one on fatty acids and one on body composition assessment. The group has connections with other research groups, clinical departments and different Swedish authorities such as the National Food Administration. The whole group seems to be very motivated with a large freedom to do multidisciplinary research from different perspectives. The leadership is inspiring, promoting competitiveness in a good way. The group does not wish to grow much further.

Networks and collaborations
The group has a large network of collaboration ranging from groups within the department, other groups in Uppsala University to the Uppsala County Council and several excellent international laboratories. It is therefore surprising not to find any international PhD students or postdocs in the group.

Opportunities for renewal and emerging science
The most obvious area of renewal appears to be combining nutrition and physical exercise. Another line of research should include connection between nutrition and social, behavioral sciences. An area which has been entered but where no concrete project has yet been formulated is child obesity. In this area the group is not the leading investigator but rather cooperating. EU funding has been obtained. Other possible areas of renewal are fatty acids’ effect on cognition and gene expression and insulin resistance/sensitivity, fatty acids and epigenetics and immigrant women and nutrition status. The group can further intensify its industrial collaborations.
**Actions for successful development**

Some recommendations are:

- To preserve scientific independence, i.e., safeguard scientific independence in ownership of data and publishing when collaborating with industry;
- To increase the number of foreign PhD students and postdocs; money should be reserved for this purpose;
- To optimize the environment by a) maintaining good access to research expertise, b) receiving support for doing grant applications, c) receiving further statistical support from the department at large, d) find collaboration for epigenetic analysis and expertise (for example in exchange / collaboration with the social medicine group).

**Disability and Habilitation**

**General assessment of the unit**

This group addresses the everyday experiences and difficulties of people with disabilities. The research efforts are concentrated around the general theme of integrating disabled people into society, focusing on the subjective, experiential aspects of disability. While it is conceptually focused, the research strategy is not yet clearly articulated. It has made significant progress since the KoF07 site visit. Considerable attention was given to organizing and enlarging the research group, furthering collaboration, improving management processes to coordinate teaching, research and community service activities. The research has employed qualitative and quantitative methods. Small sample sizes were often included. The group also responded to previous feedback in the KoF07 evaluation by attracting PhD students and began reaching outside Uppsala University to other Swedish universities and by establishing contacts in Sri Lanka and China.

While the efforts made in the last years are commendable, there is question whether the group can survive by itself in a competitive environment given its small size, limitations in funding and commitments of the head to spending 50% of her time in a clinical setting. For these reasons, it might make sense to fold this group into a larger section within the department.

**Quality of research**

The amount of research and the number of refereed journal articles has improved since KoF07. The overall quality of research is judged to be acceptable because a) the research is not clearly driven by one or two focused research questions, b) there is little funding to provide a continuity to the research effort and c) much of the work is characterized by small samples and preliminary studies.

**Research environment and infrastructure**

While the group is small and located on different sites, some cohesion is pro-
vided by research seminars, research meetings held once a month and informal lunch meetings as well as by a brainstorming day convened once a year. At the moment, there are only bits and pieces of funding with no large grants in place. Collaboration seems to be on an individual and ad hoc basis rather than systematic. There seem to be too few people and resources to constitute a critical mass. About half of the research is done by faculty members, the other half by students.

**Networks and collaborations**

There are some conjoint tutoring efforts with PhD students and a few international collaborations, for instance, with China and Sri Lanka. These bring in funds. They are organized on a project level rather than to further intellectual exchange. Involving more international research collaboration would be needed.

**Opportunities for renewal and emerging science**

There is a need to give more attention to the major, overarching research questions that drive the group’s work. These could include but are not necessarily limited to a) integrating disabled people into the larger society, b) breaking down social barriers to the full participation of disabled people in society, and c) improving the quality of life of disabled people. Also, disabled people could still be more actively involved in the research design – we are aware that has already been initiated by the group itself (participatory action research) – highlighting evidence-based needs in Swedish society, and using potentially large existing Swedish data sets.

**Actions for successful development**

Further strengthening of the research endeavor should include:

- postdoc exchanges and establishing national collaboration with other research groups;
- joint PhD tutoring and joint grant applications within the department;
- increasing the number of intervention studies to create evidence-based practice;
- collaborating with other groups nationally or internationally;
- becoming active in the European Disability Forum and attend international disability conferences like the Society for Disability Studies in the U.S. and seminars at Leeds University in the U.K.;
- securing consistent grant funding;
- encouraging students and researchers in the group to focus on a few, interrelated questions.
Ethics

General assessment of the unit
The Uppsala Centre for Research Ethics and Bioethics addresses the application of ethics to a variety of clinical and preclinical questions that deserve in depth reflection. The group makes the impression of being well led and organized, and enjoying their work. The panel sees progress with regard to international collaboration and cooperation as was pointed out in the KoF07 evaluation. The major visible effect of the KoF07-evaluation was the merger with the Center for Research Ethics at the Department of Theology. The unit has grown quite a bit since this last evaluation. Collaborations as delineated above have been initiated. This was partly financed through the small amount of money that the group had gotten on the basis of a high score in the KoF07-evaluation. The group has a clear strategy for the next five years.

The group works on areas such as neuroethics, animal ethics, nursing ethics, family ethics and on particular fields and questions such as biobanking. This area of research in which the group has been strong over the last 10 years will be continued. Building up on this research, the way of collaboration with other institutions has reached a new level as the group is approaching questions of international use of data in registers, for instance, from ethical as well as legal perspectives which will be started as a new research line in the fall. However, there were also some less integrated ends such as questions of relativism and absolutism and fairness and enhancement in doping.

The panel felt given the strength of the group it lacked a common denominator. The outlook upon ethics seems to be rather reactive: the group would pick up problems that come up, e.g., in the clinical arena and reflect upon them. The group’s efforts could be developed into larger, focused research themes.

Quality of research
The unit publishes not only in medical ethical journals, but in medical journals as they want to reach a broader readership. Also, they develop their ideas in monographs and lengthier book articles. The publications of the group range among the top-quality in the field. Several members of the group have been on national and international committees and societies. The panel considers the group to be of top-quality.

Research environment and infrastructure
The ethics group has funding for the work done and is confident that this can be continued given the priorities in different funding bodies. However, the group has to use some funding through the teaching positions they hold. The head of the unit is paid in part by the County Council. The funding could be improved in order to safeguard a stable environment for research. The visibility of the centre can be enhanced. This is already advanced through a webpage and an electronic newsletter with 3,000 subscribers.
Networks and collaborations
The group has a strong network with Karolinska Institutet in Sweden as well as with other universities and institutions in Europe, Asia and Argentina. Among there are several outstanding institutions such as the Institut Pasteur in Paris. There are several joint supervisions of PhD students with other departments and other universities. International conferences, e.g., on medical ethics and its relevance to patients, have been organized and are planned on current issues, such as public private partnership in research. The unit still complains that it is hard to attract PhDs and postdocs from abroad, yet the first are coming in.

Opportunities for renewal and emerging science
The group should conceptualize a common denominator. Also the group might want to be more active with starting topics and confront clinicians with topics rather than await the clinicians to approach them.

Actions for successful development
- The rise in administrative costs was seen as a major obstacle for successful development as this increases the need to get long-term funding for researchers without teaching positions.
- The group thinks that the optimal size of the group would be about 30 in people in total. That would include one more senior person and help with sharing the supervision of PhD students.
- The group may further discuss their labeling as to enhance its recognizability and visibility.

Family Medicine and Clinical Epidemiology

General assessment of the unit
The large family medicine group addresses five main research areas: 1) social insurance medicine, 2) musculo-skeletal disorders, 3) asthma, allergy and COPD, 4) drug utilization, and 5) cardiovascular disease and diabetes. Since KoF07, the research groups are consolidated and the organization is improved. New leadership is under consideration. Compared with KoF07 there is also a clearer research strategy. The relationship with the County Council has markedly improved. The explanation for this is apparently related to new and more research minded County partner (which will change every 18 months). The research topics are relevant for family medicine. Recruitment of general practitioners has been acceptable with funding for PhD students, postdocs and with earmarked research times. Recruitment is characterized by appointment of older GPs. A broadening network of academically interested GPs has been created. Funding of PhD students, postdocs with earmarked research time by the community/County Council has been apparently successful.

The social insurance research is well structured with specific research ques-
tions. Changes in political and legislative rules are not particularly addressed. A rather large research group is involved in the study of musculoskeletal disorders. The questions could be called conventional with some (e.g., the tennis elbow) taking a more daring character. The asthma, allergy, COPD and drug utilization research are of ‘safe’ conventional design. The strength of the cardiovascular disease and diabetes research is that it is based on large data bases. The epidemiological design and statistical work up is conventional and solid.

Quality of research
There is a good publication record: 172 articles have been published since 2008, of which 24 publications have an impact factor above 6.6. The overall quality is diverse. Studies are not innovative in general. The group’s research is therefore considered to be of internationally recognized standard.

Research environment and infrastructure
In 2010 the Family Medicine group constituted of 13 PhD students and 12 postdocs and 21 more senior positions. It is therefore considered a relatively large group. The unit offers a research environment with specialists from different medical fields. The professor emeritus, now the expert in research methods, is stepping down from office shortly and a new leading person is appointed. As in the future the unit will be essentially dependent on epidemiological and statistical know how, the result of the process of a change in leadership cannot be evaluated at this point. The working atmosphere seems good. The size of the five subgroups could be bigger. A multidisciplinary approach within studies is limited. The group leader believes that the present department localization is the best choice. The group’s seminars are important to provide feedback to the researchers and support cohesion within the group.

Networks and collaborations
The improvement in co-operation with healthcare centers is acknowledged. The collaboration within the department is unclear to the panel. The national and international collaborative networks are improving but still limited.

Opportunities for renewal and emerging science
There are good opportunities for further promotion of clinical person centered research and translation of research results into clinical practice. So far there are no plans or efforts to involve research questions on population genetics.

Actions for successful development
There is a need:
• to develop external collaborations both nationally and internationally. A closer connection to for instance department of pharmacology and other departments, e.g., those involved in preclinical research, could result in interest of younger students to join the research group;
• to respond to changes in primary health care in the Swedish society;
• to organize both long term and short term visits by foreign experts;
• to develop a program on how to use the experience and expertise of retired research workers and teachers;
• to attract research workers of younger age to join the group. One possibility could be to include even shorter research periods for physicians at the department in their early years of clinical specialization in family medicine;
• to ensure the availability of statistical and methodological expertise;
• to engage in risk taking and creative endeavors to push the envelope of traditional research efforts.

Health Services Research

General assessment of the unit
Health services research is one of the smaller units in the department. The group is much characterized by the integration of political sciences and caring sciences. It focuses on questions of health care delivery at the macro-, the meso- as well as the micro-level. It’s main focus is on the meso-level though. The group is unique at Uppsala University for looking at health care from a system level perspective. The major themes are governance with a focus on the effects of privatization and recentralization in Sweden, intra-organizational quality control and patient-provider relationships. With regard to the micro-level, the group focuses on patient choice and communication as well as gender competence in telecare. The earlier focus was mainly on qualitative methods. While these are still used, quantitative approaches are also taken up in current research projects.

Since the group was only established in 2006, this is the “real” first-time evaluation. Overall, the rather young team gives the impression of being very ambitious, enthusiastic and open for new ideas and advice. The group has obviously formed a team around the two senior staff positions. We can see that the unit has taken the advice given in the KoF07 evaluation seriously and acknowledge a tremendous step towards improvement. The unit has only taken up PhD students in the three main areas they focus on. The publication rate has doubled. Articles were published in journals with a higher impact factor. Joint supervision of PhD students with other groups and departments has been established.

Quality of research
The quality of research can be assessed as internationally recognized in some parts, in others as acceptable. This means that progress is seen since 2007. Yet, the group may consider focusing their research more clearly.

Research environment and infrastructure
The group seems to lack stability as there is no tenure track or full professorship
heading the group. Especially in order to go for larger and more longitudinal research projects, the group needs a more stable and protective environment. This could be warranted by establishing a tenured professorship and some teaching positions.

The group consists of a multi-professional team. The panel perceives a broad expertise in the various approaches to do qualitative research. Yet the group might want to focus on a selection thereof.

The group has been attracting some large grants to pay the position of the head of the group and some PhD projects.

**Networks and collaborations**
Collaborations with political sciences and the Department of Business Studies at Uppsala University are established or under way. With particular regard on patients’ choice this needs to be safeguarded. As the panel sees some overlap with the departments’ unit of caring sciences this collaboration should be strengthened. This young and promising group needs to be stimulated by international exchange. Currently, two members from the group were abroad for more than three months.

**Opportunities for renewal and emerging science**
The most promising area to go for would be the more political perspective of privatization of health care as this is an issue in many other jurisdictions. Within this rather broad field we recommend the group to take up more specific questions. Also, although less innovative, telecare issues are particularly relevant nowadays.

**Actions for successful development**
The panel sees some possibilities for further improvement:

- To develop a strong health services research unit the group needs to work in a more international context or network. People at all career levels need to be sent abroad in order to establish networks with internationally leading groups in the respective fields.
- We were told that health services research is not funded in Sweden as much as in other European countries. This funding problem needs to be solved at a national level to allow the group to attract funding.
- The research questions may be phrased more specifically. Also, it is questionable whether it is wise to focus on the macro- as well as the meso- and micro-level.
- Overall we think that this group needs to have its place in the department for the relevance of the research on privatization. Yet, the groups’ independence is not necessarily fruitful. It might need to link or merge with some other units in the department or another department at Uppsala University.
Oxidative Stress and Inflammation

General assessment of the unit
This group is working in the field of research on inflammation in physiology and in disease states specifically with bioactive eicosanoids. The quality of this group is difficult to judge for the panel as the content of its investigation is beyond its field of expertise. The overall evaluation of this group considers the fact that it is small on the one hand and that on the other the leader is only onsite one week per month, splitting time between his primary post in France and limited weeks per year in Uppsala. At the same time, he has ten major projects taking place in six countries. The effects of the KoF07-evaluation are not seen because the researcher has only had this group at Uppsala University since 2009.

Quality of research
During the last four years, the lead investigator is listed on 62 refereed journal articles with multiple co-authors. Many of these papers are in highly ranked international journals. He is the first author on 9 of these papers. Yet, from his presentation and bibliography, it is difficult to know what his contribution was to many other papers. He reported that he had little funding for his research. He has a very small group in Uppsala. Given our knowledge in the area we do not feel we can give a well founded judgment of the quality of the research done.

Research environment and infrastructure
The lead investigator has many projects, little funding and is not on site for much of the year. Also, this research program does not fit well into the rest of the department. Thus, the group leader functions quite isolated. In Uppsala, he works with staff in the medical sciences who work on inflammation so he might be better placed in one of these groups. Certainly, in terms of subject matter and time on site, this group does not fit into the rest of the department and it remains unclear how the investigator can run multiple projects in different countries from two different places. Indeed, the program leader would like to be placed elsewhere but this was not possible so far.

Networks and collaborations
The group leader has extensive international networks. He is professor of excellence in France and has appointments and ongoing work in the U.S., U.K., France, China, Bangladesh and Norway.

Opportunities for renewal and emerging science
Given our expertise, from the information provided and the meeting with the panel, we had difficulty formulating opportunities for renewal and emerging science.
Actions for successful development
The researcher reported that he currently self finances much of his work. Successful development would entail attracting an adequate and consistent funding stream to support his multiple international projects.

Preventive Medicine

General assessment of the unit
In consequence with the recommendations in KoF07 a new professorship was installed in preventive medicine. The person who was appointed has a very good track record and an impressive network of collaborating partners both nationally and internationally. Furthermore, he has excellent knowledge in statistics and methodology which is critical for high quality research in preventive medicine. He also has impressive administrative experience and has worked both on the ministry level and with county councils.

Despite the fact that he was appointed 2008, the new professor has not yet established a research group at Uppsala University but has to a large extent continued to carry out his research with his former group at the Karolinska Institutet. Thus it is at this stage not clear which research line he will pursue and integrate into the Department of Public Health at Uppsala University. However, based on his previous accomplishment, the potential for innovative and creative research is promising. One of his most interesting plans is to establish a centre of public health and prevention in collaboration with the County Council. Now becoming head of department will give him tools and possibilities to further strengthen the quality of his work.

Quality of research
The only research that can be evaluated is that accomplished at the Karolinska Institutet. The quality of this is excellent and top-quality in the field.

Research environment and infrastructure
In general, the research environment is good but since the new professor so far does not have a formal unit, the specific environment and infrastructure cannot be evaluated. However, to be successful, the group to be will: a) need strong data bases and maintenance of these for long-term use, and b) need to be able to attract highly competent people from various disciplines to build these bases and to attract funding. Furthermore the relationship with the County Council should be strengthened.

Networks and collaborations
As pointed out above the new professor has a broad network which is one of his most important assets when he is going to create an internationally competitive research unit in preventive medicine in Uppsala University. The collaboration
with groups at the Karolinska Institutet should be preserved and new collaborations should be built with several departments at Uppsala University and clinics at the Academic Hospital. Also, structural collaboration with other groups addressing epidemiology at Uppsala University should be fruitful.

**Opportunities for renewal and emerging science**
In addition to the opportunities suggested above, cooperation with the Department of Forensic Medicine on ‘triggers’ could be one new line of research.

**Actions for successful development**
Suggestions for successful development are:

- to build strong, long-term collaborations with the County Councils and the communes;
- to intensify the collaborative work with existing groups in the department and develop research strategies for the future for common lines of research. This could be done by linking or even merging the unit of preventive medicine with social medicine and social epidemiology as well as part of family medicine and clinical nutrition;
- to attract more senior staff.

**Psychosocial Oncology and Supportive Care**

**General assessment of the unit**
The psychosocial oncology group addresses psychosocial health among patients with somatic diseases and their significant others. It has a background in pediatric oncology. It was settled recently having received a large grant from the Swedish government from 2010 – 2014 to establish their U-CARE program. It worked with longitudinal designs earlier but recently embarked on intervention studies. The costs involved in psychosocial care are studied along with its effectiveness. The group addresses a problem of great societal importance and a great need to further strengthen its evidence base. Given this relevance and the opportunities provided by their funding, the group has a large potential for future growth. The group has to be commended for already considering implementation of their results eventually.

**Quality of research**
The group is to be complimented for attracting a truly interdisciplinary team. Moreover, the panel encountered a group of open minded researchers. Their output in high standing international peer reviewed journals is still limited though. The research is therefore graded as internationally recognized. At the same time, it seems to have the potential to grow into an internationally high standard group over the coming years. The panel was impressed by the contribution from information science providing an electronic platform that might
support a variety of future research efforts. Moreover, an international perspective is actively pursued.

**Research environment and infrastructure**

This group seems to have built a real research line with a clear structure. Given their large funding the U-CARE group has the possibility to build a fruitful research environment over the coming years. It will obviously have to develop a strategy to maintain its position after 2014. There is some overlap with work in other areas within the department, notably family medicine and caring science.

**Networks and collaborations**

The group has good collaboration with different faculties such as the social science and medical faculty. There is limited international cooperation yet but the group has established an international advisory committee. True exchange with high standing groups working in the areas of psychosocial oncology might be fruitful and stimulating. Organizing international longer term visits and, if possible, participating in international studies will enhance and stimulate the quality within of the group.

**Opportunities for renewal and emerging science**

To be innovative, the psychosocial oncology group will benefit from more in depth studies into the effectiveness of different intervention types and elements thereof. A clear overarching research question as well as a theoretical framework are still lacking in the clinical psychology area. Which endpoints are selected and what economic approach is taken, could be formulated more clearly. The study designs in this areas are known to be complicated for ethical as well as practical reasons. Still, as the group moves towards intervention studies, it might think through about more thorough approaches. The same goes for the psychophysiology measures proposed. Their contribution is still uncertain.

**Actions for successful development**

The panel considers some actions needed and/or desirable to become internationally competitive:

- building on a further theoretical framework will improve the quality of the group's output;
- considering the development of the economic approach;
- promoting international collaboration and exchange;
- collaborating within the department with other groups addressing psychosocial care to improve homogeneity;
- further discussing of whether U-CARE should focus on psychosocial oncology only or embark on studies in other diseases also;
- considering whether the group should call itself 'psychosocial oncology'.

Part III: Panel Reports

Panel 21
Social Medicine and Socio-Medical Epidemiology

General assessment of the unit
The social medicine group consists of two more specialized units: Social Medicine and Socio-medical Epidemiology. The overarching theme of both research groups is to analyze different types of excluded populations and social inequality and to develop effective strategies to integrate these unprivileged, sometimes marginal groups into Swedish society and social life. The group as a whole integrates both a system related as well as an individual biologic approach. The group’s aim is to advance understanding but also to help delivering effective strategies that can be cost-effective. The problems addressed, (un)employment and refugees, are considered of great importance for the Swedish society as well as the international community. Moreover, the Swedish community has a relatively large ratio of immigrants. This allows for more in depth study of their living situation than would be possible elsewhere. Therefore, these issues certainly deserve the attention given.

Quality of research
It is somewhat difficult to judge the two social medicine groups together as there seems to be limited synergy in terms of content or collaboration between them. Moreover, their methods as well as their embedding internationally are different. The Social Medicine group has a good granting record as well as internationally recognized publications. It combines laboratory based and community based research as well as the enhancement of cost-effectiveness studies. The publication record in terms of quality and number of publications is reasonable. The granting has increased since KoF07. At the same time the group might consider to publish in higher impact journals. Also, the use of bigger sample sizes and more rigorously controlled studies is necessary. The panel considers the quality of this group to be of international recognized standard.

The Socio-medical Epidemiology group seems different. It has been founded more recently. The group’s output in terms of publications in internationally peer reviewed journals is quite limited so far. The funding of this group is not strong either. A recent EU grant to cover immigrant issues seems to have been obtained. The panel considers the current quality of this group’s research to be insufficient.

Research environment and infrastructure
The two groups work together in the Centre for Environmental Health and Stress Research (CEOS). The Social Medicine group is relatively small given its ambitions. Also, the program leader holds a joint appointment at Uppsala University and at Wayne State University (USA). The panel considers this to be a serious risk factor. The absence of the principal investigator not only may hamper the day to day supervision of graduate students. Also, the daily management of this group has to be partly taken over by the other professor in the social medicine group.
The social medicine group as a whole mentions the lack of (bio-)statistical support from the department.

**Networks and collaborations**
The social medicine group has good national and international collaboration. The socio-medical epidemiology group mentions a large number of collaborations nationally as well as internationally. However, these have not yet clearly lead to important joint publications. The newer collaborations with for example the group from Rotterdam addressing avoidable death and the London School of Hygiene can have potential value for the near future.

**Opportunities for renewal and emerging science**
In the social medicine group, the combined use of more traditional questionnaire design studies and of psychophysiologic stress measures is attractive and promising. At the same time, the wish to address epigenetic factors is interesting but cannot be achieved yet given the lacking of experience within the group. Collaboration with experts from Michigan might enable the group to further this challenging research area. Stress and performance in high risk populations is a promising area of interest.

**Actions for successful development**
- The lines of authority and leadership in this group are not clear to the panel. They should be considered by the department’s leaders, especially given that one of the leading professors is mainly absent.
- As other groups, this group has expressed the wish to see a methodological core in the department. In such group economic expertise would be needed.
- As earlier, the groups display a need for focus. In the social medicine group, the role of the third research line mentioned: ‘health care reform and patient centered health care’ is less evidently linked to the other two. Its inclusion might therefore be reconsidered. The epidemiology’s group formulation of its research focus was broad and even less clear. The macro-level approach, avoidable death and the methods to study those, seems to be most promising.
- The panel wonders whether better use of national data sets is possible for this group.
- More rigorous research designs would strengthen the ability of the group.
Scope of the panel's evaluation:
Department of Medical Sciences
Department of Women’s and Children’s Health

Introduction
Our panel members, except for the Chair, had not taken part in KoF07. We were very appreciative of the effort taken to make our task as trouble free as possible. In particular, on this visit we were given a print out of the slides used by each of the many people who presented on behalf of their research groups. (an improvement for the future would be to include a portrait of each presenter to help later recall).

We were impressed by the overall quality of the research, with several groups reaching the highest international standards. There were probably other groups we did not see, so we have no comments on these. Nor have we had the opportunity to see the panel 22B report.

We have tried to give our impression of the relative strengths of most of the groups, but recognize that these snapshot judgments are likely to be prone to error. The Chair was very surprised at the progress made in the relatively short period of 4 years, partly from take up of some of the KoF07 advice, and mainly by the establishment of the Science for Life initiative. In particular we were impressed by the emphasis on using new genetic information, and also by the commendable joint ventures with veterinary studies. The co-location of these two facilities does not occur anywhere else in Sweden, and should be exploited as much as possible. There had also been considerable improvement in the formation of core resources such as computing, biobanking, and other shared facilities.

Sweden spends a commendable 4% of the national budget on R&D – of which about 75% comes from corporate or industry sources. We were told that about SEK 14 billion was direct support to universities, 8 to research councils, 6 from other government bodies and SEK 2 billion per annum for defence research.

The Department of Medical Sciences budget comprised about SEK 200 million, with an additional SEK 65 million ALF funding. On the one hand these ALF monies (for the costs of the periods designated for research) are jealously guarded by the county hospitals, but on the other hand our panel felt that this sizable source of research funding was not spent wisely in many cases, and so was often underspent! It is also important to note that many of the ALF projects are not openly subjected to peer review (unlike other Swedish universities).

We saw some outstanding students who had clearly prospered from ALF funding – although sometimes at very hard personal demands on their time,
since the demands of routine patient care prevented the theoretical available
time of 25% for research being actually available in practice. But the non-Swed-
ish panellists were surprised at the advanced age of the clinical students is at
odds with other European programs – where the research period is taken earlier,
and is full time. We suspect that we were (understandably) introduced to the
best students, and that some might have had a less satisfactory outcome.

Some of the County Hospital chiefs (but certainly not all) were thought
to be rather unsympathetic to research, and used these students as “pairs of
hands”. The situation is further complicated, since the longer a student stays
in a lower grade status the more the county hospital budget is spared the need
to pay them a specialist salary – a perverse financial incentive for the hospital!

Although this ALF program was nominally under university supervision, the
actual academic influence was distinctly limited. Furthermore, the current ALF
funding in Uppsala is decided on a yearly basis, which means that some funding
becomes unused and wasted. We understand that in Stockholm the ALF awards
can be negotiated for a more realistic three year period. The few graduate stu-
dents that we met were impressive, particularly in the face of the limited time
that some of the ALF fellows had for this activity. Efforts should be made to
allow for longer periods of research for these fellows. The ALF system is unique
to Sweden and is regarded as a valuable resource for clinical research.

This less than satisfactory situation in Uppsala was commented on at length
in the introduction to our report in KoF07. We understand that this has not
changed in 2011 – and might even be worse.

We still believe that this should be pursued at the highest governmental
level in order to try to achieve better value from this substantial funding, with
the aim of solutions equitable to both sides. If this could be resolved we believe
that the current tensions between the leaders in County hospitals and the aca-
demic professoriate might be very much reduced – with benefits to both sides
of this rather artificial and damaging divide.

Department of Medical Sciences

We were provided with a particularly helpful report, including a very practical
print out of slides, from this department.

Science for Life programme

The Science for Life project in Uppsala is for the most part still a virtual pro-
gramme, not residing in a specific building/construction as it is in the Stock-
holm/Karolinska Institutet, which is the other arm of this programme (pres-
ently with twice the amount of funding compared with Uppsala). This is a very
ambitious program, which will need continuous support for future realisation.

Below we summarise the different projects operating within the Science for Life programme.

**Coagulation/Inflammation**
Grade 1–2 (Top-quality – Internationally high standard). This is a strong component of the programme with an advanced international position in the role of tissue factor in coagulation processes. The research is supported by a strong laboratory experimental back-up, physically linked to the clinical unit. It is a commendable example of integration of clinical and experimental research.

**Systemic autoimmune disease**
Grade 1 (Top-quality). This is clearly a programme which reaches the top international rank. It is an excellent example of the combination of clinical observation with refined analysis in experimental models – including identification of genetic markers. The relation between the increase of stroke in this patient material and the coagulation research should be fully exploited.

**Molecular medicine, SNP platform/ Affymetrix platform**
Grade 2 (Internationally high standard). These two groups have developed new programmes which are complementary and provide important support for many research projects within and outside the department. At present these are two separate platforms which might well benefit from being merged. We understood that this would need some core funding to achieve the merger. It seemed clear that the university must see to it that the recruitment of young faculty to this group is supported. The university approval processes for recruitment had been too slow to secure the best candidates in this fast moving field. The present separate strengths in bioinformatics and statistics need further development and coordination. This is a vital core facility for the Science for Life programme.

**Autoimmunity**
Grade 1 (Top-quality). This is a world-leading group studying the basis of organ-specific autoimmune disorders. They have published seminal findings in the *New Engl. J. Med.* and *Proc. Natl. Acad. Sci.* Their latest results in para-neoplastic disorders and in animal models, e.g., Diabetes Mellitus in Border Collies, are groundbreaking. The group has strong leadership and is exceptionally worthy of additional support, so as to maintain their international lead in research in this important area.

**Renal medicine**
Grade 3–4 (Internationally recognized standard – Acceptable standard). This group is working within the highly competitive and important area of cardiovascular disease in chronic kidney disease (CKD). The group is assessing interest-
ing observations such as the use of blocking IL6-R, IL1-R, and TNF alpha, and has plans for a number of other research activities, e.g., studying biomarkers and telomerase shortening in CKD. The group should be encouraged to prioritise its research objectives and to focus on some fundamental projects that would be competitive for peer-reviewed funding, such as the FGF23 programme.

**Biological structure and function**
Grade 2–3 (Internationally high standard – Internationally recognized standard). We were impressed by the potential clinical applications of production of antibodies in eggs of immunized chickens. The antibodies were then isolated and given as an oral solution, to combat infections in patients with cystic fibrosis by non-antibiotic means.

**Gastroenterology and Hepatology**
Grade 3 (Internationally recognized standard). This department has a new leader who is developing a new program. At present, the focus is on biomarkers in Inflammatory Bowel Disease, as well as airborne (NO) or serum-borne (cytokines) markers for inflammation and ulcerative colitis – which could have important clinical applications. However, the program needs also to develop its’ research in pathogenesis to be in the top tier. There was collaboration with industry in development of a wireless gastrointestinal diagnostic capsule measuring pH, pressure, temperature and motility.

**Dermatology**
Grade 2–3 (Internationally high standard – Internationally recognized standard). This programme is a comprehensive approach to rare dermatological diseases, with commendable combinations of clinical studies of rare conditions with defined genetic mutations – with tissue culture and animal models to understand pathogenesis and potential therapy. It is important to maintain this research on rare skin diseases, which lack research support.

**Epidemiology**
Grade 3–4 (Internationally recognized standard – Acceptable standard). There is new collaboration between areas of epidemiology, and we were pleased to see coordinated efforts to maximize the use of their cohort studies. In collaboration with Lund University two new collaborative and integrated studies have received governmental funding; the EpiHealth cohort study and the MetaHealth project. The EpiHealth is a very large study that focuses on collecting phenotype data and biological specimen from large number of Swedish subjects (300,000) with the aim of exploring interaction between environmental factors and sequence variations in the human genome. This study, now in its infancy, is going to generate a very valuable resource for investigators for many years to come. However, it is going to be very costly and take many years for completion. Investigators in the department are thus encourage by the panel to compli-
ment this activity with studies similar to the MetaHealth project were use of data from existing nationwide registries (perhaps the most complete registries worldwide) with currently available biological data. The focus should be on generating genetic and other complementary data for full use of all the clinical data already available in registries and hospital records, similar to the activities planned for the MetaHealth project which will only focus on rare diseases and conditions. More common conditions should and could also be explored in this manner. This integration is new, and it seems important that they identify the key questions of disease pathogenesis and outcomes which could be addressed by their currently available cohorts. Many of the studies so far appear to be confirmatory rather than original. Perhaps there is an opportunity for collaboration with social sciences in formulating future research.

**Osteoporosis**
Grade 2 (Internationally high standard). A well focused approach to understanding the basis for the high incidence of osteoporotic fractures in Sweden and Norway that has resulted in identification of an interesting role for Vitamin A in bone biology. The group has successfully followed up on their original paper regarding the association between high retinol levels and fracture risk, and has promising data in a mouse model. The group is a leader amongst the Epidemiology department in taking its observations into mechanistic insights. Strong infrastructure support is recommended to facilitate these translational aspirations.

**Pharmacogenetics**
Grade 2–3 (Internationally high standard – Internationally recognized standard). The main focus of this group has been on the pharmacogenomics of warfarin, the anti-coagulation drug. Some years ago the group identified variants that predict sensitivity to warfarin, and these are the only variants that have been identified to date. The group takes part in many international collaborations, including leading randomized clinical trials. The group has now initiated studies on rare serious reactions which will involve identification of factors that predict reactions (through genome-wide associations of sequence variants). This group is strong, with good research focus.

**Infectious disease and microbiology**
Grade 2–3 (Internationally high standard – Internationally recognized standard). Infectious diseases were presented as three different lines; the zoonotic infections, the problems of antibiotic resistance and its epidemiology, and finally clinical and experimental studies on septicemia.

The most original part was the part on zoonotic infections (grade 1–2; Top-quality – Internationally high standard). The importance of the new observations by this group for human diseases is obvious, but still not fully worked out. Yet the role of migrating birds in the spread of infections in man promises to be
an important tool for the study of influenza, for example. The work on control of antibiotic resistance is very clear and important. The resurrection of colistin, an old toxic drug was interesting, as an example of the balance between toxicity versus efficacy in severe infections with antibiotic resistant bacteria.

The experimental work on sepsis in pigs is an interesting and promising model for minimizing organ damage by bacterial toxins, under controlled conditions.

**Cardiology**

Grade 2–3 (Internationally high standard – Internationally recognized standard). The Uppsala Clinical Research Centre (UCR) has developed a very strong program for the evaluation of clinical interventions in acute coronary syndrome by the use of randomized controlled trials – in which this group is clearly of high international standard. This is an excellent facility for clinical research, including all aspects of, from project planning to manuscript preparation.

The group using biomarkers before and after ischemic episodes have developed novel markers for prognosis in patients with ischemic heart disease.

An enthusiastic new group is doing important research and trials for the treatment of arrhythmias. We were impressed by the collaboration with the veterinary department, where novel mutations causing arrhythmia have been identified in dogs.

**Cancer**

**U-CAN and cancer research**

The cancer division is part of the Umeå and Uppsala consortium, with the aim of collecting tumor and blood samples from cancer patients for biomarker and genetic analysis. This project has just started; it is very ambitious and if given the proper support for collection and genetic analysis is going to place the Uppsala cancer research in the forefront of cancer research world-wide. This consortium is part of the Science for Life Lab, and will thus be able to use the technical and analytical resources, which will be essential for the project.

**Endocrine Oncology**

**Endocrine Tumors.** – Grade 2 (Internationally high standard). The group has established excellent resources to study the genetics of ileal carcinoids, tumor biology of gastrointestinal neuroendocrine tumors (NETs), expression of neuroendocrine markers in breast cancer, and clinical trials in NETs. There is strong leadership and established resources that have enabled productive links to be forged between the clinical and scientific activities. The group is well placed to make contributions at an internationally competitive level. Strong support is recommended.
Biomarkers and Treatments. – Grade 1 (Top-quality). This group is an international leader, now embarking on new and competitive challenges, using state-of-the-art techniques. Some of the lead molecules and microRNAs appear promising. The group is capitalizing on its expertise in developing new peptide receptor radio therapy, nanomedicine, oncolytic viruses and nanotechnology. The group has ambitious and competitive plans and given their excellent track record, very strong support is recommended.

Endocrine Tumor Biology. – Grade 2 (Internationally high standard). The group is engaged in clinical and translational research of endocrine cancers associated with Multiple Endocrine Neoplasia type 1 (MEN1) and adrenocortical carcinoma. These are internationally collaborative studies, e.g., the FIRM-ACT study for the treatment of adrenocortical carcinomas. The group is competitively placed to pursue these clinical trials. The group also proposes molecular biology studies using MEN1 tumors, and these appear promising. Strong support is recommended.

Cancer Pharmacology and Haematology. – Grade 2–3 (Internationally high standard – Internationally recognized standard). The aim of this group is cancer drug discovery, prediction of mechanistic of action, and determination of drug activity using computational medicine. A pipeline for cancer drug screening has been implemented and compounds have been identified with oncogenic associations, and specific response in both colorectal cancer and acute myeloid leukemia. The screening model looks promising. The computational aspect of this work is in its infancy and more data is needed to fully explore the computational capacity.

Endocrinology and Diabetes

The recently appointed coordinator demonstrates considerable energy, intellect, and enthusiasm that will bring benefit to this area.

Experimental Diabetes and Diabetes Studies
Grade 1 (Top-quality). An internationally competitive programme in islet cell transplantation and in stem cell therapy, that include very interesting studies in islet vascular physiology. The group leader has been in post for about two years and has established an excellent programme that is innovative. Strategic funding from the Swedish government has been obtained. In addition, the links with transplant teams and adequate infrastructure to pursue this programme are in place. Very strong support is recommended with recruitment of young scientists and clinicians to this field.
Endocrinology
Grade 4 (Acceptable standard). The group is investigating the endocrine, metabolic and cardiovascular effects of weight loss following gastric by pass surgery, and has access to the Swedish registry. These are interesting projects and the group would benefit from a prioritization of its projects with links to other groups with relevant expertise.

Diabetes Nursing Research
Grade 4–5 (Acceptable standard – Insufficient). This is a very important area involving patient education and research into life cycle measures. The group is undertaking an evaluation of its interventions, which is commendable. However, the work of the group would benefit considerably by engaging with triallists, methodologists and strategists, and seeking advice from appropriate experts.

Department of Women’s and Children’s Health

International Child Health and Nutrition
Grade 3 (Internationally recognized standard). The research group on International Child Health and Nutrition presented an impressive number of projects that were generally in collaboration with researchers in many low income countries (LIC). The projects focused on four themes; Improving neonatal survival, improving maternal and child nutrition, social conditions and child health, and environment and child health. In commendable collaboration with local researchers, this group had performed difficult field studies, including randomized trials which have influenced practice. This group has expanded since 2007 and published 16 peer reviewed papers in 2010. We recommend further strong support from the university, even though funding is presently quite good from other sources.

International Maternal and Reproductive Health
Grade 2–3 (Internationally high standard – Internationally recognized standard). This unit with a new and dedicated leadership for the last 3 years, has a strong and well established profile for the department and the university. They have gathered a research group of 8 seniors, 6 postdocs (with varying degree of research time) and 17 graduate students. Numerous international collaborations, and considerable funding create a solid basis to continue work to contribute to improve women’s reproductive health and rights in a worldwide perspective.

Reproductive Biology
Grade 3–4 (Internationally recognized standard – Acceptable standard). This group is supported by a small but well equipped research laboratory which
allows experimental work on, e.g., cell cultures, immune-histochemistry and DNA/mRNA analysis. Interesting projects, that relate to the expanding field of in vitro fertilization (IVF) such as epigenetics and vitrifications, role of sperm prostasomes for conception, and embryo – endometrial interactions were outlined. Basic work on endometriosis is important to improve diagnosis and treatment of this common disease. However, we felt that the group should concentrate their efforts, and focus on a few major projects.

Obstetrical Research
Grade 3–4 (Internationally recognized standard – Acceptable standard). Obstetrical research is mainly on clinical and patient focused studies in pre-eclampsia, in collaboration with the large maternal ward and delivery unit at the University hospital. But there were also promising trends to go deeper into pathophysiology, and to assess biomarkers and angiogenesis. In the fall of this year the unit will have new leadership that eventually could change the focus more towards epidemiologic aspects.

Gynecological Endocrinology
Grade 2–3 (Internationally high standard – Internationally recognized standard). This small group has been focusing on the effects of estrogen on cardiovascular disease, and has developed novel principles for non-invasive arterial wall imaging, using ultrasonography. In addition, tandem-mass spectrometry studies have been undertaken of follicular fluid from patients with polycystic ovarian syndrome and controls, and enzyme activity of CYP17 and CYP19. These have yielded interesting results.

National Centre for Knowledge on Men’s Violence against Women (NCK)
Grade 4–5 (Acceptable standard – Insufficient). NCK is commissioned by the Government to compile and spread knowledge, provide training, and to develop methods to help and provide support for women subjected to violence. As such it acts primary as a service center that provides nationwide helpline, education, training (university courses), outlines national action programs for management of victims of sexual assault, puts together an evidence detection kit, and operates a web based interface knowledge bank with reports and research material from various research disciplines from Sweden, Denmark and Norway. The research effort appeared limited and could greatly benefit from more support. For an academic unit the center’s own research activity appeared to be poor. We urge the unit and the university to promote properly directed research efforts They are undoubtedly providing a service, but this lacks evaluation.

(Note: The research activities in this unit are difficult to compare with the other units appointed to panel 22A. Most of the resources to NCK from the Government have been destined for activities other than pure academic research. For a background on the NCK task and obligations, please see the Government Ordinance [SFS 2006:1072] on the Na-
Reproductive Health
Grade 1 (Top-quality). The group of reproductive health is newly established, and under creative and dynamic leadership. From a background knowledge of the neuro-endocrinology of the female brain the overall aim is to improve the mental and sexual well-being of women of all ages. Recruitment for a large perspective study on antenatal and postpartum depression is ongoing and likely to produce high-quality data on both biological and psychological mechanisms for this disease. Funding is good and publication activity is impressive.

Pediatric Endocrinology
Grade 3 (Internationally recognized standard). This group utilizes methodology for studies of energy metabolism using stable isotopes is promising, and has yielded interesting results on glucose production and lipolysis in pregnant women and their offspring. This unit has also taken advantage of the excellent possibilities for long term follow-up through registries. The results of conscript examination at age 18 compared to birth data from the same individuals. They have demonstrated increased occurrence of obesity in adulthood in individuals that were born either small or large for gestational age. Other projects include the effects of growth hormone in Downs Syndrome, and glucose metabolism in the brain under perinatal asphyxia and hypothermia. In future, this unit plans to go deeper into relations between obesity and epigenetic imprinting. Continued support is recommended.

Paediatric hematology and oncology
Grade 3 (Internationally recognized standard). Research accomplishments and ongoing activities were presented for three groups: Leukaemias, Solid Tumors, and Neural Tumors. The field of Paediatric Oncology in the Nordic Countries has been characterized by great integration of treatment protocols. Over the years this has resulted in remarkable improvements in survival. Therefore much of the present efforts are directed towards delineating late side effects of anti-cancer treatment, and to the psychological and ethical problems for both patients and their family members. This is a commendable ambition. New hypotheses of the importance of tumor hypoxia are interesting and merit future research. Variations in CpG methylation patterns are explored as possible biomarkers for classification of childhood leukaemias. These research areas indicate that the unit is ready to pick up new approaches to etiology and treatment of childhood cancers.

Paediatric neurology
Grade 3 (Internationally recognized standard). The most promising area of re-
search in the section dealing with paediatric neurology seems to be the studies on perinatal neurology, notably recordings of EEG in prematurely born babies. This may develop into a prognostic instrument in, e.g., perinatal asphyxia.

**Perinatal, Neonatal and Cardiology Research**

Grade 3 (Internationally recognized standard). Out of the multifaceted spectrum of research carried out on respiratory problems in new born children, the unit presented studies on the possible effects of NO on pulmonary vascular resistance. It seems to us that this is an attractive hypothesis that will be proven or disproven in the coming years. The unit also continues in the footsteps of previous researchers in this group – studies on fluid balance in prematurely born children. The publication rate of this group is limited; only three original reports during 2008 – 2011.

**The General Paediatric Research Group**

Grade 3 (Internationally recognized standard). This seems to be put together from groups that do not fit into the previously mentioned groups. In the KoF07 document, it was suggested that The Paediatric Inflammatory Research Group should get together with other groups studying inflammatory diseases. This has not occurred, and the research presented was directed towards the use of NO as a diagnostic and possibly therapeutic tool in lung disease. The publications on this topic mostly seem to have first and senior authors from other departments.

**Paediatric Surgery and Paediatric Urology**

Grade 3–4 (Internationally recognized standard – Acceptable standard). This is an active group undertaking many investigations in the fields of gastroenterology and urology. A number of gastrointestinal studies are pursued and the one that was outlined related to the problem of intestinal adhesions after abdominal surgery. They use a combination of molecular, pharmacological and clinical methods to explore the etiology and possible modes of treatment. Several urological studies are also being pursued. The one described was that investigating the long term value of a previously described intervention (Deflux®) to treat vesiculouretral reflux; the aim of this study included assessments of renal and urinary tract function, long term results and health-economic cost analysis. This group has a diverse range of projects in its portfolio – perhaps too diverse.

**Acknowledgements.** We thank Uppsala University for the privilege of this visit. We all learned a great deal from our meetings with this distinguished faculty, and we are sure that our visit will foster some future collaboration between both groups. We were also grateful that the workload of this panel had been made more manageable than in KoF07. As we remarked earlier in this report we were very impressed with the great improvements in the research output and in the faculty organization in only four years. There had also been a sea change in the near total embrace of the new biology of genetics & molecular medicine.
Panel 22B

Scope of the panel's evaluation:
Department of Surgical Sciences
Department of Radiology, Oncology and Radiation Science

Department of Surgical Sciences

General comments
In clinical departments, like the Surgical Department, the platform for research should be the clinical activity. Without a certain mass of high class surgery it is very difficult to conduct high class research in surgery. Clearly excellent research is possible to make in connection even with a small surgical platform, but then there is a tendency that such research will live a life of its own mainly outside the surgical environment. This tendency, which is not helpful for surgical research, was seen in many surgical clinics.

The research projects in surgery selected to be presented were led either by the professor in charge, or surgeons not officially in charge of the research at the clinic. It turned out that research conducted by the professors seemed quite vulnerable in the way that many of them had continued too long with the same research areas, which they had been familiar with for a very long time. Such research is in danger of loosing interest and power, if not young research colleagues are taken onboard. The time of retirement had apparently not been anticipated and handled adequately in many of the surgical research fields.

It is vital that surgeons interested in research should get that possibility by the professor and the concrete help from the university by having dedicated time periods for research. This is of course a universal problem, but most important to be solved in a practical way particularly in the postdoc period, as seen in some of the research areas.

We tried to compare the present research activities with the previous evaluation just four years ago. In our panel we a had good possibility to do that since most panelists had taken part in the previous evaluation.

Anaesthesia and Intensive Care, Cardiac Arrest
(Sten Rubertsson)

General assessment of the unit
The cardiac arrest research is expanding and now includes epidemiology, imaging techniques as well as and autopsy and biomarker studies. The different
research lines are very active and well organised. Focus is on mechanical chest
compression and neuroprotection.

**Quality of research**
Internationally high standard.

**Research environment and infrastructure**
Good. The group is well established.

**Networks and collaborations**
Many, such as with Stockholm and Göteborg.

**Opportunities for renewal and emerging science**
Imaging techniques of the brain, such as brain temperature, can be elaborate
upon to test the effects of various CPR interventions. A technique to cool the
brain via the nasal cavity is simple enough to be used in the pre-hospital setting,
and should be evaluated.

**Actions for successful development**
The group has a broad scope and involves many scientists, mostly from the
division of anesthesiology. Several young doctors are also involved. The group
would benefit from formulating some clinically important questions and focus
on them.

**Effects of the KoF07-evaluation**
None, as self-reported.

**Anaesthesia and Intensive Care, Ventilation**
(Anders Larsson)

**General assessment of the unit**
Very active group of good international quality. Much present work is per-
formed on animals in the setting of the Department of Physiology. There is
also an interset in ECMO treatment. Clinical evaluations of ventilation modes
(spontaneous/differential) in acute lung failure in humans are also performed.

**Quality of research**
Internationally recognized standard.

**Research environment and infrastructure**
Good but not optimal. Advanced imaging techniques are available, but at some
distance from the animal laboratory.
Networks and collaborations
Several national and international groups collaborate with the group. There is also a collaboration with the medical company Maquet, which funds some of the research. The value of these did not become apparent.

Opportunities for renewal and emerging science
A presented finding is that ventilation in itself induces inflammation and might contribute to the development of ARDS. While not a new finding, the possibility to image the inflammatory activity could be useful. This issue is of great interest to intensive care and can be expanded.

Actions for successful development
Translate animal model findings into studies in humans. At present, these lines seem to be separate. The group is very active but deals with too many research lines (12 as given in the annual report) to manage all of them well. Virtually all projects deal with lung mechanics and ventilator strategies as treatment, while pharmacological intervention and other approaches seem to be far in the background.

Effects of the KoF07-evaluation
The research was previously managed by professor Hedenstierna from the Department of Physiology, who is now retired.

Anaesthesia and Intensive Care, Pain Research
(Torsten Gordh)

General assessment of the unit
Competitive research on chronic pain. Works include imaging, search for biomarkers, genetics in patients with persistent postoperative pain, microscopy, and evaluations of drug treatment.

Quality of research
Internationally high standard.

Research environment and infrastructure
Very good.

Networks and collaborations
Well developed nationally and internationally where pertinent parts of analyses, etc. are performed. An important contact is the Berzelius collaboration in Uppsala, which is apparently well-funded. Gordh’s group is to a great extent funded by an insurance company.
Opportunities for renewal and emerging science
Gordh described a marker method to distinguish patients with persistent pain after injuries from those who don’t, and this finding is indeed very interesting and can be investigated further. The methods and approaches used in the studies were felt to be pertinent.

Actions for successful development
The studies of markers that could be define areas of chronic pain by PET imaging should be further pursued.

Effects of the KoF07-evaluation
None, as reported by the research group.

Endocrine Surgery Group
(Göran Åkerström, Per Hellman, Gunnar Westin, Peyman Björklund, Peter Ståberg)

General assessment of the unit
The Endocrine Surgery Group has a broad research profile, it has very close collaborations with the endocrine oncology group. The research activity includes clinical research, as well as a very impressive, comprehensive program for the molecular analysis of endocrine tumours (miRNA, microarray, genomic analysis). The group is internationally recognized. It has produced 117 papers during the last three years, some papers in top level journals and most others in top level endocrine journals. The group consistently publishes in top journals of broader interest (Science, NEJM, JCO), and multiple other publications.

Quality of research
Top-quality.

Research environment and infrastructure
The center functions a referral hospital getting patients from all over Sweden and to some extent also from abroad. Thereby the clinical material is substantially larger than the population base provides. The group includes both experiences researchers and younger professors, senior surgeons, as well as several clinical research students and preclinical research students. The group has collaboration with endocrine oncologists, with department of imaging and with basic scientists. It has been able to establish a tissue bank containing an impressive number of annotated tissue samples used for co-operations worldwide (now part of the biobank in Uppsala).

Networks and collaborations
The group has a large network of national and international collaboration with groups from Europe, U.S. and Australia.
Opportunities for renewal and emerging science
The group has many promising plans for the future. Recent findings describing genetic changes in several endocrine diseases will apparently be followed by new discoveries. Plans together will collaborators might lead to new targeted therapy modalities.

Actions for successful development
The research already holds high quality and it might be demanding to further improve it. The group should be strongly supported in building a central genomics facility (including deep sequencing units) that can be used by other centers at the Campus.

Effects of the KoF07-evaluation
After the KoF07-evaluation this group was appointed Center of Excellence. The group received one postdoctoral position from Uppsala University and another research fellow position from the Uppsala hospital. Both the investigators and the reviewers felt that this was a very good investment.

Gastrointestinal Surgery
(Magnus Sundbom)

General assessment of the unit
The presentation was given mainly on upper GI surgery. The previous professor retired this month. The department is currently trying to recruit a successor.


Quality of research
Acceptable standard/Insufficient.

Research environment and infrastructure
Too few bariatric operations to be a national referral center. Long-standing interest in biliary surgery research. Future liver surgery possibilities are unclear since the liver transplantation program has been stopped.

Networks and collaborations
Possibility to expand – now lack of OR. Networks are planned, with adequate national programs. GI physiology.

Opportunities for renewal and emerging science
Biobank, quality of life studies. Proteonomics. The department should use its
experience and long-standing interest in bariatric surgery to form a potent network with other centers to form a meaningful basis for scientific work.

Effect of the KoF07-evaluation
This program was not invited to be evaluated in 2007.

Colorectal Surgery
(Lars Påhlman)

General assessment of the unit
This is an excellent unit which has delivered trials which have changed clinical practice globally, notably the collaboration on preoperative radiotherapy. They have maintained momentum across a range of clinically relevant conditions, with great efficiency.

At present a large number of randomised multi-center clinical trials are performed in colorectal cancer, mainly nationally but also internationally. Selected topics are chemotherapy, palliation, carcinomatosis and also the use of different surgical techniques including laparoscopic surgery and new staplers. Randomised trials are also ongoing in less glorious but common and cumbersome diseases like functional disorders (constipation) as well as proctology, i.e. incontinence, haemorrhoids and fistulas.

Quality of research
Top-quality.

Research environment and infrastructure
The research environment seems vulnerable since it is run with a minimum of personnel – their main strength is on clinical trials but they seem remote and disconnected from other trials offices in the area.

Networks and collaboration
They have developed a very strong collaborative network in Sweden and good relationships especially with Dutch centres. This could be made stronger with more international collaboration.

Opportunities for renewal and emerging science
There is a worry about succession planning as much of the success of this unit depends on the leadership of Påhlman and collaboration with Bengt Glimelius, both of whom are due to retire. It is not clear how the university will deal with this.

Actions for successful development
We would suggest that the university undertakes review of clinical trials activ-
ity across the School and seeks to find a model to support and better integrate small, independent Trials Offices.

**Effects of the KoF07-evaluation**
None.

**Vascular Surgery**  
(Martin Björck, Anders Wanhainen)

**General assessment of the unit**
This is the largest research-group in Sweden within the field of vascular surgery, with a high publication output. Most PhD students and postdocs are working outside of Uppsala, creating a network for multicentre studies. The main focus is clinical research on abdominal aortic aneurysm (AAA), including endovascular procedures, epidemiology, etiology, screening for AAA, and therapy.

The department is well equipped with resources, personnel and research students with a very strong tradition of vascular surgery research. Oldest vascular register in the world with 180,000 procedures. With modern equipment in imaging. Largest and most active group in Sweden with PhD students in the department and other hospitals. The group is well funded, mainly by external sources. Most research activities were initiated by the previous professor.

**Quality of research**
Internationally high standard. Research in AAA is excellent, ranging from clinical assessments as the role of inflammation, infection to operative techniques and studies detection of factors for growth and prevention of growth. The work has led to the proposal of new standards of care with ultrasound screening for AAA in the elderly population.

**Networks and collaborations**
Active collaboration with groups in basic research. It is a national reference center with very good international connections.

**Opportunities for renewal and emerging science**
Excellent possibilities to train surgeons and researchers. Registers in elderly patient cohorts should be maintained.

**Actions for further development**
The division is clearly on the right track to successful clinical and research activity. The next step, according to the group, is to prevent the development of AAA once recognized by the screening. The group should be encouraged to invest more in basic and translational research on vascular biology.
Effects of the KoF07-evaluation
The presenters commented that the high ranking did not change much since no extra funding was given.

Transplantation
(Gunnar Tufveson)

General assessment of the unit
Liver transplantation activity in Uppsala has been stopped by the Swedish authorities. Present clinical activity encounters kidney transplantation, pancreas transplantation and pancreas islet transplantation, the last two in DM1 patients. All three programs are rather small. Collaborations exist in particular with Professor O. Korsgren, an immunologist head of the reference laboratory for pancreas islets in the Nordic countries. This has generated a dominance of publications on pancreas islets. Of the presented papers first author publications of the transplant surgeons represent less than 25%.

Quality of research
Internationally recognized standard/Acceptable standard. Research in pancreas islets is internationally recognized.

Research environment and infrastructure
The transplant research small animal lab is moved to Professor Korsgren’s lab. Pig lab is run with anesthesiologists. Co-operations with small biotech companies are ongoing.

Networks and collaborations
The studies and the major grants depend very much on the collaborators – departments/units of immunology, nephrology, diabetes, pathology, radiology, neurosurgery and genetics. Main research collaborators described besides Korsgren are B. Nilsson and R. Larsson.

Opportunities for renewal and emerging science
Seems important to explore the selected new and research area. The consequences of brain death damage and re-inventions in the organ/islet preservation area could be useful with the use of new methods.

Actions for successful development
The imminent question is: Is there a critical mass of clinical activity today? This has to be discussed in the hospital. The present head, who has been an immense origin of research ideas, will soon retire. It is decisive to select a successor with good research potential.
Effects of the KoF07-evaluation
The lab was considered too small. The experimental lab has now moved and permits better possibilities for research. The organ transplant research activity has decreased.

Oral and Maxillofacial Surgery
(Jan Hirsch)

General assessment of the unit
Important clinical development work. Small clinic that has risen from a very small activity to a very respectable group. The group has recently merged with the division of Plastic Surgery. Oral cancerous lesions are studied, shaping bone transplants by virtual visualization, testing new implants, etc. The work is admirable but strongly based on computerized modelling of facial bones and implants, which is more a medical art and work of engineering than a scientific contribution.

Quality of research
Acceptable standard.

Research environment and infrastructure
Mostly clinical development, collaboration with an external company that tailors implants.

Networks and collaborations
Could be improved. Collaboration is primarily with a company that manufactures implants.

Opportunities for renewal and emerging science
Create a scientific program that allows better evaluations of new developments. The new leadership to be at this clinic should be used to reorganize the treatment of oral cancers.

Actions for successful development
Young PhD students have been educated and can develop the scientific work when the former head retires.

Thoracic Surgery Group
(Elisabeth Ståhle)

General assessment of the unit
The Thoracic Surgery Group has very few researchers and very little academic
The academic persons seem to have major difficulties in recruiting routine surgeons to do research. A strategy to overcome these obstacles did not become apparent.

**Quality of research**
Insufficient.

**Research environment and infrastructure**
The division performs only about 800 routine operations yearly. Thereby, the clinical material is rather small for any clinical studies to be performed.

The professor has an interest in epidemiology, especially in lung cancer epidemiology. In that respect the small number of own patients does not support the ambitions. Another field of interest is artificial heart and lung support. Again, in this respect the small number of patients does not support the scientific interest.

**Networks and collaborations**
The group has some national collaboration, but no major international collaboration.

**Opportunities for renewal and emerging science**
Without being able to recruit PhD students and without being able to involve the clinicians in research the possibilities of improving is limited.

**Actions for successful development**
The group should focus on only a limited number of topics. It should seek for collaboration with cardiac anesthesiologists and basic researchers.

**Effects of the KoF07-evaluation**
There has been little development since 2007.

**Plastic Surgery and Burn Care**
(Bengt Gerdin)

**General assessment of the unit**
According to the presenter, the department has “a long history of no research”. More recently, the development of two major research areas can be recognized, the Uppsala Burn Research Program and the Epithelium-Connective Tissue Interface Program. The research quality seems to improve, since one PhD student per year has passed his/her thesis since 2008. The key topics are the stress response to severe burns, and biological markers of burn severity (e.g., chromogranin).
Quality of research
Acceptable standard.

Research environment and infrastructure
There are too few research positions. Integration with maxillofacial surgery may increase opportunities for a positive development. Burn research of stress response with neuroscience, psychiatry. The Center was recently nominated to become one out of two National Special Medical Care Centers for Advanced Cranio-Facial Surgery and for Burn Injuries, respectively.

Networks and collaborations
Local collaborations, much less with national or international groups.

Actions for successful development
Important to secure the progress of the started projects. The merger and collaboration has increased and gives obvious potential. The programs of the group are primarily patient based. Therefore, their success is heavily depending on an adequate number of patients and size of the scientifically active staff.

Effects of the KoF07-evaluation
In 2007 little academic activity was seen. In 2011 a good start was noted and should be further supported.

Orthopaedics (Biomaterials)
(Sune Larsson)

General assessment of the unit
This is a group at the international high level. Research directions include bone substitutes and bone materials. Experimental work has continued successfully and received international recognition. In spite of this, publications in top journals seem to be fewer than expected. Good external funding. Sune Larsson has been elected as one of the main research innovators in the university.

Quality of research
Top-quality/Internationally high standard.

Research environment and infrastructure
New EU grant coordinated from Uppsala. The biomaterial group has a fruitful collaboration with the local Ångström laboratory.

Networks and collaborations
Important local collaborations in Uppsala, as well as nationally and abroad.
Opportunities for renewal and emerging science
Research on bone substitutes continues strongly. The ultimate test is still lacking since clinical studies have not yet been performed, but the researchers estimated to start after few years. Commercial opportunities could emerge.

Actions for successful development
Need for better facilities. Future testing of experimental findings in humans remains to be seen, but the prospects seem promising.

Orthopaedics, Epidemiology
(Karl Michaëlsson)

General assessment of the unit
This is a group of recognized international standard. Epidemiology focusing on the osteoporotic fractures. Own collection of DEXA for later follow-up. Fracture registry work, comparison with dietary self-assessments. Prominent publications, in particular about diet and fractures.

Quality of research
Internationally high standard.

Research environment and infrastructure
Good collaboration with pertinent registries.

Networks and collaborations
Epidemiological unit collaborates well with national groups, such as the twin registry in Stockholm, using the benefit offered by the Swedish registries.

Opportunities for renewal and emerging science
The main study relies on national registries, which already for a long time have been strong in the Scandinavian countries, particularly in Sweden. In order to further improve the level of research, the group is encouraged to direct its interest from registry studies to more innovative approaches. We would look forward to more robust intervention studies, preferably RCTs, but these must naturally run over a long period of time.

Actions for successful development
See above.

Effects of the KoF07-evaluation
A junior research position.
Otho-, Rhino-, Laryngology
(Matti Anniko, Helge Rask-Andersen)

General assessment of the unit
It was somewhat difficult to interpret the research of this department, since both professors were abroad and they had no stands in, but the activity of the department was presented by a collaborator from the Section of Biomedical Radiation Science (Marika Nestor).

Quality of research
Overall rating is not given, but could range from internationally high standard to acceptable standard. The quality of the research of Professor Helge Rask-Andersen is internationally recognized. The international position of Professor Matti Anniko’s research was more difficult for the reviewers to interpret. The collaboration with the Section of Biomedical Radiation Science seems promising, but the results are still preliminary.

Research environment and infrastructure
Professor Rask-Andersen has a large group, including both a clinical research group and an experimental research group. The clinic apparently attracts patients from a larger area, especially patients with inner ear problems.

Networks and collaborations
The group has a large network of international collaboration with groups from Europe and the U.S.

Opportunities for renewal and emerging science
The group has promising plans for the future. Particularly the collaboration with basic research might lead to new therapeutic options.

Actions for successful development
It is difficult to make recommendations given the absence of the senior investigators, despite the very good presentations made by representative of BRS.

Forensic Medicine
(Ingemar Thiblin)

General assessment of the unit
The research at the Division of Forensic Medicine essentially follows four lines; consequences of abuse of anabolic androgenic steroids (AAS), injury epidemiology/injury interpretation, sudden cardiac death, and risk factors for sudden death during police apprehension. The research is performed in collaboration with Uppsala Clinical Research Center (UCR) the Doping Control Laboratory...
at the Karolinska University Hospital in Huddinge, and KTH Royal Institute of Technology.

This research is split into three main fields: (i) computerized injury stimulation, (ii) injury data base with a mathematical model for violent crime, and (iii) anabolic steroids and its association with crime. The use of anabolic steroids influence size of the heart and testis.

Quality of research
Acceptable standard/Insufficient.

Research environment and infrastructure
Small group, weak infrastructure.

Networks and collaborations
Networking could be expanded.

Opportunities for renewal and emerging science
The field has a great potential for further research in the present fields.

Actions for successful development
The research is attracting some interest but activities should be revised. Some of this research is important although not very innovative. In relation to the limited resources and few people in the group it would be wise to restrict the research to one or two main areas.

Effects of the KoF07-evaluation
None known.

Health Care (Nursing)
(Camilla Fröjd)

General assessment of the unit
Nursing research is currently developing with nurse researchers and PhD students working as members of the department’s different research groups. Nursing research concerns a diversity of topics such as improving safety in intensive care, neurological assessment after induced hypothermia after cardiac arrest and nutrition in surgery. They have 8 nurses presently being PhD students studying: (i) Surgery, (ii) Anaesthesia, (iii) Orthopedics, and (iv) Intensive care. Combining the medical research perspective with the nursing research is an important research direction that is likely to generate an extended knowledge on patients’ health and patient care.
Quality of research
Insufficient. Research is not focused. There are no clear hypotheses.

Research environment and infrastructure
There is support in the environment and enthusiasm for this research.

Networks and collaborations
Networks should be built.

Opportunities for renewal and emerging science
There are potential possibilities.

Actions for successful development
A new focus should be selected and research competent leaders should be recruited. So far this research is insufficient in an academic environment.

Networks could be established both at a national and international level. The research is up to now to scattered and should be more focused. More basic questions of nursing could be penetrated. The group would benefit recruiting one or two persons with experienced researchers in order to establish on an national and international level.

Effects of the KoF07-evaluation
Not evaluated.

Urology
(Per-Uno Malmström, Anna Bill-Axelsson)

General assessment of the unit

A long tradition of Scandinavian multi-center studies in prostate cancer and bladder cancer with Uppsala often in a leading role. Research relies partly on accurate register-data. Outstanding studies, which to the same extent can be performed in very few centers in the world.

Quality of research
Prostate cancer is top-quality. Bladder cancer is internationally high standard.

Research environment and infrastructure
Many collaborations with epidemiologists and collectors of biomaterial. Registry responsibilities.
Networks and collaborations
Many, both with epidemiologists and bladder cancer researchers.

Opportunities for renewal and emerging science
The division runs very well designed and clinically important randomized studies in prostate cancer for which they currently earn world-wide recognition. The bladder cancer studies are very well organized but suffer from a relative lack thoughtful approaches to make progress.

Department of Radiology, Oncology and Radiation Sciences (ROS)

General comment
Since 2007 the Clinical Immunology has moved to another department, in line with the suggestion in the KoF07 evaluation. Therefore a relatively small department consisting of the Radiology, Oncology and Biomedical Radiation Science sections remains. On the other hand, the Nuclear Medicine group recently came from Clinical Physiology and is now embedded in the Radiology group.

The committee wonders if the size of the department meets enough critical mass for an independent continuation or if further mergers should be considered. It appears to us that the cancer research community is scattered in different departments and therefore could benefit from a mechanism to integrate it more fully.

Section of Oncology

U-CAN
(Bengt Glimelius)

General assessment of the unit
This new biobanking U-CAN project is new, centrally funded and is currently in the start up phase. We have no doubt that this will be effectively led, quality assured and will integrate with current clinical activity, however some questions were raised about the intellectual underpinning of the project.

Quality of research
Internationally high standard.

Research environment and infrastructure
The concept of an integrated biobank and database for cancer patients of the
Universities of Umeå and Uppsala is a great plan and should be fully supported. This concept should also be used to develop an integrated, multidisciplinary approach for patient care pathways and clinical trials across the University Hospital, an area with room for improvement.

Networks and collaborations
There is good potential of the U-CAN for international co-operations that are already existing, but the networks need to be further developed.

Opportunities for renewal and emerging science
The U-CAN itself represents a new, emerging opportunity that deserves full support of the university. Although we understand the generic basis for tissue banking we would like to have a better sense of what sort of hypotheses could be feasibly approached and what technology platforms exist in Uppsala that confers a competitive advantage. At the moment it appears that it is sufficient to construct the biorepository without really considering these issues.

Actions for successful development
The U-CAN will be successful, if its management will be able to rapidly integrate some of the stronger disease programs of the campus into this biobank allowing to exploit their annotated sample repositories.

Effects of the KoF07-evaluation
None, because the U-CAN represents a new activity that started after 2007.

Malignant Lymphoma
(Gunilla Enblad)

General assessment of the unit
The presentation contained a vast array of diverse projects in different areas of malignant hematology, including Hodgkin’s disease (including EBV), diffuse large cell lymphoma, studies on the microenvironment, post-transplant lymphoma, relation of autoimmune disease and lymphoma, and some more. The group shows an active participation in many trials in the Nordic lymphoma group or similar activities, but rarely takes the lead.

The group is more committed to the delivery of good clinical care within multicenter trials activated elsewhere than to conduct original research. Most of the group’s publications are from these activities with middle author positions of the Uppsala group.

Quality of research
Acceptable.
Research environment and infrastructure
According to the presenter, the group lacks personnel and/or sufficient time to develop new concepts.

Networks and collaborations
Very good co-operations in the Scandinavian multicenter study groups.

Opportunities for renewal and emerging science
Here, the U-CAN activities might help to inspire new research activities.

Actions for successful development
The hospital or university might examine whether a limited investment in new personnel might help to launch a more original research activity of this group.

Effects of the KoF07-evaluation
There was no effect becoming apparent during the 2011 evaluation.

Colorectal Cancer
(Bengt Glimelius)

General assessment of the unit
This is an excellent and productive team, initiating a range of ‘own account’ projects and also providing patients for other well designed clinical trials with international groups. It will integrate with the U-CAN project in time, but thought must be given to future hypothesis testing.

Quality of research
Internationally high standard.

Research environment and infrastructure
This is a good research environment and is clearly an academically active unit.

Networks and collaborations
They have excellent networks extending through Sweden, Scandinavia and wider international community.

Opportunities for renewal and emerging science
This is a very competitive area and there was nothing that differentiated the Uppsala group from other teams working in this field. Clearly, the U-CAN project can help, but only if some sharp new hypotheses are developed. This could be an area that would benefit from further international collaboration with established biomarker groups.
Actions for successful development
Again, succession planning is critical for this group, given the outstanding leadership provided by Glimelius who will retire within two years. We also would like to see this project being linked to mainstream trials offices and existing platform technologies. There was also a plea from one of the clinicians for more ‘reserved’ research time for busy cancer clinicians.

General heightening of awareness of the value and quality of clinical research in Uppsala.

Effects of the KoF07-evaluation
None.

Short snap-shots from other trials
(Peter Nygren, Simon Ekman, Gustav Ullenhag, Henrik Lindman)

General assessment
Four young researchers, who gave short presentations showed activities in drug discovery and profiling, development of an IGF-1R inhibitor for colorectal carcinoma, anti-HER2 receptor radiolabelled antibody fragments (“Affibodies”) for the treatment of breast cancer.

These programs hold some potential for future excellence, since they were mostly presented and conducted by younger investigators. For example, the development of an IGF1-R inhibitor in cooperation with the group of C. Heldin for the treatment of colorectal cancer is such a cooperation of potential. However, it needs to be proven whether these activities will lead to internationally visible breakthroughs. The publication records of the investigators do not allow a more positive evaluation.

Quality of research
Internationally recognized standard/Acceptable standard.

Research environment and infrastructure
The infrastructure for this type of research seems very good, but we would caution a little against a stand alone drug discovery/development programme as this seemed a little naive at first sight.

Networks and collaborations
Good co-operations on a national level.

Opportunities for renewal and emerging science
There could be potential for developing a phase 1 trials unit, but this will require careful planning and investment to establish a sustainable presence in this competitive field.
Actions for successful development
These small groups will need support at the level of the institute(s). The department needs to ensure that these groups continue to improve.

Effects of the KoF07-evaluation
There was no effect becoming apparent during the 2011 evaluation.

Clinical Experimenal Research
(Ingela Turesson)

General assessment of the unit
The relatively small group tries to assess markers of the DNA-damage response (DDR) in patients undergoing radiotherapy. As a consequence this work remains mostly descriptive.

Quality of research
Acceptable standard/Insufficient. The program has not produced publications of international value or recognition so far. Moreover, the current strategy is not fully convincing to become much more productive in the near future.

Research environment and infrastructure
Good research environment as shown by the quality of the clinical studies which require complex biopsy schedules, etc. The infrastructure for this type of research seems very good. Good integration with the clinical teams.

Networks and collaborations
The group has some co-operations at the national level. This seems to be focussed on in-house clinical activity, however the biopsy material is unique and could be the source of valuable collaboration with other groups.

Opportunities for renewal and emerging science
Any development towards a more mechanism-based or hypothesis-driven research should be highly encouraged.

The real doubt that we have with this research is the potential to link the acute changes in the kinetics of these radiation damage biomarkers with late effects – the main purpose of the study. The investigator herself admitted that modern radiotherapy techniques do not induce the same degree of late damage, therefore the chances of establishing a correlation between early and late effects seems small. She may able be to identify surrogate markers but it was not clear how this would be accomplished.

Actions for successful development
A merger or stronger cooperation with the research group on DDR (Bo Sten-
erlöw) should be discussed. Define series of surrogate markers for late effects of irradiation.

Effects of the KoF07-evaluation
There was no effect becoming apparent during the 2011 evaluation.

Caring Science, U-CARE
(Birgitta Johansson)

General assessment of the unit
The presentation of program have convinced the reviewers by its attempt to assess the value of psychosocial care by rigid, scientific methods. This included a randomized trial to assess two methods of psychosocial interventions (Stepped versus Standard Care) in breast, prostate and colorectal cancer. This is a very important and convincing approach.

The program has little publications so far but this might improve and should discourage the university to support it.

Quality of research
A little early to judge, but has potential of Internationally recognized standard/Acceptable standard.

Research environment and infrastructure
This is an excellent multidisciplinary environment, in particular for psychosocial research. The infrastructure for this project seems very good.

Networks and collaborations
Regional networks are in place and a the group has excellent co-operations with the leaders at a national level (von Essen).

Opportunities for renewal and emerging science
The program should be linked to all cancer care activities at the campus, including the nursing research based in the Department of Surgical Sciences.

The main outcome would be in delivery of this interesting randomised study and the group are to be congratulated with taking this formal approach, so often missing in this whole field.

Actions for successful development
Continued support by the university is encouraged in this emerging field that needs independent evaluation by randomized trials.

Effects of the KoF07-evaluation
There was no effect becoming apparent during the 2011 evaluation.
Radiophysics
(Anders Montelius, Anders Ahnesjö)

*General assessment of the unit*
This is an excellent multidisciplinary environment.

*Quality of research*
Internationally recognized standard/Acceptable standard.

*Research environment and infrastructure*
Good infrastructure as part of a an academically active Oncology Department.

*Networks and collaborations*
No sense from presentations that it worked within or supported a network.

*Opportunities for renewal and emerging science*
The list of projects presented was large and rather generic. They may do better, given the size of the division to focus on a smaller number of projects in which they can be truly competitive. An interesting example of this was given in which a new software algorithm had been developed which improved the speed and fidelity of radiotherapy field planning. It will be essential to generate sufficient expertise in the physics of proton beam modelling as this new facility will be sited in Uppsala.

*Actions for successful development*
This modelling and software development group is worth supporting, perhaps with more resources.

*Effects of the KoF07-evaluation*
None.

**Section of Biomedical Radiation Sciences**

Different ratings were given to the subgroups that presented, resulting in an overall rating ranging from internationally high standard to acceptable good work, attracting national interest or has great relevance. See below for more detailed information.

*General assessment of the unit*
The committee listened to a number of short presentations on the different research lines in this relatively small unit; senior researchers show to the opinion of the panel a too strong desire to become group leaders of their own, often small, research group.
The group as a whole has produced innovative tumor-targeting molecules and vectors of different size, labeled in several ways with radionuclides for tumor imaging.

Some group members hold patents, there is international recognition in the field for part of the group, several papers have been published in highly ranked journals in the field and in general cancer journals and biochemical journals.

Quality of research
The ratings for the subunits were as follows:

Bo Stenerlöw: DNA-damage repair research
Quality rating: Acceptable standard. Good and attractive work, but it has not yet produced a high number of publications attracting international recognition. Stronger collaboration with the Oncology subgroup working with DNA damage and other basic researchers in this competitive area is encouraged.

Marika Nestor: Head and neck tumour targeting
Quality rating: Internationally recognized standard/Acceptable standard. A small number of prominent positions on highly ranked publications. Supervision and support from the department to bring this research into the clinic is encouraged by the panel.

Vladimir Tolmachev and Anna Orlova: Radionuclide Targeting
Quality rating for both: Internationally high standard. Leading very productive and successful research lines on Affibody development and evaluation, resulting in highly ranked publications. Received two prestigious personal grants.

Jörgen Carlsson: Breast cancer metastases
Will retire in due time and recently made a move in his career and stepped back from his previous preclinical research lines to focus on a first-in-woman evaluation of a HER2-targeting Affibody molecules. This study as yet included only six patients, and will not be rated now.

Lars Gedda: Targeting EGFR Family
Quality rating: Internationally recognized standard. Two-step targeting and liposome work, resulted in several patents. Good publications, but a small number of prominent positions on recent publications only.

Karl Andersson: Protein Interaction Analysis
Quality rating: Acceptable standard. Development of tools for protein-protein interaction based on binding of a radioligand to targets over expressed on tissue or cultured cells. Several applications of these tools have been described in publications of relatively low impact.

Networks and collaborations
Several collaborative networks have been set up with industry and as well as with research groups in Europe and USA.
Research environment and infrastructure
In the framework of clinically oriented units within the department ROS, this group concentrates on preclinical research that should be driven by clinical needs and collaborations with clinical groups were initiated. There is a good infrastructure for development and evaluation of the new radiotracers and different state-of-the-art techniques to evaluate the novel tracers that have been applied. The group may however be vulnerable in their relatively stand-alone position in the department. The panel recommends even stronger relationships with clinical departments.

Actions for successful development
In general, it is a problem that the group has too few permanent positions; most researchers work on their own (external) money. The committee is anxious about the continuation of the subgroups when the external personal funding of several senior researchers will end, so finding ways to maintain the momentum is critical for this group. The critical mass of the different subgroups is too small, and in addition, the subgroups follow many leads. The group as a whole would improve when concentrating on their most promising research lines in collaboration with clinical groups that can bring compounds of value into the clinic.

Opportunities for renewal and emerging science
Further bridging the gap between preclinical and clinical research is essential. Integration between the group of Nuclear Medicine (clinical studies) and the Section of Biomedical Radiation Sciences (preclinical developments) is ongoing and should be pushed further, to improve clinical follow-up and embedding of the preclinical work.

Effects of the KoF07-evaluation
None, as reported.

Section of Radiology
Different ratings were given to the subgroups that presented, resulting in an overall rating ranging from top-quality to acceptable standard work. See below for more detailed information.

General assessment of the unit
The radiological research includes technical improvement and assessment of all imaging methods, mainly ultrasound, computed tomography, magnetic resonance imaging and methods in nuclear medicine including positron emission tomography.

There have been many changes in the group since KoF07, especially because
of the merger of the Nuclear Medicine group (coming from Clinical Physiology) with Radiology. The group as a whole presented a very diverse array of activities, this panel felt there is no clear research strategy for the Radiology group, probably because by this group many imaging methods are being applied in different organ systems.

Many of the activities of the department are performed in collaboration with other departments, in which the Radiology groups provides the imaging research. This could lead to confusion between hypothesis driven research and service provision.

There is international recognition in the field for several group members, the group holds patents and has published many papers in highly ranked international journals.

_Parity of research_
Ratings in more detail for some of the subgroups:

**Håkan Ahlström and Lars Johansson: Cardiovascular and Oncological MRI and PET**
Quality rating: Top-quality.

**Jens Sörensen: PET**
Sörensen started in January 2011, so he is new in this group. He is enthusiastically looking for solid research lines to concentrate on, also in close connection to the BRS groups. Not yet rated, but there are many opportunities for research of high potential.

**Pär Gerwins: Angiogenesis (loop)**

**Raili Raininko/Elna-Maria Larsson (Neuroradiology), Rickard Nyman (Interventional Radiology), Anders Magnusson (Uroradiology), Per Liss (Contrast Media), and Mari Hänni (Musculoskeletal Radiology)**
With their respective groups they presented very good clinical work, that was however not always recognized by the panel as hypothesis driven research. Many publications resulted from the activities of these groups. Their quality ratings did not exceed Acceptable standard.

Networks and collaborations
Many collaborations have been set up with industry as well as with research groups in Europe and the USA.

Research environment and infrastructure
The infrastructure is very good, with a complete array of clinical imaging tech-
niques (CT, MRI, PET, and SPECT) available for research purposes. The group applied for a fully integrated PET-MRI platform for functional molecular imaging studies and has good expectation to obtain it in 2011.

**Actions for successful development**

The subgroups follow many different leads. According to the panel the group as a whole could even improve when being guided to a stronger focus on their most successful or promising research lines.

A platform for simultaneous PET-MRI imaging would be a great asset. It could give the group a world-leading research position and might attract many (inter)national collaborations.

**Opportunities for renewal and emerging science**

Considering the recently changed situation because of, e.g., the embedding of nuclear medicine techniques in this group, the momentum to change focus is there. The desired PET-MRI platform could help bridging the different projects to high quality and innovative research of common interest to all subgroups.

**Effects of the KoF07-evaluation**

The department received a postdoc for three years and a platform for automated image analysis.
Panel 23

Scope of the panel’s evaluation:
Department of Neuroscience
Department of Public Health and Caring Sciences, Geriatrics

General assessment of neuroscience at Uppsala University

Current research
The Department of Public Health and Caring Sciences, Geriatrics focuses on dementia research. The research covers molecular studies of dementia, translational studies to develop novel drugs, and clinical and epidemiological studies of neurodegenerative diseases. The unit has obvious potential for breakthroughs in diagnosis and treatment of neurodegenerative disorders. The research is well focused with clear synergies between the different groups of the unit. The research profile of the unit makes a good fit with that of the Department of Neuroscience, and it could be argued that it should be linked more closely to the activities of the Department of Neuroscience or could be incorporated into the department in the future. A major thrust of the unit lies in the hypothesis that oligomeric forms of amyloid beta play a key role in the pathogenesis of Alzheimer’s disease. Following the KoF07-evaluation, the unit has been able to develop a specific antibody against the oligomeric amyloid beta; this antibody has been promising in preclinical proof-of-concept studies in animal models and is now in phase 1 clinical studies to treat Alzheimer’s disease.

The Department of Neuroscience was formed in 1998 by fusing 10 basic science and clinical departments plus a neuroanatomy group from the Department of Anatomy. In 2002–2005 the Department of Neuroscience grew further following the inclusion of a part of the Department of Physiology, and groups working in comparative medicine, logopaedics and genetics, and development. In a recent effort to concentrate the department’s activities, the unit for Physiotherapy and the unit for Speech Physiology and Pathology were moved in 2010 to the Biomedical Center from their earlier separate locations.

The process of incorporating the previously independent departments in the Department of Neuroscience has created a situation of extreme diversity in this department. This diversity can be seen as a potential strength to create multidisciplinary constellations extending from very basic molecular/cellular studies to clinical research. The panel recognizes that this potential has in some units been realized since the KoF07-evaluation. As a consequence, the department has identified four major thematic areas where this multidisciplinary potential is exploited: (i) Neuronal networks and plasticity, (ii) Neural basis of body weight control, (iii) Neurotrauma, and (iv) Genetics and clinical neuroscience. These thematic areas form the basis for strategic development in the Department of Neuroscience.
Neuroscience and have created a research profile that highlights its wide scope. For example, studies on neural basis of body weight control or on brain injury are simply not pursued at the same level of quality or of comparable multidisciplinary effort in any other Swedish university. From an international perspective, the thematic areas of the department cover major research initiatives that have led to publications in top-tier general and neuroscience-oriented journals.

In general, the panel has given higher scores than were given in the KoF07-evaluation and identified several research units/programmes where research is of top-quality or of internationally high standard. The panel recognizes that the research staff of the department is quite international: within the research staff of 148 persons that includes the PIs, the postdoctoral researchers and the PhD students, 57 persons are currently foreigners.

The following units/research programmes (in alphabetical order) are rated to be of top-quality international standard:
- Developmental genetics (chaired by Kullander)
- Functional pharmacology (chaired by Schiöth)
- Geriatrics (chaired by Lannfelt).

The following units/research programmes (in alphabetical order) are rated to be of internationally high standard:
- Clinical neurophysiology (chaired by Larsson)
- Neurotrauma (chaired by Enblad, Hillered and Ebendal)
- Pharmacology (chaired by Larhammar).

In addition, two smaller units (in alphabetical order) were rated to be of internationally high standard:
- Molecular physiology and pharmacology (chaired by Birnir)
- Retinal cell biology (chaired by Hallböök).

**Actions for further development**
The panel of KoF07-evaluation recommended the identification of clear thematic research areas extending from basic neuroscience research to clinically oriented studies. The current panel recognizes the response to this recommendation as four major thematic research areas have now been identified that profile the department’s research. The panel strongly encourages the department to continue down this line, to strengthen current research in the selected areas and to consider their needs in future recruitment of research staff.

Despite this favourable development that has certainly improved quality and renewed the department’s research on the selected thematic areas, some research areas still exist that have not found any connection to other, likely synergistic, areas of the department. For example, one would expect that Psychiatry would find excellent opportunities to exploit the departmental expertise in basic research of feeding behavior, which is highly relevant in the understanding of the pathogenesis of eating disorders and obesity.
A considerable proportion of resource allocation to the groups of the department is based on teaching activities that are quite unevenly distributed. Some PIs use half or even more of their time for teaching whereas some do not teach much at all. The department leadership is currently reconsidering distribution of teaching. A strategy where all groups participate in teaching to some extent should be possible in the department. The strategy where resource allocation to the groups depends on teaching activities should be also reconsidered, and more emphasis should be given to research accomplishments and participation in major thematic research areas.

The department leadership is encouraged to continue actions that would unleash the synergistic potential of the diverse research themes. To this end, common seminars that would attract researchers from all units would be useful. Retreats in which all personnel participate should be also be used to boost a better alliance between the different units. Time for research is quite limited in many clinical departments, with only 20–30% of working hours being available in some units. All possible action should be taken to improve the situation for the PIs whose projects appear promising. Research professorships with little clinical duties may be one possibility to increase scientific impact of the units. One good model is the neurotrauma consortium that has managed to create highly active research extending from bench to bedside.

Internal decision-making is quite challenging in a department having many diverse research lines. The department could consider having an international SAB that could be helpful for example in deciding the nature of the major research lines of the department and their resources, and in finding and selecting talented PIs for the groups.

Department of Neuroscience

Physiotherapy

General assessment of the unit
This is a relatively new department that is still trying to find its place in the Department of Neuroscience. Although it has many strands of research in progress its main focus is the initiation of practical programmes to change health behaviour and this is to be commended as a good general strategy. The teams headed by P. Åsenlöf, K. Hellström and M. Emtner are all involved in this and their emphasis on physical training and activity in patients with a range of diseases where obesity and muscle disuse are frequent is likely to lead to valuable results if followed through assiduously. This could be usefully expanded to all parts of medical illness and psychiatry and there are many possibilities of in-
creased collaboration. The move to BMC seems to have improved performance and the research environment has been stimulating. Good randomised trials are being carried out but these have mainly been initiated with external help and there are some problems (e.g., low follow-up rates in longer studies). There are several national collaborative studies in process of development and execution and are going well.

**Quality of research**
The quality of work has certainly improved since the last assessment in 2007 but remains of acceptable standard only as the group has yet to make an international impact.

**Research environment and infrastructure**
The research environment is positive and enjoyed by the staff and the introduction of two new postdocs and 10 PhD students is encouraging. The level of collaboration has increased and as the group improves in confidence it could develop further.

**Networks and collaborations**
There are good networks nationally, but at present not internationally but there are few potential collaborators identified outside the country at present.

**Opportunities for renewal and emerging science**
The good PhD take-up suggests that new staff may be generated from within the group. However, they are likely to need more help in developing the skills to carry out good randomised controlled trials from a health service perspective and in particular to develop good costing procedures to examine the cost-effectiveness of their interventions.

**Actions for successful development**
A new associate professor with more research experience would be desirable.

**Effects of the KoF07-evaluation**
At the last evaluation it was uncertain where this group might best be placed. However, the move to the BMC has been positive and has improved their collective self-esteem.

**Speech and Language Pathology**

**General assessment of the unit**
This is a new unit within neuroscience at Uppsala University and its research focus is the neuroscientific aspects of speech. Four areas are being studied by the group; the neurobiology of speech fluency, cognitive-communication in
dementia, the neural basis of dyslexia, and language development in children without speech. As much of the work of the unit is new it is difficult to evaluate the work of the unit and its outputs fully.

Quality of research
The research on speech fluency is new and Per Alm has only recently joined the group as a visiting staff member. There is interesting work planned on the neurocognitive and neurophysiological aspects of stuttering but both this and the work of Per Östberg on cognitive communication in dementia is too early to evaluate with any confidence. The work on the neural basis of dyslexia and language development in children without speech also has interest but needs to be integrated more closely with the rest of the work of the unit. At present the quality of the research as a whole is generally of acceptable standard.

Research environment and infrastructure
The group likes being in neuroscience and wants to integrate more with other groups in the department. The proposals to investigate the neurobiological mechanisms of normal speech production and stuttering, including the use of transcranial magnetic stimulation, is likely to need closer collaboration within the Department of Neuroscience.

Networks and collaborations
There are excellent international links with the U.S., Norway and Australia and with other units in Sweden, but very little in Uppsala to date. This is understandable as the unit is new.

Opportunities for renewal and emerging science
The new staff (Per Alm and Per Östberg) are likely to stimulate research activity, but their work does not currently meld well with that of existing staff. The potential for interventions in future could be considerable but currently the subject is low on the Swedish list of priorities for research and needs a champion to promulgate it.

Actions for successful development
This is a new research group whose work needs to be integrated more closely under new leadership. Dr Jennische has set up a good group but following her retirement a senior colleague is needed to synthesise the work of the group and move it forward to give the subject greater national prominence. The quality of PhD students is good and as the study of vocalisation is a growing theme in many areas of neuroscience there are opportunities for closed collaboration within neuroscience at Uppsala.

Effects of the KoF07-evaluation
No comparison as this is a new unit.
Pharmacology

General assessment of the unit
The unit is concerned with research in three different main areas: (i) Studies of neuropeptide Y receptors and peptides and their role in appetite regulation and feeding, (ii) Evolution of important neuronal and endocrine gene families in the vertebrates related to genes for peptides and G-protein coupled receptor, and (iii) A project aimed at resolving the origin and evolution of cone and rod vision in the vertebrates.

With regard to project (i) emphasis is placed on peptide–receptor interaction and signal transduction as well as on studying human genetic variation in connection with obesity. Additionally, the origin and evolution as well as functional specialization of the NPY system and its receptors and peptides are studied in detail. This will possibly facilitate development of new drugs which may be of therapeutic relevance for treatment of obesity.

Project (ii) may lead to a better understanding of how and when more specialized forms of receptors may have evolved. Similar studies are performed for other membrane associated proteins such as voltage-gated calcium channels.

The third project has provided evidence that color vision mediated by the cones arose before dim-light vision mediated by the rods. The zebrafish has been chosen as the model system because it has undergone additional gene duplication through the teleost-specific tetraploidization.

Quality of research
The research performed in this unit is good and is rated as of internationally high standard.

Research environment and infrastructure
The research environment with regard to personnel composition appears to be ideal and there is a very good local collaboration and interaction among the scientists. Thus, the infrastructure seems to be adequate.

Networks and collaborations
The networking and international collaboration is of high quality and it is clearly an important factor in the successful performance of the group.

Opportunities for renewal and emerging science
The group has clearly strong leadership but it is particularly positive to note that the younger group members play an important role in executing the research projects. The projects of the group represent cutting edge science and the ideas are clearly novel. The research projects are very likely to be successful.
Actions for successful development
The group seems to have taken the necessary steps which have led to improvement of the research strategy.

Effects of the KoF07-evaluation
The group was considered very efficient and successful at the KoF07-evaluation and it is still in this category.

Functional Pharmacology

General assessment of the unit
This research group is involved in studies aiming at identifying the molecular basis for obesity and how novel transporters and membrane trafficking proteins are important for obesity. In relation to this, studies of the molecular mechanisms involved in the initiation and termination of meals seem of particular interest. In addition, advanced bioinformatics are utilized to unravel the evolution of large gene families such as the G-protein coupled receptors and the solute carriers. The project on functional characterization of novel amino acid transporters appears to be of particular importance. The group has developed methodological expertise in generation of conditional knockouts, fMRI and immunohistochemistry.

Quality of research
The research output of this group is exceptional and in this evaluation is ranked in the category of top-quality.

Research environment and infrastructure
The research environment appears to be highly creative and the personnel composition of a professor and an associate professor in combination with a number of postdocs and PhD students has proven itself highly efficient in terms of being able to produce cutting edge scientific results. As a consequence, the productivity in terms of publications is very impressive.

Networks and collaborations
The quality of the networking and international collaboration is very good and the group has been successful in attracting highly qualified postdocs.

Opportunities for renewal and emerging science
The group has demonstrated great capacity for renewal and has reached a state in which high quality science is produced. It is clear that the junior faculty has played an important role in this context.
Actions for successful development
It is difficult to see how the quality can be improved significantly but it may be advisable to enlarge the senior faculty in order to maintain the very high standard of the research.

Effects of the KoF07-evaluation
The recommendations made in the KoF07 report were followed diligently and it is concluded that this action has probably played a role in the progress in improving the scientific quality of the research.

Other issues
There are no further relevant comments except to underline that the research project is highly relevant for society.

Ophthalmology and Retinal Biology

General assessment of the unit
This is a new thematic unit formed by four smaller subunits: pediatric ophthalmology, ophthalmic biophysics, retinal cell biology, and motion vision. This organization is a result at least partly of the recommendations from KoF07. The activities within the unit vary from development of visual perception in prematurely-born children, molecular development of the retina, radiation effects and surgery on cataracts, and motion vision in hoverflies (family Syrphidae) along with their computational models. In general the research is strong, the recruitment of students are generally good (however, see further below), and the new thematic unit may contribute to unexpected synergies in visual neuroscience in Uppsala.

Quality of research
The quality of research of this new thematic unit is varying between the subunits for natural reasons, but overall is definitely to be considered of internationally recognized standard with very good work. It should be noted that the subunit of retinal biology remains at an internationally high standard with collaborative projects at the world leading level.

Research environment and infrastructure
Overall, the research environment and infrastructure in the unit is good. As pointed out elsewhere, resources for PhD students within several subunits such as pediatric ophthalmology and motion vision could be improved, and common activities within this new unit, such as lectures, home page, and retreat, could be considered for additional synergies and possible new constellations for grant application.
Networks and collaborations
Overall, the unit and subunits have excellent networks and collaborations locally, nationally and internationally. Just the last years, these collaborations and networking have resulted in publications in Nature, JAMA, PLoS Genetics, Current Biology and other top journals. Between the subunits, there is less collaboration due to the rather disparate research focus. Collaborations should probably come from bottom-up, but a seminar series in visual neuroscience with general interest for several subunits may be considered.

Opportunities for renewal and emerging science
The development of the new thematic unit is generally promising overall, and has also previously been recognized in the retinal cell biology group. It is at this moment especially rewarding to note the recruitment of a new assistant professor with research council funding with an exciting research plan, and it is strongly suggested that this new subunit gets the best possible support in infrastructure, visibility, and resources to establish the new research line.

It is however a concern how the subunit in ophthalmic biophysics will develop. Several irregularities were noted in the report and presentation of this subunit. For example, although funding from the research council (VR) was listed in the presentation and report for 2010, there are no records of such project funding in the VR database, the last year of funding was 2009. Further, although the subunit has noted Uppsala as its main research affiliation already in 2007, the subunit “tries to keep” funding for PhD students from Karolinska Institutet for 2010–11. Such unclear information makes it very hard to deliver an adequate evaluation and full discussion of the opportunities for this subunit to develop, and any independent panel needs to have correct information before it can make sound recommendations.

Actions for successful development
It is clear that visual neuroscience is an important unit of the Department of Neuroscience and should be highlighted. In particular, the panel was excited about the new group in motion vision, and an action here could be to give support and allocate resources centrally, to support for a PhD student, postdoc or similar, and to facilitate the development of this group in the department as it has obvious promises for the future. It is particularly noted that whereas the young group attracts successful potential PhD students, there are no resources to enrol them in PhD training, and instead these promising students instead have to register with financially stronger and more established units.

As in the KoF07 report, the retinal cell biology group should also be recognized as a priority. Furthermore, it is clear that the small group of pediatric ophthalmology with limited resources has truly made an effort during the last few years, and its international recognition is evident from the EXPRESS publications among other things. It would be interesting to see if resources for example for a seminar series in visual development and computational analysis could be
of value for the development of a stronger interaction between the subunits of the visual neuroscience unit.

**Effects of the KoF07-evaluation**
The thematic unit itself is the result of the KoF07 recommendations to strengthen the visual neuroscience at Uppsala University, and it will be of considerable interest to see whether this action will have desired effects.

**Other issues**
The retinal cell biology group is the leading research group within the unit, and it will be of interest to see whether with adequate support this group could enhance the interactions in particular with the pediatric ophthalmology and motion vision subunits.

### Clinical Neurophysiology

**General assessment of the unit**
As recognized already in KoF07, the unit of Clinical Neurophysiology has a long-standing international reputation. It is currently described as consisting of three well-balanced subunits: neuromuscular, somatosensory nervous system, and central nervous system. The activity is highly multidisciplinary and truly translational, and the compositions of the research groups demonstrate an encouraging diversity in age, gender, etc. It is further recognized from the report and presentation that the unit leader since KoF07 has received a substantial increase in funding from the Swedish Research Council, and that the unit has taken the recommendations of KoF07 seriously in many if not all regards.

**Quality of research**
The unit has successfully maintained the quality of the scientific research to be of internationally high standard across the different research groups during these years, as demonstrated by, among other things, the increased external funding and several publications in very prestigious journals. The panel further wants to highlight that such strength in research in combination with an internationally leading clinical activity makes the unit a prime example of successful translational research for Uppsala University and the county council to recognize.

**Research environment and infrastructure**
In KoF07, a point of criticism was that the general age of the group leaders of the unit was relatively high. It was now noted that several recruitments of researchers, specialists, and residents had been pursued at several of the units. It is indeed particularly important to maintain the high quality of the research to recruit strong clinicians with clear research interest, and this work thus has
to continue. The infrastructure and technological advancements are very good.

Networks and collaborations
National networks and collaborations are very good in all three subunits, and the international interactions are also excellent in the neuromuscular and somatosensory nervous system groups, but could be improved in the central nervous system subunit.

Opportunities for renewal and emerging science
It is noted that the unit after KoF07 has improved the recruitment of junior researchers. It is now important that the subunits provide an environment for these and future recruitments to nurture development of their research activities and interactions within the Department of Neuroscience (e.g., visibility). This is the responsibility of the unit and subunit leaders and requires an extra effort in engaging in the projects and activities of the recruited/junior researchers and specialists.

Actions for successful development
The unit has improved in collaborations and recruitment of junior researchers as was recommended in KoF07, and it is important that this work continues to maintain the quality. As pointed out above, a key issue is for the unit/subunit leaders to make an effort to nourish not only continued recruitment but the right environment for the recruited personnel. This could for example be done by centrally allocating resources for PhD students specifically to newly recruited researchers.

Effects of the KoF07-evaluation
As commented upon above, the unit has taken the recommendations from KoF07 seriously and followed most of its recommendations. Similar to the neurotrauma unit, the combined strength of the clinical and research activities at the clinical neurophysiology unit makes it a very strong, possibly excellent environment that should be encouraged by allocated resources from the central university as well as the county council.

Neurology

General assessment of the unit
The research activity of the department is patient-oriented and the scientific projects reflect this arising from questions from daily clinical practice. The university staff consists of one professor, one guest lecturer, one 20% adjunct professor, one 20% adjunct lecturer, 8 PhD students and 3 postdoctoral fellows. The medical staff consists of 12 specialists, 7 neurologists in-training, and 10 locums. The academic staff has clinical duties (usually 30%) and on the other hand the
medical staff has 20–40% of their time for research except for the lecturers who have 80% of their time for research. This may be one of the reasons why the scientific output of the department has been relatively modest. However, it is appreciated that clinical research also requires clinical and patient work.

The department is strongly clinically oriented. It does not have its own research laboratory, but on the other hand collaborates with other units within the Department of Neuroscience of other units in the university campus. Some new research projects include studies on i) clinical variety of low-grade gliomas, ii) CSF dynamics in normal pressure hydrocephalus, iii) immunological response during relapse in multiple sclerosis, and iv) vesicular glutamate transporter in focal epilepsy. Even this, although being “some” of the “new” research projects seems to be quite many given the relatively small number of academic staff.

**Quality of research**

In general, the quality of research is of acceptable standard, although not at the top level of neuroscience. Strong research line is studies in low-grade gliomas. The strength includes a long tradition of good follow-up (up to 20 years) of patients. Also introduction of interdisciplinary methods and approaches has recently been introduced. The Uppsala Glioma Group has a potential to produce high level science now also including as new members experts in neuropathology and neuroimaging. The glioma research line would further benefit from concentrating on their possible strengths, i.e. long-term follow-up, collaboration with the Uppsala PET Centre (with novel tracer for tumour imaging) and from strengthening the collaboration with other units in the Department of Neuroscience.

The other groups have also published interesting papers in good international neurological journals, especially in epilepsy and Parkinson’s disease. These research areas would also benefit from increasing collaboration with other experts in the Department of Neuroscience enabling to go deeper in each research area. One example of this is the neuropathological and tissue micro array analysis of tissue removed during epileptic surgery.

**Research environment and infrastructure**

The department has several experienced clinicians and has access to a wide variety of neurological patients. The clinical examination and follow-up of these patient populations has great potential. However, in a clinic with relatively small catchment area, it is difficult to collect adequate patient numbers in a reasonable time frame given the relative rarity of many neurological diseases. Thus strength would be better built on focusing on unique aspects and special expertise in the department.

One problem is the relatively small amount of “man working hours” the department (taken medical and academic staff together) has for research. The lack of own laboratory is a limitation, but on the other hand recently more and more
collaboration between other departments in the Department of Neuroscience has emerged.

**Networks and collaborations**
The establishment of the Uppsala Glioma Group is appreciated and can in the future lead to important scientific results. The department would probably also benefit from stronger association with other departments in the Department of Neuroscience and with other relevant units (like the PET unit). This could for instance allow combining in vivo imaging studies with histopathological, biochemical and immunohistochemical changes in tissue biopsies (from patients with low grade glioma or focal epilepsy).

There is collaboration with clinical centres nationally (e.g., in treatment trial in low-grade glioma) and internationally in relationship to rare neurological disorders.

**Opportunities for renewal and emerging science**
The department has already intensified collaboration with the Department of Neuroscience and this is encouraged to be a continuing trend in the future. Translational aspects of research have thorough preclinical collaboration. New resources that could strengthen the disease are recently recruited experts in neuropathology and neuroimaging.

**Actions for successful development**
The panel suggests the department might focus on research lines that have potential to be internationally even more recognized (such as the glioma research line). Ensuring enough time for clinical and academic personnel for research is another key element in the future success. The founding of the Uppsala Glioma Group is a step in the right direction and should be emphasised. Further collaboration with other groups (such as neuropathology, structural and functional MRI and PET) is encouraged.

**Effects of the KoF07-evaluation**
There are certain improvements following the KoF07 evaluation. Collaboration with preclinical and clinical units has increased, translational studies have been initiated and tissue biobanks are being collected (blood, cerebrospinal fluid, and tissue). The medical and academic staff has increased somewhat, but not really significantly. The situation of difficulties to combine clinical duties with academic studies seems to prevail. The number of publications has increased and three PhD theses and three half-time theses have been finalized. What seems to be unchanged is the diversity of small research lines with relatively small number of staff. Having said that, one must admit that the glioma research line has improved its profile.
Neurotrauma Consortium

General comments
Neurotrauma research done by this consortium clearly has high international standard. The excellent work has been achieved by collaboration of three highly experienced scientists: Per Enblad, Lars Hillered, and Ted Ebendal. Their research covers basic, but innovative, clinical practice of traumatic brain injury – TBI (Enblad) using standardized care, secondary insult program, computerized multimodality monitoring and imaging (mobile CT). In experimental neurosurgery lab (Hillered) extensive experimental work is performed using several TBI models in rodents, in vitro brain injury model, behavioral testing, immunohistochemistry, molecular methods, microdialysis and human TBI tissue. This extensive experimental approach, particularly the focus on oxidative stress and inflammation, has led to new interventions. The role of antigen-presenting cells and chemokines analyzed by gene chips in proteomic biomarker studies is highly novel and brings the attention to the role of inflammation not only in trauma but also in Alzheimer’s disease, MS and ALS.

Quality of research
The research is of internationally (very) high standard. The collaboration of the three groups opens great translational opportunities. From 2008 these groups have published more than 60 high impact publications and several reviews. Equally contributing to publication report is clinical as well as basic experimental work and animal modelling. As an innovative measure we note the establishment of a new research group concentrating on stem cells and biomaterials used in TBI, which can become a complementary part of the TBI consortium.

Research environment and infrastructure
All these groups are located in the same building, clinical practice as well as experimental labs, which allows extensive and fruitful collaboration of researchers and students and serves as an excellent platform for translational medicine. There is a great number of students involved in clinical as well as in animal research. It is important that students also have opportunity to be in contact with clinical practice and visiting scientists.

Networks and collaborations
There is an extensive national and international collaboration in several research networks as Uppsala Brain Injury center, The European Brain Monitoring with Information technology (Brain-IT project), where 17 countries collaborate, and Avert-IT project (EU grant from FP7). The Center of Excellence Neurotrauma was inaugurated in 2008 between Uppsala University Hospital and Uppsala University. The group is actively involved in Uppsala Berzelii Technology Centre for Neurodiagnostics to improve multidisciplinary work on biomarkers and neurodiagnostics.
Opportunities for renewal and emerging science
There could be close collaboration with the newly formed group dealing with stem cells and biomaterials. The group has also a good opportunity to collaborate more closely with the rehabilitation unit.

Actions for successful development
This group has tremendous potential and should be sufficiently supported by the university to ensure funding to pursue all projects which were started till now. All support should be given to the new stem cell group.

Effects of KoF07-evaluation
The group has both promoted and reinforced excellence.

Other issues
It is important that several medical students are involved in projects. The research is of the great interest for public, and educational publications and lectures for public could be arranged.

Rehabilitation Medicine

General assessment of the unit
No-one from the department was present at the meeting and we were told that Carl Molander (Adjunct Associate Professor) had left the department at Uppsala and relocated to Stockholm in May 2011.

Quality of research
This was not possible to assess but from the documentation received, there is still research activity in the group.

Research environment and infrastructure
Rehabilitation medicine is a very important part of the infrastructure of the Department of Neuroscience and is especially relevant in the context of the work of the neurotrauma, neurophysiology, and psychiatry units. The panel felt that the unit should be fostered and encouraged in view of its potential importance.

Networks and collaborations
Not known.

Opportunities for renewal and emerging science
Not known.

Actions for successful development
A new professor/unit lead should be appointed.
Effects of the KoF07-evaluation
The unit was rated as acceptable in KoF07 and appeared to be improving at that time.

Psychiatry

General assessment of the unit
Research in psychiatry is multifaceted and has to be regarded as very much a part-time activity because of the demands on teaching and clinical work on the seven university teachers, two of whom are retiring this year. Professors Ekselius and Willebrand have expanded work in the burns unit and combined the demands of improving clinical care with evaluative research on outcomes in several modalities. A strong component of Swedish psychiatry is research into the delivery of internet-delivered cognitive behavioural therapy and this is doing well but in some danger of being overtaken by adjacent university departments. There have been some good established studies into the long-term follow up of adolescent depression but it is sad that there are no significant links with child and adolescent psychiatry so that the full value of this can be exploited.

The placement of the research group within the Department of Neuroscience facilitates the exchange of ideas with neurogenetics, neurophysiology and rehabilitation.

Quality of research
Professor Ekselius continues to head up the unit and her own group has been successful with contributions that are internationally recognised but the work of the unit as a whole, despite improvement since 2007, remains of acceptable standard only. There are six PhD students and the number of dissertations remains stable; there is likely to be potential for future development within this group. There is still a need to concentrate on fewer research subjects.

Research environment and infrastructure
The new psychiatry building has the potential of improving the research infrastructure of the department. Professors von Knorring and Hallman are near retirement but there are promising junior staff who are making a research impact. It looks as though the schizophrenia and neuropsychiatry components of research may be run down but there are new ventures forthcoming that would benefit from integration.

Networks and collaborations
With the new psychiatric unit being built on the main neuroscience campus in 2012 there should be stimulation of cross-disciplinary research. There is a great opportunity for psychiatry at all levels to be linked in collaborative research to neurogenetics, neurophysiology, physiotherapy, functional pharmacology...
and rehabilitation, but at present many of the collaborations have been outside Uppsala or outside the Neuroscience Department. Whilst there is no reason to prevent or hinder successful external collaborations we do not feel that at present the internal ones have been adequately explored.

**Opportunities for renewal and emerging science**
A great deal depends on the appointment of a new professor to replace the retiring staff but at present the signs are not encouraging. The possibility of a more focused unit with more research funding similar to that headed by the Lannfelt group might be explored.

**Actions for successful development**
More leadership is needed in the department and there is an urgent need for a new professor (or equivalent) to have both the power and intellectual authority to bring the different parts of the department together into a unified group. Bearing in mind that there is unlikely to be a new professor appointed soon it would be appropriate for Lisa Ekselius to take on this task. It would be mutually productive for the links with the neurotrauma, functional pharmacology and physiotherapy departments to be actively developed. One area of research which has been most productive in the last few years has been work on eating disorders and this could be given much greater prominence. If the newly appointed professor does not take up the appointment it might be preferable for talent within the department to be nurtured and developed to ensure good internal promotion in the future.

**Effects of the KoF07-evaluation**
In KoF07 it was recommended that research should become less disparate and there should be “a clearer focus on a much smaller number of topics”, and that there should be more hypothesis-driven research. The department has become aware of this but it is only the Ekselius/Willebrand group that has concentrated on developing excellence in a well-focused area, but there is the potential for a group to form around Papadopoulos.

**Disaster Psychiatry**

**General assessment of the unit**
The National Center for Disaster Psychiatry (KcKP) is part of the Department of Neuroscience but has been in existence since 2002 and cannot be regarded as equivalent to other departments as its staff (P.-O. Michel and T. Lundin) and its continued work is guaranteed by external funding. Its main tasks are to provide a service both to anticipate and deal with disasters as they affect Swedes in all parts of the world and its research component is small. However, despite this we were not aware of any active research projects in the unit at the present
time or specific ones planned for the immediate future in the presentation and discussion with Per-Olof Michel.

**Quality of research**
Only five peer-reviewed publications in cited journals have been published in the past four years and Tom Lundin is retiring in December. Using the standards that need to be applied universally in the university this quality is insufficient. In making this decision we still recognise the importance of disaster psychiatry as a national service quite independent of its research component.

**Research environment and infrastructure**
The unit is separate from the Department of Neuroscience and has very little contact with other units. There are two PhD students but their work was not discussed. Much of the work of the unit is linked to pan-European studies but these are not initiated in Uppsala.

**Networks and collaborations**
The unit is well connected to other national trauma organisations elsewhere in Europe.

**Opportunities for renewal and emerging science**
The unit received income of € 400,000 annually and this is secure. It is uncertain whether this funding could be increased if more research was undertaken but there are also opportunities for external funding linked to the international collaborations.

**Actions for successful development**
With a new head of the unit there could be a re-evaluation of the research focus.

**Effects of the KoF07-evaluation**
This unit was not discussed in 2007.

**Child and Adolescent Psychiatry and Psychiatric Genetics**

**General assessment of the unit**
The department is currently in the process of considerable change, with the impending retirement of Anne-Liis von Knorring and recent appointment of Frank Lindblad as associate professor. It is currently supporting a large number of projects with (mainly part-time) staff, and although the volume of published papers is large, most of them are of low impact. The research on psychiatric genetics and gene-environmental interactions (with Lars Oreland leading) is linked to a general theme of vulnerability to psychiatric disorder – probably too general a subject to build a research programme around – and unfortunately,
despite an excellent track record in the past, this is no longer cutting edge research and is likely to have little impact on what is now a very active field for genetics investigators. It does not help that the unit is isolated from the rest of the departments in Uppsala University, many of which have potential collaborators and subjects of interest. The unit feels that it already has good collaborations and does not regard the lack of links within neuroscience as a handicap, but it probably does have a negative effect on its performance. This has been a productive unit in the past but is in need of relaunch and invigoration.

Quality of research
The quality of research in the unit is regarded as of acceptable standard (compared with ‘internationally recognised’ in 2007). The problem is that the unit appears to dip into every area of psychiatry rather than concentrating on specific subjects and developing skills and research output that could be world-leading. The willingness of the staff to encompass the research interests of its students and researchers could be regarded as commendable but it probably hinders the development of better skills and expertise centrally.

Research environment and infrastructure
The unit is traditionally linked to paediatrics but most of its links are elsewhere. It is very unfortunate that the unit will have no presence in the new psychiatric unit being opened in 2012. This exclusion should be reconsidered. The current accommodation could still be maintained.

Networks and collaborations
There are good international networks to Kurdistan, Tampere (Finland), Oslo, Hamburg, and London, but these are all concerned with different projects.

Opportunities for renewal and emerging science
A clear strategy for the future – both short and medium-term – needs to be developed in the unit if it is to do well in the Department of Neuroscience. It is far from certain what this strategy should be, as child and adolescent mental health research can move in many different directions, but the current interests of the unit suggest that better links to neuroscience at Uppsala would be productive, provided the drive to develop these is present; it should not be imposed. A particular focus on eating disorders in all parts of the psychiatry discipline would be a successful theme.

Actions for successful development
A strategy group should be established within the unit to examine all the current research, both active and planned, and to decide both on priorities and coordination. This would not necessarily lead to any projects being abandoned but resources and collaboration could be increased for studies that were central to the strategy.
Effects of the KoF07-evaluation
In the KoF07-evaluation the child and adolescent psychiatry group was rated as internationally recognised but the general criticism of psychiatry as being too disparate in its research also applied to child and adolescent psychiatry.

Physiology

General assessment of the unit
The physiology research is organized into 3 different thematic groups under the following headings: (A) Molecular physiology and pharmacology of ionotropic GABA receptors, (B) Gastrointestinal physiology, and (C) Behavioral neuroendocrinology.

The group in charge of subheading A (B. Birnir et al.) conducts research aimed at molecular and pharmacological characterization of extrasynaptic GABAA receptors which have been shown to differ from their synaptic counterparts by exhibiting higher affinity for GABA and having distinct subunit compositions containing the α4 and α6 subunits. This research group has been instrumental in the identification of this class of GABA receptors which in recent years have turned out to be important targets for drug development. The current research of the group is additionally focused on studying these receptors in relation to the immune system, the role of GABA for tumor growth and development, and for the function of pancreatic cells and insulin release.

Subgroup B (O. Nylander and M. Sjöblom et al.) is focusing on research aimed at characterizing mechanisms involved in the regulation of duodenal mucosal protection and barrier function as well as the release of gut hormones. The emphasis is put on the effects of melatonin, alcohol and hexamethonium.

Subgroup C (S. Winberg et al.) is involved in research related to the understanding of mechanisms responsible for development of stress responses in animals using the zebrafish as a model system. These studies are incorporated into the development of international research networks the aim of which is to improve conditions for farmed fish to avoid stress-related problems.

All groups are internationally oriented and they have developed high quality research profiles.

Quality of research
The research groups are characterized by performing novel and innovative research at a high level which for groups B and C is assessed as of internationally recognized standard while the level of the research activity of group A is of internationally high standard.

Research environment and infrastructure
The groups have good research environments and personnel compositions and there is considerable local, national and international collaboration. In particu-
lar, the Nordic and EU funding of group C should be noted. In terms of infrastructure it should be noted that group A is in need of improved infrastructure allowing a combination of electrophysiology and imaging to be performed. It is recommended that this is given high priority when distributing departmental funding.

Networks and collaborations
As mentioned above the research teams have developed excellent networks and international collaboration.

Opportunities for renewal and emerging science
All three research groups have good plans for future research activities and plans and ideas appear appropriate. This is also the case for the junior faculty of the groups.

Actions for successful development
While the level of research in group A is already at a very high level it is recommended that additional resources are allocated to groups B and C as both of these have great potential for improving the international standard of the research projects.

Effects of the KoF07-evaluation
Group A was established subsequent to the KoF07-evaluation and clearly the incorporation of this research unit has had a positive impact.

Other issues
The research activities of these groups are highly relevant for society and the economic benefits from the research project could potentially be quite high.

Developmental Genetics

General assessment of the unit
This unit is led by Klas Kullander who is currently funded in a 5-year contract from the Royal Swedish Academy of Sciences. The unit has currently a staff of 25 including 4 PIs, 12 postdocs, and 9 PhD students. The presentations from the group signalled enthusiasm, clear ambitions and strategies, and attested a high ongoing activity. The following areas were identified as being of particular interest to the group: development and functions of neuronal circuits, mechanisms of excitatory functions and excitotoxicity in neurological disorders, Eph and Ephrins in cell communication and advanced genetic tools to study nervous system functionality. The group commands a series of potent and state of the art techniques that make it an attractive partner for internal and external collaboration, which should help increase its competitiveness in the international arena.
During the KoF07-evaluation the unit had two PIs, Klas Kullander (unit head) and Åsa Fex Svenningsen. Since then, the unit has been considerably strengthened, and now has four PIs, Klas Kullander (unit head), Åsa Wallén-Mackenzie, Leao Richardson, and Malin Lagerström.

Quality of research
The panel is of the opinion that the unit of Developmental Genetics has now established itself among the leading groups internationally in the field of neuronal circuit analysis. The research of the unit is therefore rated to be of top-quality. Already at this early stage the group has left its mark in the field. Notably, the group recently published important observations in a transgenic model based on deletion of the gene encoding the vesicular glutamate transporter, VGLUT2. In his earlier work performed elsewhere, Kullander has published seminal observations on the roles of Eph and Ephrins.

Research environment and infrastructure
The group is young and dynamic and has established local collaborative networks within several topics including ALS, schizophrenia, clinical neurogenetics, and traumatic brain injury. Obviously the group is vulnerable: according to the information made available to the panel it is funded in its entirety through external sources (except for a startup grant from Uppsala University). Despite the lack of significant local funding the group has been able to build up an impressive range of methods and technologies. Very recently, 2-photon imaging of live tissue has been started in the unit.

Networks and collaborations
As described above, the group is engaged in several collaborations within the department and displays a clear willingness and ability to unleash local synergies. The group is involved in a number of international collaborative projects. However, there seems to be a potential for an even stronger interaction with international partners. Efforts should be also made to attract support from the EU 7th framework programme.

Opportunities for renewal and emerging science
The unit of Developmental Genetics has already established itself on the forefront of neuronal circuitry analysis. The unit is very strong in molecular biology which is now connected to sophisticated imaging analysis of live tissue using 2-photon microscopy. This combination of modern techniques creates novel opportunities to create seminal scientific findings. In general, combining molecular/cellular studies to systems level phenomena, including studies on neuronal circuits and behavioral analysis, is a challenging but a realistic task since the necessary technology is available within the unit.
**Actions for successful development**
There is an obvious need to reduce the group’s dependency on external funding.

**Effects of the KoF07-evaluation**
Two PhD students have been recruited based on KoF07-money from Uppsala University. Overall, the favourable KoF07-evaluation may have contributed to strengthening of the unit.

**Other issues**
The unit does not participate much in teaching. The unit has sophisticated and novel technology at its disposal that could be used for teaching and raising enthusiasm in students. The panel learned that Klas Kullander gives frequent presentations to students that go down well; continuation of this form of lecture is encouraged during the years to come.

Due to collaborative research, Ola Hermanson did not participate in the panel meeting rating the unit.

**Molecular Cell Biology**

**General assessment of the unit**
The unit of Molecular Cell Biology is a very small unit that was relocated to the Department of Neuroscience after KoF07. The research topic is cellular neurobiology and the focus is on membrane dynamics with important implications for synaptic function in general and neurobiological function and disease, including feeding behavior. A wide variety of techniques from biochemistry to behavior are employed, both within the lab and in fruitful collaborations with numerous groups both within the Department of Neuroscience, Sweden, and also internationally, in particular in Göttingen, Germany.

**Quality of research**
The quality of research 2007–2011 is considered to be of internationally recognized standard, very good work. It is noted that after a couple of years with good but modest production, the unit has at the time of evaluation with very modest external funding an impressive line of results and high-profile and potential high-profile publications in press and pipeline, and it will be of interest to monitor the publication record of the unit in the close future.

**Research environment and infrastructure**
The already previously small unit has recently decreased further and is now consisting of one professor and one technician. The extensive collaborations are essential for the publication record, but the unit structure as such is currently obviously not sufficient to maintain any competitive research environment.
Networks and collaborations
The unit has a strong network nationally and internationally, in particular in Germany, but now also at the Department of Neuroscience. It may be considered whether the networks could be of benefit for attracting external funding, from national or international funding bodies.

Opportunities for renewal and emerging science
The interactions within the Department of Neuroscience are good, but in general, the opportunities for renewal within such a small unit must be considered very limited.

Actions for successful development
Although the panel considered the quality of research of the unit to be high, the small size of the unit is a major problem for any successful development. The unit lists no external funding for 2008–2010, and if a sustainable action from the university leadership is not taken, the future of the unit must be considered very insecure.

Effects of the KoF07-evaluation
In KoF07, the relevance of the unit’s activity to the neuroscience department was recognized, and the group was therefore relocated there. The panel recognizes that, at least from the scientific viewpoint, this has clearly had a positive impact and the results from the intradepartmental collaborations are positive.

Other issues
Only two students are mentioned to have defended their PhD theses from the time the unit has been active in Uppsala.

Restorative neuroscience (former Regenerative neurobiology, evaluated in KoF07 in Neurotrauma consortium)

General comments
Research in this group is mostly concerned with spinal cord injury repair and as such it is very ambitious. The group has concentrated on two main objectives: (i) repairing lost function in spinal cord and (ii) the influence of neural stem cells on survival and function of co-transplanted beta cells. The research done by this group is important and highly competitive in both national and international level. The group was previously guided by the experienced scientist Håkan Aldskogius. However, in last few years, during the period that Aldskogius was the head of the Department of Neuroscience, this group has become less productive. Currently, the group leader is Elena Kozlova. Her limited experience has led to a degree of methodological stagnation and the panel could not
see a clear strategy for future research development. Although the group does reasonably good work, which has relevance to current restorative medicine, it mainly attracts national interest. Nevertheless, despite these criticisms, some new ideas presented by Dr. Kozlova, together with adoption of new animal models, molecular and behavioral methods, suggest that the unit can substantially improve research outcome of this group in the future.

Quality of research
The research is of acceptable, but mostly of national, standard. The group is working with rather old methods, i.e. model of spinal cord injury repair using transplantation of stem cells to dorsal root ganglia cavity to create a loop around spinal cord injury. Outcome is determined mainly by using histochemical methods only. The collaboration with the other groups in the Department of Neuroscience may increase research quality by introduction of new spinal cord injury models, electrophysiological methods, genetics, imaging and behavioral testing. For the group as a whole, which has besides Dr. Kozlova several postdocs and PhD students, the publication record in last three years is poor. There is number of long term suggested projects, which has so far not been seriously started.

Research environment and infrastructure
This group is located in the BMC and as such has excellent possibilities for collaboration with other groups, for implementation of genetic, electrophysiological and imaging methods and to use transgenic mouse models as indeed they plan to do as a long term objective. There is a number of students involved in animal research. It is important to improve the publication record so that students have the opportunity to defend their thesis works.

Networks and collaborations
There is some national and international collaboration; besides that with the Faculty of Science and Technology and with Uppsala Berzelii Technology Centre for tissue engineering and delivery systems development, the group could benefit from even broader collaboration with best country stem cell groups in Lund and Stockholm as well as from attracting some visiting scientists. The two most important publications in last three years were done in collaboration with groups at Karolinska Institutet and in Erlangen. Other collaborations are however being considered in their plans.

Opportunities for renewal and emerging science
The research topic, spinal cord injury repair, is in the forefront of scientific interest. Many new findings in last few years have unfortunately not been exploited in the research plans of the current group. This group has a very promising team of young scientists but it needs a strong leadership.
Actions for successful development
The group needs to attract, at least for a temporary period, an experienced senior researcher to give this group a strong new start, renewal of techniques and emerging strategies in spinal cord repair research. The collaboration with the Diabetes Research Centre in Brussels does not appear to be central to the work of the group.

Effects of the KoF07-evaluation
The group has not significantly changed its experimental plan and it has not improved the quality of methods and strategies.

Other issues
The research is of great interest to the public and patients. As such the research should have more translation orientation by using more proper models and testing of stem cell transplantation outcome.

Geriatrics in the Department of Public Health and Caring Sciences

[The Department of Public Health and Caring Sciences was evaluated by panel 21, see page 445 et seq.]

General assessment of the unit
This is a very active and productive department. The main areas of research are molecular studies on dementia and clinical and epidemiological research in diseases of old age. The dementia research has four main research lines: i) clinical and epidemiological studies in dementia, ii) studies on diagnostics and biomarkers, iii) studies on pathogenesis/treatment, and iv) genetics. The last area (genetics) has got less attention in recent years. This is a sign of renewal and focusing, knowing the strong interest of the department leader (Professor Lars Lannfelt) in genetic aspects of dementia in the past.

The main focus in Alzheimer’s disease (AD) is based on so called “amyloid hypothesis”. In focus is especially the role of soluble beta-amyloid protofibrils (oligomers). The research group has developed an antibody against beta-amyloid protofibrils. In previous studies the protofibril level has been shown to be associated with spatial learning impairment in transgenic “AD-mice” and the antibody directed against these protofibrils can prevent beta-amyloid plaque formation and impairment of cognitive performance. Very recently a humanised form of this antibody has been developed and the first clinical studies in patients with Alzheimer’s disease have been started.

The antibody against beta-amyloid protofibrils has been labelled with Io-
dine-125 to be used in ex vivo and in vivo imaging. First results in mice look very promising. Thus there is a potential for this tracer to be a new biomarker for early amyloid pathology. Nowadays disease modifying treatments, most of which target the amyloid cascade, are under development. If any of these turn out to be successful, treatment efficacy is likely to be greater the earlier it is given. In the future the ability to make a reliable diagnosis as early as possible will become increasingly important.

An important clinical/epidemiological study is the Uppsala Longitudinal Study on Adult Men (ULSAM). In this study a initial cohort of 2232 50-year old men have been followed now for 41 years. This gives unique opportunity to find midlife life-style factors or biomarkers (blood samples) that could predict cognitive impairment and dementia in later life. It also allows to find predictors for successful aging and first results are emerging.

Another research line in neurodegenerative diseases and “misfolded proteins” are studies on alpha-synuclein in Parkinson’s disease and dementia with Lewy bodies. Analogous to studies in AD an antibody against the alpha-synuclein protofibril has been developed that seems to be specific and sensitive both in an animal model and human brain samples. This research line at present stage is not as advanced as is the AD research, but has great potential both from diagnostic and therapeutic perspective.

Quality of research
This is undoubtedly a unit with top-quality research at world leading level with great international impact. Since 2007 altogether 176 articles have been published, many of which in top international scientific journals. In addition 8 reviews and 10 books/book chapters have been produced. This is great improvement as compared to the situation at KoF07 evaluation.

The most novel idea is the development of antibodies against beta-amyloid protofibrils that are most probably more important for the pathophysiology of the disease that fibrillar plaque beta-amyloid. This kind of antibody has a potential to be both an early diagnostic and a therapeutic tool, both of which are urgently needed for AD.

Research environment and infrastructure
The total amount of people engaged in dementia research at the department is around 30 people encompassing a professor, four associate professors, two adjunct professors, several postdoctoral persons and PhD students and three research nurses.

The research environment seems to be adequate for the unit and its targets. It may be that in the future with expansion of the studies new recruitment of research staff will become necessary.

Networks and collaborations
The research group has collaboration within the department. In addition in
development of the new imaging agent for beta-amyloid oligomers has taken in collaboration with the Uppsala PET Centre. The development of anti beta-amyloid protofibril antibodies as potential treatments for human AD takes place in collaboration with BioArctic Neuroscience and Eisai Pharmaceuticals (Japan).

**Opportunities for renewal and emerging science**
The group seems to have a consistent strategy and a good track record. At present there is nothing to suggest that the group should change their focus. However, alternative strategies could be at least considered (see the next topic).

**Actions for successful development**
The group has a clear focus and research plan. However, it is good to remember that amyloid hypothesis is not the only hypothesis for the pathophysiology of AD. Thus, alternative strategies including, but not limited to, tau-pathology, inflammation, etc. could be considered as a back-up strategy. In addition, if one considers amyloid related diagnostic agents, one must bear in mind that this is pathology (amyloid), but not necessarily disease (AD) specific.

**Effects of the KoF07-evaluation**
Since the last KoF evaluation there has been significant and consistent development (i.e. the antibody against beta-amyloid protofibrils was under development and is now in clinical trials in humans). The number of publications has increased significantly and their level has even increased further. The research is even more focused with less genetics of AD being performed. The study team has been successful of recruiting and retaining talented and skilful postdocs. The research group has also been successful in obtaining a significant amount of external funding reflecting the credibility of its work.

**Other issues**
The unit has the potential for a strong societal impact.
Scope of the panel’s evaluation:
Department of Immunology, Genetics and Pathology
Ludwig Institute for Cancer Research (LICR)

Department of Immunology, Genetics and Pathology

General assessment of the department
The Department of Immunology, Genetics and Pathology has currently 30 PIs and 370 people in total, including both internally and externally supported staff. The department was reorganized in January 2011 by adding Clinical Immunology to the department. The new organization seems to work efficiently under the professional leadership of Professor Lena Claesson-Welsh and the personnel composition appears adequate and well balanced in terms of senior and junior researchers as well as PhD students. Already during the KoF07 evaluation, the department was praised for its performance and it has maintained its overall quality at high international level during the last four years, with several groups at the top quality level. This is also reflected in the extremely high level of grant funding obtained by the department. The vision, aims and strategies of the department are clearly formulated and if followed, the department will be in an excellent position to increase its already very high standard. All comments below should be considered as suggestions to help to keep the very high standard.

Quality of research

Genetics
The research activity of Genetics is overall very strong in terms of quality, although some variations in quality are apparent between the different groups. Particularly exciting are the top-quality activities of Chandra Kanduri on non-coding RNAs, Ulf Gyllensten on sequence-based analyses, and the work of Lars Feuk, although he joined the department only recently. Lars Feuk is an excellent example of the successful recruitment of a very talented scientist from abroad (irrespective of his Swedish nationality). The review panel was surprised, however, to learn that Uppsala University is not providing a tenure track option upon the employment of such a scientist. In the long run, the lack of a tenure track option – e.g., decided upon by international evaluation after five years –
will seriously harm the global competitiveness of Uppsala University, not only but particularly in the area of life sciences. As part of the university’s newly obtained autonomy, it should urgently establish such a process. Marie Allen’s work on forensic studies clearly generates high-quality science that holds great promise for the future as well as adds to the university’s national and international visibility.

**Molecular Tools**

As four years ago, the research activity Molecular Tools is the highlight of the department, displaying true originality, achieving top results scientifically and being able to attract vast amounts of funding. In addition, the transition to commercial and clinical use is being pursued successfully. Creation of a group leader position, suggested in KoF07 and filled by Mats Nilsson, strengthened the activity even further. The activity is well connected locally, nationally and internationally. It is an important player in ‘Molecular Diagnostics’, one of the central activities in the strategy of the department. However, the scientific basis should be widened by launching an international call for the recruitment of another independent group leader. The respective person should be recruited purely on the basis of scientific performance and promise. In particular in the area of proteomics and in combination with activities such as the Human Proteome Atlas this could consolidate and even excel the excellent and internationally very competitive position established for a long period of time. The research activity Molecular Tools is a real asset and highlight of the departmental activities. In order to maintain this level, splitting up the participating groups, by moving the group of Mats Nilsson to the BMC as currently considered, should be avoided.

**Neurooncology**

The Neurooncology program, led by B. Westermark, L. Uhrbom, and K. Forsberg-Nilsson, represents an outstanding activity of the department in a research field of high medical interest. The program involves the interdisciplinary but complementary experience of different senior PIs (K. Forsberg-Nilsson and L. Uhrbom) and young scientists, who work synergistically to acquire new knowledge on the molecular mechanisms of brain tumor generation and progression. The mission is the improvement of the diagnosis and therapy of brain tumors, a feature that identifies it as a translational program. The recruitment of scientists has been very successful and the program is of internationally high standard.

Current research activity is focused on the characterization of cancer stem cells or glioma-initiating cells through establishment of cancer stem cell lines from fresh biopsies. The goal is to better assess the genotype and phenotype of such cells as compared to an unselected tumor cell population by selective transcriptome mapping. Also their response to treatment is evaluated in an attempt to identify biomarkers of susceptibility to different therapeutic agents.

An additional strategy is to analyze the tumor microenvironment and identify molecular pathways that could be targeted to skew pro-tumor cells of the
microenvironment to become anti-tumoral. The research environment is attractive, local collaborations with, e.g., genetics/genomics and neuropathology may provide a competitive advantage, and necessary infrastructure, state of the art core facilities and equipment are available in-house. Less clear is the translational development of this research activity, since the role of clinical collaborators, e.g., neurologists, oncologists, neurosurgeons, and pathologists is not defined. Strong and stable interactions between basic research investigators and clinicians should be explored.

Pathology
The pathology groups have at hand the relevant tools, although closer collaboration with both the Molecular Tools and the Human Protein Atlas activities could improve their scientific impact considerably, a point already made in the KoF07 report. The bio-banking activity is an important and successful development (see below, environment and infrastructure). Also, they could gain by even more scientific integration with the other projects of the department or on campus, to complement their clinical activities.

Hematology
The hematology research stretches from basic biology to clinical trials with excellent collaborations and is focused around functional, genomic and translational projects in chronic lymphocytic leukemia and multiple myeloma. The former is headed by R. Rosenquist and represents an excellent example of translational research. The group has published extensively during the last years, including several publications in high-ranked journals. The research is conducted within clinical networks on a national, Scandinavian and European level and is of internationally high standard and in some aspects top-quality.

The group leaders have received their professorships within the last years and are currently in a very active phase of their research with focused, limited-size research groups and with various competences and strong translational collaborations. They jointly steer the Uppsala Hematology network and thereby contribute to branding hematology as a focus point for medical research at Uppsala University. Since R. Rosenquist as well as H. Jernberg Wiklund are identified as key researchers for the university, action could be taken to further strengthen their potential. In the chronic lymphocytic leukemia program, the panel identifies a need to develop functional studies for further exploitation of the markers and profiles identified. Development of such a research direction could be considered against the very strong potential of R. Rosenquist. Clinical collaborators are of utmost importance for the continued success and further translational development of both programs. In this respect, the panel identifies a professorship in hematopathology and physician-scientist positions for clinical research in related fields as central.
Vascular Biology
The Vascular Biology Program is headed by L. Claesson-Welsh and aims at identifying novel vascular specific genes and modulators regulating angiogenesis. This line of research is of utmost importance to find new targets to prevent cancer growth and spread. The group has long experience in the field and a multitude of tools and methods available for its research. It is part of extensive networks both nationally and internationally. The group has been very successful in its efforts and has published many of its papers in the top journals including its recent findings together with a start-up PI C. Rolny (Neurooncology Program) regarding a regulator of tumor angiogenesis. The regulator is now further developed for human therapy. The work is of top-quality. The projects of young PIs (A. Dimberg and M. Hellström) fit well into the program and synergize with other projects within the program. Besides excellent scientific training Hellström has experience also in the biotech industry. This may help the program in the efforts to take the novel regulators further toward the clinic. Both young PIs have been successful in obtaining competitive funding and have potential to become future scientific leaders.

Clinical Immunology
This program has the mission of bringing basic science findings into clinical practice with focus on cell therapy of diabetes and cancer and is coordinated by experienced and productive professors (T. Tötterman, O. Korsgren). The presentations by members of the Tötterman group revealed that important projects are ongoing, most of which have a strong clinical translational impact. The activity is based on an intelligent application of similar basic science approaches for the therapy of different diseases including cancer. This requires synergies of different expertise that have been well integrated in the activity of the group. The research is of internationally high standard and the group has been able to show the potential of immuno- and gene-therapeutic approaches by means of an original strategy based on pre-clinical work (A. Loskog, M. Essand). Local and external (national and international) collaborations are active allowing a continuous flow of scientific and technical information toward the clinical application. Infrastructure is adequate and sufficiently available with the exception of GMP facilities and labs necessary for the cancer cell therapy that the group is planning to start in the near future. This requires additional funding by the university to reconstruct the GMP facility, of which the use and cost may be shared with other internal or even external research groups aimed at treating other diseases by this approach.

The Diabetes program aims at developing methods and approaches to transplant pancreatic islet cells. They are also developing tools to regulate innate immune reactions on artificial surfaces. The quality of this program is high, reaching the top-quality level. The senior PIs (O. Korsgren; diabetes, islet transplantation, and B. Nilsson; biocompatibility) as well as the young PI (P. Magnusson; islet vascularization) who presented the program have a strong reputation.
in the field. The research activity seems very well developed, leading to important publications in the field. There are evidently tight collaborations within the units belonging to the Diabetes program. On the other hand, interactions with the rest of the IGP seem currently limited, with the exception of the collaboration with the Human Protein Atlas. The research environment is impressive, with particular reference to the Nordic Network for Clinical Islet Transplantation (NNCIT), the Diabetes Virus Detection Trial (DiVID) and Excellence Of Diabetes Research in Sweden (EXODIAB). Personnel dedicated to the Islet Processing Facility are well qualified for production of GMP products. The rotation around the Islet Processing Facility, of personnel partially dedicated to islet production and partially to research program, represents an ideal solution for a core facility supporting the development of research activities.

In addition, Clinical Immunology includes the group of clinician scientist J. Rönnelid concentrating on immune complexes in rheumatoid arthritis and chronic infections, and impact of immune-complex-associated autoantibodies in rheumatoid arthritis. This line of work has found its niche within the field and represents clinical research of high international standard. A better integration of the group with the other programs of the IGP could help cross-fertilization with positive effects on the development of these research lines.

The Clinical Immunology groups have been successful in initiating and performing clinical trials based on their own and other pre-clinical data and, thanks to the high scientific quality of the research, can certainly be successful even in the near future, if adequately supported by the university. To further improve this line of research, involvement of clinical groups is necessary taking into consideration the different expertise required for biological therapy and/or gene therapy of cancer. The university should support the creation of the position of young physician scientists that may help in promoting and initiating new translational clinical trials in this area of study.

**Research environment and infrastructure**

The research environment and infrastructure of the department is well taken care of and provides the researchers with excellent service, for example in the fields of genetics (Genome Center), protein chemistry/interactions (PLA facility), histopathology (Tissue Profiling facility) and bioimaging (BioVis). Moreover, the department participates in the following unique undertakings. The biobank activity done as part of the U-CAN initiative will serve the department and the entire university by providing high quality materials but will also have an impact well beyond Uppsala University. Obtaining funding for the U-CAN initiative is yet another example of the successful fund-raising of the department in its effort to provide an infrastructure for excellent research.

The Human Proteome Atlas is a world-leading activity. The university and the department are to be congratulated for bringing about a third of the overall activity of Atlas to Uppsala. It has major implications for very many activities
in Uppsala and Sweden overall (and beyond) and represents an asset both in terms of infrastructure and expertise that could give the university a big advantage in the long run, with protein-based biomedical studies becoming of ever increasing importance. Plans do exist to take advantage of the unique structure and materials for expanding application beyond the Atlas activity alone and – as intended – should be integrated in the long-term planning of future activities at the department.

**Networks and collaborations**
The department has extensive networks at several levels – locally, nationally and internationally. Interdisciplinary networks include the hematology, neurooncology, clinical immunology, and cervical cancer screening networks. The Human Protein Atlas is a major undertaking at the department. The department also participates in strategic governmentally funded networks such as SciLifeLab-Uppsala, comprehensive cancer center, biobanking activities, EXODIAB, and StemTherapy.

**Opportunities for renewal and emerging science**
The department has currently several young and talented PIs, who have succeeded in attracting competitive funding from external resources. They have high potential for making scientific breakthroughs and to be future leaders. The panel realized the effort of the department to support these young colleagues, intellectually (mentorship program), financially and by providing excellent infrastructure. This creates excellent opportunities for renewal and performing science at the international forefront into the future, but also raises issues related to transparent research careers at the university (see below).

**Actions for successful development**
We would like to emphasize the following points, however, which we assume to be critical to maintain and possibly even improve the very high quality standard:

1. Implementation of a tenure track system at the university is necessary to provide an option for career development for the brightest young scientists. This system is also needed to guarantee high quality performance of the departments in the future. To attract scientists of high caliber in a very competitive global market, the university should put in place a tenure track option right from the start of employment. This issue is highly relevant in attracting young scientists, and is needed against the background of an expected generation shift among senior principal investigators and key clinical collaborators within the next 5–10 years. The department indeed claims to have a “clear and predictable career system for preclinical and clinical scientists” and has been successful in obtaining externally funded 4–6
years starting positions for young group leaders. Against this background, development of a tenure track system with key performance indicators is strongly recommended.

2. Similar to the situation in the KoF07-evaluation, the vast majority of the faculty have pursued their scientific careers from undergraduate studies to professorships, except for the postdoctoral periods, at Uppsala University. Undoubtedly, bringing in novel experience would contribute to the scientific milieu and is expected to increase the overall attractiveness of Uppsala University. Although the panel noticed that among the newest recruits, the number of scientists without Uppsala background is substantial, the panel recommends an extra effort to be put to attract faculty also from outside the ‘Uppsala breed’ to renew the university.

3. In the information session to the panelists, senior university management was concerned about the low number of EU funded projects at the university. The panel interviewed groups with outstanding success in raising EU money. Grants from, e.g., the EU or NIH, however, cause internal administrative problems with overhead and matching financial contributions from the university. As these agreements are made at the university level, the panel recommends that the university resolves this problem. Particularly in departments like IGP having several groups extremely successful in attracting grants, these issues create a risk to impair the development of the department as a whole. Strategies for grant management thus need to be rethought at the university/Faculty level.

4. The department would benefit from closer connections between basic and clinical research. Positions having a certain percentage of clinical and research activities (for example 40/60 percent basis) should be created to facilitate translational research. This could be financed with the ALF money. As the majority of the research activities within the department are directed towards cancer, a closer relationship and even reorganization to include Medical Oncology should be considered. High quality translational research would be a real asset in international competition between universities.

5. In general, investigator-driven clinical trials are badly needed in the medical community. The department is already running some of them. Due to the unique potential of the department to take the discoveries from the bench to the bedside, the panel recommends that the department supports this kind of activities.

6. International collaborations could be strengthened among young research group leaders as part of their strategies to take greater responsibility for developing the department’s research profile.

7. The core facilities should be strengthened further, particularly in terms of space and continuous renewal of hardware components. The latter is critical to keep the units competitive. The core facilities, for example BioVis, could be merged in order to improve accessibility, visibility and exchange.
8. As the department has marked activities in identification of new drug targets and developing advanced biological therapies, it would benefit from closer connections with the Faculty of Pharmacy.

**Effects of the KoF07-evaluation**

Since the KoF07 major changes have taken place at the organizational level. Clinical Immunology has become a part of the Department of Genetics and Pathology. Moreover, based on the KoF07-report the department has obtained more money to be able to recruit young scientists and improve core facilities. Also biobanking activities have increased. By contrast, collaborations with, e.g., the Faculty of Pharmacy and associated clinics are still limited.

**Ludwig Institute for Cancer Research (LICR)**

**General assessment of the unit**

The Uppsala Branch of Ludwig Institute is preparing to celebrate its 25th anniversary. Professor C.-H. Heldin has served as the Director of the Institute since its foundation, and with intelligence and insight he has been able to establish and maintain an operation of high standards. The institute has adopted a rather unconventional strategy, where practically the entire research is focused around two themes, PDGF and TGF-b signaling. This has turned out to be a strategy that has allowed the institute to become the most productive branch of Ludwig as measured by number of publications (14% of the LICR total) and citations (16%) per unit funding (5%), and is clearly an excellent investment by the LICR. The institute is operating on EMBL-like principles, where the PIs are internationally recruited and spend 5–10 years and then move to other universities and institutes. Indeed, over 50% of the scientists in the institute are from abroad, which contrasts sharply with the local atmosphere in the university departments. The operational principle, including the personal mentoring by Professor Heldin, has worked extremely well, and 14 PIs and 15 former postdocs are now professors in prestigious universities around the world. The operational structure is also otherwise highly functional, with lean administration and efficient decision making, and full emphasis on high quality research. The institute is localized in the BMC building, and is functioning in good cooperation with the university departments. The university has acknowledged the importance of LICR and is contributing to its operation by taking responsibility for rental costs (SEK 3.5 million).

Some important developments have taken place since KoF07. The most dramatic was the initial threat of closing the entire branch due to the altered economic position of LICR. Professor Heldin was, however, able to secure the
continuation of the institute until his retirement. In our view this was a very wise decision by LICR, and an extremely important one for Uppsala University. Nevertheless, the funding for the institute has decreased by 50%, which has required substantial adjustments in the operations that have now been completed. As a result, the number of research groups has decreased to four (and one affiliated group [A. Moustakas] from Uppsala University), and three groups that are continuing collaboration after the PIs moved to other universities. The affiliated position and operation of A. Moustakas is a correct strategic move to develop closer cooperation with the university, which was also one of the recommendations of the KoF07. The establishment of affiliated positions with three highly successful former LICR PIs (Professor Miyazono, Professor ten Dijke, and Professor Landström) can be considered as smart moves to further increase national and international cooperation and high quality research cost-efficiently.

Although the future of the institute appears to be relatively secure for the next few years, the leadership needs to be highly alert to develop its operations and respond to the changing environment. The present research groups range from high international level to world leading (A. Moustakas). LICR is encouraging translational approaches and both Profs. Moustakas and Heldin are actively engaged in developing inhibitors in collaboration with LICR core facilities and pharmaceutical companies. The institute is currently recruiting one new PI and this brings an excellent possibility for coordinated renewal. Within the next five years, LICR and the university should start discussions about the future of the LICR operation; this unit with its expertise and excellent operational practices should not be lost in translation.

Quality of research
The quality of research is highly competitive in quality and numbers in comparison to the best international institutes, highlighted by papers in Molecular Cell, and Nature Cell Biology.

Research environment and infrastructure
LICR has functional but limited research infrastructure and is cooperating with the university. Importantly, the institute is engaged with SciLifeLab program, and further development of joint infrastructure in the university campus would be very rational and welcome. Over 50% of scientists are from abroad, and this brings along an international atmosphere, which is always beneficial in science.

Networks and collaborations
LICR is a very international institute and has, in addition to local and national collaborators, an extensive international network.

Opportunities for renewal and emerging science
Translational aspects of the projects and new recruitment bring possibilities for
renewal. Although LICR has close connections with Uppsala University groups, closer cooperation with (for example) brain tumor biology groups could be beneficial.

**Actions for successful development**
A long term plan for the future of the LICR will be needed. As of now, including LICR in the graduate student funding program would probably be a good investment by the university.

**Effects of the KoF07-evaluation**
The report recommended increased cooperation with the university, which is developing as planned. The immediate threat of closing the institute has disappeared due to the actions of the director and the high quality of the operation.

**Other issues**
Professor Heldin is gradually distancing himself from everyday science and is devoting his efforts in directing the institute and mentoring young PIs. This would be an optimal situation for any institute and makes the LICR an optimal environment for a career development of a young scientist. Uppsala University could also consider how the status of Heldin as an international science ambassador could benefit its operations.

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*Note.* The panel would like to declare that Jörg Hoheisel, one of the panel members, is partner with Ulf Landegren in two ongoing EU consortia. The level of collaboration is not such that it creates a conflict of interest, however. Moreover, Professor Heldin serves in the SAB of IMT, University of Tampere, where Olli Silvennoinen, one of the panel members, works.
Part IV: Bibliometric studies

Bibliometric Analysis of
Uppsala University

2007–2010

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Research Report to Uppsala University, Sweden

Report CWTS
Part IV: Bibliometric studies

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Appendix: Changes in the bibliometric indicators of CWTS  565
1 Introduction

The objective of the present study is to provide insight in important aspects of publication output and international citation impact of Uppsala University.

The study is based on a quantitative analysis of scientific articles published in journals and serials processed for the Web of Science (WoS) versions of the Science Citation Index and associated citation indices: the Science Citation Index (SCI) and the Social Science Citation Index (SSCI); here the CWTS database containing these records as well as enhanced citation data is briefly indicated as CI. The main focus of the study is on journal articles published during 2007–2009 and their citation impact during 2007–2010. Although we also collected articles from 2010, these are considered too recent to include in the impact analysis. The impact, as measured by citations, is compared to worldwide reference values.

Non-serial literature has not been included in the present study. Although non-serial literature might be of some importance for Uppsala University research, on an aggregate level, CI publications account for the major part of the total impact in most disciplines (see Section 3.3).

There are two main approaches to what research performance indicators should address.

(1) The ‘past performance’ approach focuses on an ex-post assessment of the past performance of a group of scientists from a perspective of accountability of research funds allocated to the research unit during a certain period. Then, retiring scientists and those formerly working in the research unit should be included.

(2) The ‘back-to-the-future’ or ‘prospective’ approach addresses the performance of the scientists who are still active in a particular research unit, from the objective of obtaining a view on the research performance of those who have the task to shape the future of this research unit. Therefore, this ex-ante approach has been called ‘back-to-the-future’. Then, it seems appropriate to exclude scientists no longer working in the research unit.

Both approaches relate to the past performance of groups of scientists. However, the policy view underlying the latter approach is more directed to the future, while the perspective adopted in the first approach is more focused on the past.

In the present study, the prospective approach has been adopted. Publication data were supplied by Uppsala University. These comprise publications authored by researchers who were employed at Uppsala University in April 2011. This means that publications are included that have been authored by recently employed researchers before their present appointment at Uppsala. At the same time, Uppsala University publications that are authored by researchers who are no longer employed at Uppsala University are not included in the present dataset.
Structure of the report

The structure of this report is as follows. The bibliometric indicators applied in this study are described in Section 2, with an overview in Section 2.4. Section 3 gives the main lines of data collection, including analyses relating to Web of Science coverage. Section 4 presents the ‘overall’ results for Uppsala University, while Section 5 provides indicators for faculties/sections and departments. Indicators for scientific collaboration are addressed in Section 6. Section 7 provides general methodological comments. Finally, Section 8 provides a summary of the main conclusions.

2 Bibliometric indicators

2.1 Introduction

Bibliometrics is the quantitative study of written products of research. It is assumed that scientific subjects develop at an international research frontier (Price, 1963). Research results are communicated in publications that are submitted to evaluation by professional colleagues. In the references of their papers, scientists acknowledge relevant publications by others, as they build on previous work. Therefore, the number of times a publication is referred to gives a partial indication of the ‘impact’ of a publication, its reception and use by scientists at the research frontier.

In nearly all scientific fields, the scientific journal is by far the most important medium of communication. The Web of Science (WoS) claims to cover the most important ‘leading’ international journals and serials (such as *Annual Reviews*) with a wellfunctioning referee system. In addition, the overall citation rate of journals is considered, as well as their timeliness of publication, and adherence to international editorial conventions. Regularly, a limited number of new journals is added, while other journals are no longer covered. More ‘peripheral’ journals, often national in scope, are usually not covered by the WoS. On an annual basis, the CWTS CI database includes about 8,000 leading international journals from all domains of scholarship.

The process of data-collection and the methodology applied in this study are comparable to those adopted in previous studies on, for instance, physics research (Rinia, 2007), biology (Nederhof & Visser, 2004), engineering (Tijssen et al., 2010), chemistry (Van Raan, 2006, 2008), the humanities (Nederhof, 2011), medicine (Moed, 2005) and the social and behavioral sciences (Nederhof, 2006, 2008). Publications were derived from a large bibliometric database of scientific publications. This database contains all scientific articles published in serials processed during the period 1980 – 2010 by the Institute for Scientific Information (ISI; now part of Thomson Reuters) for the Web of Science versions of the Science Citation Index (SCI), the Social Science Citation Index (SSCI), and the Arts & Humanities Citation Index (A&HCI). The database includes citation data on all journals processed for the SCI,
SSCI, A&HCI or CI for short. A detailed description of the main principles behind this database is given in Moed, De Bruin & Van Leeuwen (1995) and Moed (2005).

Our work is partly based upon previous work by Garfield (1979), Martin & Irvine (1983), Narin & Whitlow (1990), Van Raan (1997), and Schubert, Glänzel & Braun (1989). Both statistical requirements and imperfections in the citation process (for a discussion see Nederhof, 1988) make it desirable to aggregate across individuals, publications, and citations. Another reason for computing indicators on the oeuvre of a research unit rather than on individual papers is that within an oeuvre, later papers or review papers may draw citations that otherwise would have gone to earlier papers. The oeuvre approach prevents that such a transfer of citations within an oeuvre is treated as a statistical error in the assessment of single papers.

As scientific (sub)fields differ in publication and citation patterns (as visible in differences in, for example, length of reference lists or age of cited literature), it is usually not meaningful to compare directly the raw impact of publications from one (sub)field with those of a different (sub)field. Therefore, in our studies raw impact scores are compared to the impact of similar publications within the same subfield (see Section 2.2).

### 2.2 Output and impact indicators

We calculate several indicators for the total CI output or ‘oeuvre’ of a research unit, as produced within the time frame of the study (cf. Moed, De Bruin & Van Leeuwen, 1995, Waltman et al., 2011a).

#### Publications, citations, and citations per publication

A first statistic gives the total number of papers published by the research unit during the entire period \( P \). We considered only papers classified in the Web of Science as *normal articles, letters and reviews*. Other document types, such as meeting abstracts, book reviews, corrections, comments, ‘editorial material’ and editorials are not included. For reasons detailed below, publications classified as letters are given a weight of 0.25 while articles and reviews are given a weight of 1.

The next indicator presents the total number of citations received without self-citations \( TCS \). A self-citation (sc) to a paper is a citation given in a publication of which at least one author (either first author or co-author) is also an author of the cited paper (either first author or co-author). As an indication of the self-citation rate we present the percentage of self-citations \( Self-cits \), relative to the total number of citations (including self-citations) received.

A fourth indicator is the percentage of papers not cited during the time period considered \( Pnc \), excluding self-citations.

The fifth indicator is the mean citation score \( MCS \): the mean number of citations per publication calculated while self-citations are not included.
International reference value

Next, for each paper two international reference values are computed. A first value represents the mean citation rate of the subfield in which the paper was published. Our definition of subfields is based on a classification of scientific journals into subject categories developed by Thomson Reuters / ISI (see Section 3.3). Although this classification is certainly not perfect, it is at present the only classification available to us. The international reference value takes into account both the type of paper (e.g., normal article, review, and so on), and the specific year in which paper was processed for the Citation Index. For example, the number of citations received during the period 2007–2010 by a letter published by a research unit in 2007 in subfield X is compared to the average number of citations received during the same period (2007–2010) by all letters published in the same subfield (X) in the same year (2007).

Normalized citation scores: MNCS and MNJS

The international reference value explained above is used as the expected citation score for each paper published. The ‘crown’ indicator, the MNCS (the Mean Normalized Citation Score) relates the actual number of received citations with these expected citation scores by first calculating the ratio of actual and expected citations for each publication separately and by then taking the average of the ratios. This normalization mechanism was first proposed by Lundberg (2007). The MNCS replaces the CPP/FCSm indicator that was used by CWTS until recently and that was based on the impact of the oeuvre (CPP) rather than on the impact of individual papers (see Appendix; for a discussion about the differences between the two normalization methods see Waltman et al., 2011a and 2011b, Moed 2010). Self citations are excluded from MNCS in order to prevent that ratios are affected by divergent self-citation behavior. In this report, we include both the MNCS and CPP/FCSm values so that they can be compared.

The normalization procedure takes into account the publication date, the document type, and also the differences in the citation characteristics between subfields in which the papers are published. Therefore, MNCS can be considered as an appropriate indicator to compare the research performance of a research unit with that of other units. If the MNCS indicator is above (below) 1.0, this means that the publications of the research unit are cited on average more (less) frequently than the publications in the subfield(s) in which the research unit is active. This ‘world’ average is calculated for the total population of articles published in CI journals assigned to a particular subfield. The ‘world’ average is dominated by publications from the United States, European Union and Japan.

Similar to the procedure that is used to calculate the MNCS indicator, the impact of a journal as a whole can be compared to and normalized by the impact of the subject category to which it belongs. The MNJS (the Mean Normalized Journal Score) is the weighted average of the MNCS scores of all the jour-
Part IV: Bibliometric studies

Highly cited publications
An additional set of impact indicators reflects the contribution to the most highly cited papers worldwide. To examine the distribution of highly cited papers, we have ranked each publication on the number of citations it receives. We marked those belonging to, for example, the 5% most highly cited papers in a particular subfield in a given publication year.

The indicator $HCP_{5\%}$ denotes the absolute number of papers that are among the upper 5% of the citation distribution world-wide of similar papers regarding publication year, document type, and subfield.

$NHCP_{5\%}$ indicates the normalized proportion of highly cited papers. It relates a unit’s number of papers among the top 5% most highly cited publications to the total publication output of the unit. A value above (or below) 1 for $NHCP_{5\%}$ indicates that more (or less) than 5% of the total papers belongs to the 5% most highly cited papers.

Reliability
Due to the presence of error (Moed et al., 1995), only the first decimal of the ratios is usually reliable, given that it is based on a sufficient number of publications ($N>50$). Even for a quite large number of publications, a 5% difference or shift in the value of an indicator should not be regarded as a significant result.

2.3 Analysis of cognitive orientation
The cognitive orientation of a research unit is analyzed by classifying its papers according to scientific subfields. In the Citation Indices, publications are classified by means of the journal in which they appear into subfields such as ‘Ecology’, ‘Cell Biology’, ‘Physics, Applied’, and so on. These subfields are attached to each publication of a research unit. Subsequently, these publications are aggregated for each Web of Science subfield, and output and impact indicators are computed separately for these aggregates. The purpose of this procedure is to show how frequently a unit has published papers in various subfields of science, what the impact of the unit is in its main subfield(s), and how the impact of the unit in its main subfields of science compares to its impact in (for the unit)
more peripheral subfields of science. For a description of the (sub)fields see:
http://science.thomsonreuters.com/mjl/scope/scope_scie/
http://science.thomsonreuters.com/mjl/scope/scope_ssci/
http://science.thomsonreuters.com/mjl/scope/scope_ahci/

If a paper appears in a journal that is classified in more than one subfield, the
document (sub)fields are distributed over the subfields. Thus, a paper with 7
citations published in a journal categorized in three subfields is counted as 0.33
citations in each subfield.

For publications in each subfield, the field normalized citation impact
(MNCS) is computed, as described in Section 2.2. At the subfield level, relatively
low numbers of publications prevent frequent use of statistical tests. As
an indication, if the ratio MNCS is lower than 0.8, the impact is said to be 'low',
if the ratio is higher than 1.2, the impact is designated as 'high', while a ratio
between 0.8 and 1.2 is called 'average'.

2.4 Overview of bibliometric indicators

P The number of articles (normal articles, letters, notes and reviews)
published in journals processed for the Web of Science versions of the
Science Citation Index and the Social Science Citation Index (see
Section 2.1).

TCS The total citation score: the number of citations recorded in
Web of Science journals to all articles involved. Self-citations are excluded.

Self-cits The percentage of self-citations. A self-citation is defined as a citation in
which the citing and the cited paper have at least one author in
common (either a first author or a secondary author).

Pnc The percentage of articles not cited during the time period considered,
excluding self-citations.

MCS The average number of citations per publication. Self-citations are not
included.

MNCS The mean normalized citation score (MNCS) indicator measures the
average citation impact of a set of publications, where the citation
impact has been normalized for the fields in which the publications have
appeared. An MNCS value above (below) one means that on average
the publications have been cited more (less) frequently than would be
expected based on their fields.

CPP/FCSm Field-normalized citation impact indicator computed by comparing the
citation impact (CPP = MCS) of publications to the citation average of
similar publications in the fields in which the publications have
appeared.

MNJS The mean normalized journal score (MNJS) indicator measures the
average citation impact of the journals in which a set of publications has
appeared, where the citation impact has been normalized for the fields
to which the journals belong. An MNJS value above (below) one means
that on average the journals have been cited more (less) frequently than
would be expected based on their fields.
Part IV: Bibliometric studies

HCP 5% The number of relatively highly cited papers belonging to the upper 5% of the impact distribution of similar papers.

NHCP 5% Normalized proportion of relatively highly cited papers. An NP HCP value above (below) one means that the unit has authored more (less) highly cited publications than would be expected based on their total publication output.

3 Data collection

3.1 Levels of aggregation and time periods

Indicators are computed at the following levels of aggregation of Uppsala University scientists:

a) the total collection of all articles published by the Uppsala University scientists involved in the study (Uppsala University);

b) Faculties/Sections; and

c) Departments

Double occurrences of papers are excluded within each unit of analysis. So, one paper, labeled to two or more different research units, is counted only once on a higher level of aggregation. Similarly, a paper, co-authored by several scientists belonging to the same unit, is counted only once.

The bibliometric analysis relates to journal articles published during the period 2007–2009. Actually, these are ‘publication’ years: papers are included for the year in which they were published.

3.2 Data collection

Uppsala University provided CWTS with a list of the publications participating in the study. All relevant publications from the publication years 2007–2009 were extracted from the CWTS-CI publication database through these list. CWTS considered only papers classified in the Web of Science as normal articles, letters, and reviews, published in source serials processed for the Web of Science. Other document types, such as meeting abstracts, ‘editorials’, ‘editorial material’, corrections, comments, and book reviews were not included. A few journals are only partially processed for the Web of Science. Here, only papers processed for the Web of Science were included.

3.3 The importance of Web of Science publications for Uppsala University researchers

In order to gain insight in the importance of CI publications for Uppsala University researchers, we studied the reference lists of the Uppsala University CI papers included in the present study. These reference lists can be considered as
the knowledge base on which Uppsala University researchers build. Here, we analyze to what extent this knowledge base is covered by the Web of Science. The limitation of this approach is that only reference lists from CI publications are available while reference lists in other sources are excluded. Therefore, only a partial view can be obtained, especially in disciplines where journals are less important channels in the scholarly communication system. It should also be taken into account that the Web of Science does not attempt to cover all publications in science and in fact is selective in its coverage. It aims to capture the scholarly and scientific communication in the most important international journals.

All references in the Uppsala University CI papers (2007–2010) were matched with our extended CI publication database (1980–2010). In this way, we can estimate the importance of CI publications to Uppsala University researchers by determining to what extent they themselves cite Web of Science papers, and to what extent other, non-CI documents. Due to the extension of our database, we could only trace references dated between 1980 and 2010. Self-citations were included, as we could not exclude all self-citations for non-CI documents. Data were collected at the level of the five research units.

Table 1 includes the results. P 07–10 represents the number of CI articles, letters and reviews published between 2007 and 2010. As an illustration, we discuss the main results for Uppsala University. Uppsala University had 9,909 CI papers in 2007–2010. On average, 94% of the references in these papers was dated between 1980–2010, while 6% (the figure included in Table 1 under ‘%Refs<1980’) was not. Finally, 84% of the Uppsala University references could be matched to CI Web of Science papers. In general, these findings suggest that non-CI documents are of limited importance to Uppsala University researchers, as they account for a small minority (16%) of the references in their papers.

In all, for the faculties/sections, CI coverage was below 50% only for the Arts, Languages, and Theology Law Education. CI coverage was excellent (>80%) in the faculties/sections of Biology, Chemistry, Medicine, Pharmacy, and Physics. Furthermore, CI coverage was good (60% – 80%) in both Earth Sciences and Engineering. CI coverage was moderate (50% – 59%) in Mathematics and Computer Science and the Social Sciences, with considerable variation at the level of departments. In these faculties, non-CI documents are of some importance. CI coverage was poor elsewhere (Arts, Languages, and Theology Law Education). Here in particular, the CI publications need to be supplemented with other non-CI documents for a full monitoring of research performance. Uppsala University CI output amounted to less than 130 CI papers in these three faculties combined.
4 Overall results

4.1 Aggregated publication output and impact

Table 1 presents the overall results for the bibliometric indicators outlined in Section 2. So called ‘block indicators’ are calculated for publications during 2007–2009 and their citation impact during 2007–2010. This means that for publications from each of the publication years, citations are counted up to and including 2010. For example, a four-year citation window is used for papers published in 2007, a three-year citation window for papers published in 2008 and a two year citation window for publications from 2009. Note that several indicators, in particular the percentage of publications not cited and the percentage of self-citations, are influenced by the definition of the time-period in question. For older publications, the percentage of non-cited publications (Pnc) is usually lower, while self-citation scores are usually higher.

**Block analysis**

The block analysis shows that publications of Uppsala University researchers are cited well above the level of world reference values (MNCS, MNJS). For Uppsala University, the 7,038 publications (P) were cited 44,673 times (C) ‘externally’, i.e., by others than the authors of a publication, in 2007–2010 (see Table 2). The average paper was cited 6.3 times (MCS) after exclusion of self-citations. About 24% of the papers was not cited externally (Pnc), a relatively low percentage. The impact of the Uppsala University papers is well above international reference levels: it is 38% above the world subfield level (MNCS = 1.38). Note that the CPP/FCSm score (1.39) is almost identical. Compared to the 2002–2006 study, fieldnormalized citation impact of Uppsala University has improved from 1.25 to 1.39. Furthermore, Uppsala University researchers publish in journals with an impact-level that is 27% above the world-average (MNJS = 1.27). The percentage of self-citations (26%) for Uppsala University is not disproportionately high.

An analysis of the relatively most highly cited papers (top 5%) shows that of the articles and reviews published by Uppsala University in 2007–2009, 512 (HCP) are represented among the top 5% most highly cited of all papers similar in publication year, document type, and subfield (cf. Table 2). The latter number exceeds the expected number of top 5% papers with about 46% (NHCP), slightly up from 43% in the 2002–2006 study. This shows that Uppsala University does not only have a high field-normalized impact (MNCS), but also contributes well above average to the number of highly cited (top 5%) papers.

4.2 Cognitive orientation

Usually, scientists publish not only in journals belonging to their specialty, but also in journals outside their field. Frequently, research is multidisciplinary. An
Table 1. Internal coverage for Uppsala papers 2007–2010.

<table>
<thead>
<tr>
<th>Research Unit</th>
<th>P 07–10</th>
<th>Avg Nr Refs</th>
<th>%Refs &lt;1980</th>
<th>Nr Refs &gt;1979</th>
<th>%Refs CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uppsala</td>
<td>9,909</td>
<td>39.7</td>
<td>6%</td>
<td>371,519</td>
<td>84%</td>
</tr>
<tr>
<td>Arts</td>
<td>69</td>
<td>43.1</td>
<td>16%</td>
<td>2,496</td>
<td>30%</td>
</tr>
<tr>
<td>511 Dept For Gender Research</td>
<td>10</td>
<td>37.9</td>
<td>6%</td>
<td>358</td>
<td>34%</td>
</tr>
<tr>
<td>512 Dept of Archaeology and Ancient History</td>
<td>14</td>
<td>49.6</td>
<td>14%</td>
<td>595</td>
<td>43%</td>
</tr>
<tr>
<td>517 Dept of Philosophy</td>
<td>14</td>
<td>31.3</td>
<td>25%</td>
<td>327</td>
<td>32%</td>
</tr>
<tr>
<td>518 Dept of History</td>
<td>10</td>
<td>42.9</td>
<td>28%</td>
<td>308</td>
<td>16%</td>
</tr>
<tr>
<td>519 Dept of History of Science and Ideas</td>
<td>7</td>
<td>44.6</td>
<td>20%</td>
<td>251</td>
<td>14%</td>
</tr>
<tr>
<td>520 Dept of Art History</td>
<td>1</td>
<td>31.0</td>
<td>39%</td>
<td>19</td>
<td>0%</td>
</tr>
<tr>
<td>521 Dept of Cultural Anthropology and Ethnology</td>
<td>2</td>
<td>54.0</td>
<td>6%</td>
<td>101</td>
<td>27%</td>
</tr>
<tr>
<td>522 Dept of History of Science and Ideas</td>
<td>4</td>
<td>43.0</td>
<td>16%</td>
<td>145</td>
<td>8%</td>
</tr>
<tr>
<td>523 Dept of Musicology</td>
<td>1</td>
<td>8.0</td>
<td>88%</td>
<td>1</td>
<td>0%</td>
</tr>
<tr>
<td>527 Dept of ALM</td>
<td>7</td>
<td>71.6</td>
<td>6%</td>
<td>473</td>
<td>36%</td>
</tr>
<tr>
<td>529 The Hugo Valentin Centre</td>
<td>4</td>
<td>43.0</td>
<td>16%</td>
<td>145</td>
<td>8%</td>
</tr>
<tr>
<td>Faculty of Sciences and Technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biology</td>
<td>1,063</td>
<td>50.4</td>
<td>6%</td>
<td>50,545</td>
<td>88%</td>
</tr>
<tr>
<td>146 Dept of Ecology and Genetics</td>
<td>481</td>
<td>53.4</td>
<td>6%</td>
<td>24,200</td>
<td>85%</td>
</tr>
<tr>
<td>148 Dept of Organismal Biology</td>
<td>240</td>
<td>49.3</td>
<td>8%</td>
<td>10,943</td>
<td>87%</td>
</tr>
<tr>
<td>152 Dept of Cell and Molecular Biology</td>
<td>354</td>
<td>47.4</td>
<td>4%</td>
<td>16,055</td>
<td>94%</td>
</tr>
<tr>
<td>Chemistry</td>
<td>727</td>
<td>41.7</td>
<td>5%</td>
<td>28,710</td>
<td>91%</td>
</tr>
<tr>
<td>131 Dept of Biochemistry and Organic Chemistry</td>
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<td>6%</td>
<td>8,699</td>
<td>91%</td>
</tr>
<tr>
<td>133 Dept of Photo Chemistry and Mol. Science</td>
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<td>5%</td>
<td>5,753</td>
<td>93%</td>
</tr>
<tr>
<td>135 Dept of Physical and Analytical Chemistry</td>
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<td>4%</td>
<td>8,487</td>
<td>92%</td>
</tr>
<tr>
<td>137 Dept of Materials Chemistry</td>
<td>207</td>
<td>35.2</td>
<td>7%</td>
<td>6,777</td>
<td>90%</td>
</tr>
<tr>
<td>Earth Sciences</td>
<td>496</td>
<td>48.9</td>
<td>11%</td>
<td>21,544</td>
<td>70%</td>
</tr>
<tr>
<td>Engineering</td>
<td>618</td>
<td>30.0</td>
<td>8%</td>
<td>17,139</td>
<td>77%</td>
</tr>
<tr>
<td>Mathematics and Computer Science</td>
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<td>26.3</td>
<td>11%</td>
<td>9,366</td>
<td>59%</td>
</tr>
<tr>
<td>104 Dept of Mathematics</td>
<td>163</td>
<td>24.4</td>
<td>16%</td>
<td>3,336</td>
<td>60%</td>
</tr>
<tr>
<td>106 Dept of Information Technology</td>
<td>238</td>
<td>27.6</td>
<td>7%</td>
<td>6,079</td>
<td>58%</td>
</tr>
<tr>
<td>Physics</td>
<td>1,160</td>
<td>36.2</td>
<td>9%</td>
<td>38,375</td>
<td>84%</td>
</tr>
<tr>
<td>Languages</td>
<td>35</td>
<td>37.0</td>
<td>18%</td>
<td>1,060</td>
<td>15%</td>
</tr>
<tr>
<td>532 Dept of English</td>
<td>13</td>
<td>32.2</td>
<td>30%</td>
<td>292</td>
<td>4%</td>
</tr>
<tr>
<td>543 Dept of Linguistics and Philology</td>
<td>9</td>
<td>51.0</td>
<td>11%</td>
<td>409</td>
<td>15%</td>
</tr>
<tr>
<td>545 Dept of Modern Languages</td>
<td>13</td>
<td>32.1</td>
<td>14%</td>
<td>359</td>
<td>25%</td>
</tr>
<tr>
<td>Medicine</td>
<td>4,655</td>
<td>37.8</td>
<td>3%</td>
<td>170,641</td>
<td>90%</td>
</tr>
<tr>
<td>460 Dept of Public Health and Caring Sciences</td>
<td>639</td>
<td>36.9</td>
<td>2%</td>
<td>22,995</td>
<td>82%</td>
</tr>
<tr>
<td>462 Dept of Immunology, Genetics and Pathology</td>
<td>577</td>
<td>38.2</td>
<td>3%</td>
<td>21,493</td>
<td>95%</td>
</tr>
<tr>
<td>463 Dept of Surgical Sciences</td>
<td>770</td>
<td>35.2</td>
<td>4%</td>
<td>25,974</td>
<td>89%</td>
</tr>
<tr>
<td>464 Dept of Womens and Childrens Health</td>
<td>540</td>
<td>33.7</td>
<td>3%</td>
<td>17,599</td>
<td>84%</td>
</tr>
<tr>
<td>465 Dept of Medical Biochem. and Microbiology</td>
<td>303</td>
<td>49.9</td>
<td>4%</td>
<td>14,526</td>
<td>96%</td>
</tr>
<tr>
<td>466 Dept of Medical Cell Biology</td>
<td>163</td>
<td>43.3</td>
<td>3%</td>
<td>6,746</td>
<td>97%</td>
</tr>
<tr>
<td>467 Dept of Medical Sciences</td>
<td>1,515</td>
<td>36.0</td>
<td>2%</td>
<td>53,176</td>
<td>91%</td>
</tr>
<tr>
<td>468 Dept of Neuroscience</td>
<td>585</td>
<td>40.3</td>
<td>4%</td>
<td>22,685</td>
<td>90%</td>
</tr>
<tr>
<td>469 Dept of Radiology, Oncol. and Rad. Science</td>
<td>454</td>
<td>36.3</td>
<td>2%</td>
<td>16,173</td>
<td>92%</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>594</td>
<td>45.2</td>
<td>4%</td>
<td>25,670</td>
<td>91%</td>
</tr>
<tr>
<td>451 Dept of Medicinal Chemistry</td>
<td>129</td>
<td>48.3</td>
<td>4%</td>
<td>5,974</td>
<td>93%</td>
</tr>
<tr>
<td>452 Dept of Pharmaceutical Biosciences</td>
<td>322</td>
<td>42.9</td>
<td>4%</td>
<td>13,257</td>
<td>90%</td>
</tr>
<tr>
<td>453 Dept of Pharmacy</td>
<td>154</td>
<td>47.4</td>
<td>5%</td>
<td>6,903</td>
<td>92%</td>
</tr>
</tbody>
</table>
analysis of the publication output according to CI subfields shows in which subfields research units are cited above or below the world subfield average (MNCS). One should keep in mind that a CI subfield, for example ‘Ecology’, refers only to a combination of journals, and not to an institutional or departmental affiliation. As a consequence, it is not unusual that publications in one subfield have been contributed by members from several research units.

The main findings are as follows. First, we look at the output per subfield in 2007–2009 (see Figure 1). Data are included for the subfields accounting for at

Table 1. Internal coverage for Uppsala papers 2007–2010, cont.

<table>
<thead>
<tr>
<th>Research Unit</th>
<th>P 07–10</th>
<th>Avg Nr Refs</th>
<th>%Refs &lt;1980</th>
<th>Nr Refs &gt;1979</th>
<th>%Refs CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Sciences</td>
<td>523</td>
<td>46.9</td>
<td>7%</td>
<td>22,829</td>
<td>55%</td>
</tr>
<tr>
<td>212 Dept of Economic History</td>
<td>5</td>
<td>40.0</td>
<td>22%</td>
<td>156</td>
<td>37%</td>
</tr>
<tr>
<td>213 Dept of Peace and Conflict Research</td>
<td>41</td>
<td>48.5</td>
<td>3%</td>
<td>1,920</td>
<td>40%</td>
</tr>
<tr>
<td>214 Dept of Business Studies</td>
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<td>77.5</td>
<td>7%</td>
<td>2,386</td>
<td>54%</td>
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<td>216 Dept of Social and Economic Geography</td>
<td>38</td>
<td>58.2</td>
<td>8%</td>
<td>2,030</td>
<td>40%</td>
</tr>
<tr>
<td>217 Dept of Economics</td>
<td>74</td>
<td>31.8</td>
<td>9%</td>
<td>2,134</td>
<td>56%</td>
</tr>
<tr>
<td>218 Dept of Education</td>
<td>17</td>
<td>42.2</td>
<td>7%</td>
<td>667</td>
<td>32%</td>
</tr>
<tr>
<td>220 Dept of Sociology</td>
<td>20</td>
<td>50.8</td>
<td>10%</td>
<td>913</td>
<td>26%</td>
</tr>
<tr>
<td>221 Dept of Statistics</td>
<td>14</td>
<td>29.7</td>
<td>9%</td>
<td>378</td>
<td>69%</td>
</tr>
<tr>
<td>222 Dept of Government</td>
<td>35</td>
<td>48.4</td>
<td>5%</td>
<td>1,601</td>
<td>38%</td>
</tr>
<tr>
<td>225 Dept of Food, Nutrition and Dietetics</td>
<td>17</td>
<td>36.5</td>
<td>3%</td>
<td>600</td>
<td>71%</td>
</tr>
<tr>
<td>226 Dept of Psychology</td>
<td>174</td>
<td>46.8</td>
<td>7%</td>
<td>7,576</td>
<td>75%</td>
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<tr>
<td>227 Dept of Informatics and Media</td>
<td>22</td>
<td>43.5</td>
<td>6%</td>
<td>901</td>
<td>37%</td>
</tr>
<tr>
<td>234 Centre for Russian and Eurasian Studies</td>
<td>4</td>
<td>47.5</td>
<td>25%</td>
<td>143</td>
<td>23%</td>
</tr>
<tr>
<td>235 Institute For Housing and Urban Studies</td>
<td>39</td>
<td>47.9</td>
<td>5%</td>
<td>1,772</td>
<td>51%</td>
</tr>
<tr>
<td>Theology Law Education</td>
<td>25</td>
<td>37.1</td>
<td>12%</td>
<td>820</td>
<td>31%</td>
</tr>
<tr>
<td>251 Dept of Law</td>
<td>5</td>
<td>32.6</td>
<td>18%</td>
<td>134</td>
<td>25%</td>
</tr>
<tr>
<td>266 Dept of Curriculum Studies</td>
<td>7</td>
<td>52.0</td>
<td>10%</td>
<td>329</td>
<td>29%</td>
</tr>
<tr>
<td>267 Dept of Studies in Educ., Culture and Media</td>
<td>3</td>
<td>22.0</td>
<td>38%</td>
<td>41</td>
<td>0%</td>
</tr>
<tr>
<td>551 Dept of Theology</td>
<td>10</td>
<td>33.4</td>
<td>5%</td>
<td>316</td>
<td>39%</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Description</th>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of publications</td>
<td>$P$</td>
<td>7,038</td>
</tr>
<tr>
<td>Total Citation Score</td>
<td>TCS</td>
<td>44,673</td>
</tr>
<tr>
<td>Percentage Self citations</td>
<td>Self cits</td>
<td>26%</td>
</tr>
<tr>
<td>Percentage publications non cited</td>
<td>Pnc</td>
<td>24%</td>
</tr>
<tr>
<td>Mean Citation Score</td>
<td>MCS</td>
<td>6.35</td>
</tr>
<tr>
<td>Mean Normalized Citation Score</td>
<td>MNCS</td>
<td>1.38</td>
</tr>
<tr>
<td>Mean Normalized Journal Score</td>
<td>MNJS</td>
<td>1.27</td>
</tr>
<tr>
<td>Number of Highly Cited Papers (Top 5%)</td>
<td>HCP 5%</td>
<td>512</td>
</tr>
<tr>
<td>Normalized Proportion of Highly Cited Papers</td>
<td>NP HCP 5%</td>
<td>1.46</td>
</tr>
<tr>
<td>Citations per publication compared to citation rate of subfields</td>
<td>CPP/FCSm</td>
<td>1.39</td>
</tr>
</tbody>
</table>
least 1% of the publication total. ‘Biochemistry & Molecular Biology’ is clearly
the most important subfield for Uppsala University researchers in terms of out-
put, including 4% of the publications, followed by ‘Oncology’ with nearly 4%.
Four other subfields account each for nearly 3% of the publications: ‘Physics,
Condensed Matter’, ‘Pharmacology & Pharmacy’, ‘Endocrinology & Metabo-
lism’ and ‘Genetics & Heredity’.

<table>
<thead>
<tr>
<th>SUB FIELD (MNCS)</th>
<th>UPPSALA UNIVERSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOCHEM&amp;MOLE BIOL (1.18)</td>
<td></td>
</tr>
<tr>
<td>ONCOLOGY (1.20)</td>
<td></td>
</tr>
<tr>
<td>PHYSICS,COND.MAT (1.18)</td>
<td></td>
</tr>
<tr>
<td>PHARMACOL&amp;PHARMA (1.28)</td>
<td></td>
</tr>
<tr>
<td>ENDOCRIN&amp;METABOL (1.08)</td>
<td></td>
</tr>
<tr>
<td>GENETICS&amp;HEREDIF (1.84)</td>
<td></td>
</tr>
<tr>
<td>NEUROSCIENCES (1.05)</td>
<td></td>
</tr>
<tr>
<td>PHYSICS,APPLIED (1.30)</td>
<td></td>
</tr>
<tr>
<td>PUBL ENV OCC HLTH (1.16)</td>
<td></td>
</tr>
<tr>
<td>SURGERY (1.73)</td>
<td></td>
</tr>
<tr>
<td>PHYSICS,MULTIDIS (1.13)</td>
<td></td>
</tr>
<tr>
<td>CARD&amp;CARDIOV SYST (2.56)</td>
<td></td>
</tr>
<tr>
<td>CHEM,PHYSICAL (1.65)</td>
<td></td>
</tr>
<tr>
<td>ASTRON&amp;ASTROPH (1.13)</td>
<td></td>
</tr>
<tr>
<td>MULTIDISCIPL, SC (2.22)</td>
<td></td>
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<tr>
<td>ENG,ELC&amp;ELECTR (1.60)</td>
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</tr>
<tr>
<td>MEDICINE,GEN&amp;INT (5.92)</td>
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<tr>
<td>CLIN NEUROLOGY (1.32)</td>
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</tr>
<tr>
<td>MATER SC,MULTID (1.25)</td>
<td></td>
</tr>
<tr>
<td>BIOCHEM RES METH (1.29)</td>
<td></td>
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<tr>
<td>GEOSC,MULTIDISC (1.49)</td>
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<tr>
<td>PERIPH VASC DIS (1.53)</td>
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<td>ECOLOGY (1.45)</td>
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<td>RAD,NUCL MED IM (1.21)</td>
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<td>HEMATOLOGY (2.13)</td>
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<td>PHYSICS,AT MO CH (1.26)</td>
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<td>CELL BIOLOGY (1.17)</td>
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<td>PEDIATRICS (1.19)</td>
<td></td>
</tr>
<tr>
<td>OBSTETRICS&amp;GYNEC (1.20)</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 1. Research profile: Publications and impact per subfield 2007–2009 Uppsala University.**

*LOW – MNCS < 0.8; AVERAGE – MNCS > 0.8*
In Figure 1, field-normalized (MNCS) scores are shown between parentheses behind each subfield. The impact of Uppsala University researchers is competitive with the world average in the top output subfields ‘Biochemistry & Molecular Biology’ and ‘Physics, Condensed Matter’, but high in ‘Oncology’ and ‘Pharmacology & Pharmacy’, as well as in many of its major subfields. Impact is below average in none of the subfields. Citation impact is very high (MNCS >2) in ‘Multidisciplinary Sciences’ (a broad subfield that covers general science journals such as *Nature* and *Science*) and in three medical subfields: ‘Cardiac & Cardiovascular Systems’, ‘Medicine, General & Internal’ and ‘Hematology’.

5 Indicators for faculties and departments

5.1 Block indicators for faculties/sections

We present block indicators for Uppsala University faculties/sections during 2007–2010 in Table 3. Due to the small number of CI papers, detailed results have not been computed for the faculties of Theology, Law, Arts, Languages, and Educational Sciences. In general, units with less than 20 CI papers have not been included.

Focusing on the field-normalized citation impact (MNCS) during 2007–2010, Table 3 shows that the field-normalized impact of five out of ten faculties/sections (indicated in bold) is at least 20% above average (20% – 71% above average). Four other faculties/sections have a moderately above average impact (14% – 18%). Finally, one faculty has an impact that is competitive with the world average. In general, this compares well with the findings of the 2002–2006 study, that counted six faculties/sections with 17% – 36% above average scores, and three with competitive with the world average scores.

In three cases, the 2007–2010 CPP/FCSm indicator scores are 0.11–0.12 lower than the corresponding MNCS values, while for the other faculties/sections differences are small. Differential weighing of citation scores of the more recent papers is one factor that may have contributed to the differences between MNCS and CPP/FCSm scores (see Appendix).

Focusing on the citation level of journals (MNJS) during 2007–2010, Table 3 shows that seven faculties/sections publish in journals with an at least 20% above average impact. Two other faculties tend to publish in journals with a moderately above average impact (14% – 17%). Finally, one faculty publishes in journals with an impact that is competitive with the world average in its subfields.

All but two of the ten faculties/sections exceed the expected number of top 5% most highly cited papers (NHCP). Differences are robust for Biology, Medicine and the Faculty of Sciences and Technology. In particular, Biology does well with more than twice the expected number of top 5% papers. Each of the ten faculties/sections contributed at least eighteen top 5% papers (see under HCP).
Figure 2 compares the actual number of highly cited papers at the top 5% level (HCP) with the ratio between actual and expected top 5% papers (NHCP) for the ten largest Uppsala University faculties/sections. A NHCP ratio above 1 indicates that more top 5% papers are produced than expected on the basis of output. In 2007–2009, all but three faculties/sections produced between 18
and 40 top 5% papers. Only the Faculty of Medicine, the Faculty of Sciences and Technology, and the Section of Biology produced considerably more.

In general, the ratio of top 5% papers was close to the field-normalized citation impact (MNCS). It is not very surprising that the high field-normalized impact of Biology is associated with a high ratio of top 5% papers. In general,
the top 5% indicator shows that faculties/sections do not only do well on their average field-normalized impact (CPP/FCSm), but also contribute above average to the top-end of research in their subfields.

5.2 A survey of output and impact results for departments

We made an analysis of the relation between output (in terms of CI-publications) and citation impact on the level of departments (as noted in Section 5.1, departments in Theology, Law, Arts, Languages, and Educational Sciences are not included, nor are other units with less than 20 publications). Figure 3 combines output figures for 2007–2009 (P) and field-normalized impact results (MNCS) for 2007–2010. Departments have been labeled with their faculty name. Detailed findings are presented in Table 3.
Nineteen departments are cited at least 20% above the world subfield average (MNCS), whereas one department (Economics) is cited at least 20% below average. Seven out of twelve units producing more than 300 papers are cited at least 50% above average.

The distribution visible in Figure 3 matches to some extent a well-known pattern. The pattern that we encounter frequently in our studies is that extreme citation impact scores are mainly found among the research units with a relatively low output, while the citation impact scores of the research units with the largest outputs are somewhat closer to the world subfield average. Partly, this pattern is due to the statistical fact that error tends to be larger among units with fewer observations than among those with a larger number of observations.
6 Indicators of scientific collaboration

Three types of scientific collaboration were distinguished (see Section 2.4). Publications with only one address were assigned to 'single group'. Publications with multiple addresses, all from the same country, were assigned to 'national collaboration'. Finally, all publications with at least one address outside Sweden were marked with the collaboration type 'international'.

Figure 4 shows the percentage of the total output (P) represented by each of the three types of collaboration for Uppsala University and its major faculties/sections during 2007–2009. It has been indicated whether the field-normalized citation impact (MNCS) is ‘relatively low’ (<0.80), ‘average’ (0.80–1.20) or ‘relatively high’ (>1.20).

Figure 4 shows the importance of collaboration for Uppsala University researchers: ‘internally’ produced ‘single group’ publications represent only 19% of the total output. Both national and in particular international collaboration are of considerable importance. For Uppsala University, publications stemming from international collaboration are cited highly and more often than those produced in the own Faculty or in national cooperation. However, Figure 4 shows that several faculties have somewhat divergent signatures in scientific collaboration.

The results show that Uppsala University researchers tend to contribute substantially to international scientific networks, and that many receive an important part of their impact from publications that are internationally co-authored.

7 General comments and discussion

A few general comments can be made on the use of bibliometric indicators for the assessment of research performance. It is our experience in previous bibliometric studies on research performance in the natural and life sciences, medicine, the humanities, and the social and behavioral sciences, that bibliometric indicators provide useful information to a peer group evaluating research performance. These studies revealed a fair correspondence between the results of bibliometric analyses on the one hand, and judgements on scientific quality by peers on the other hand. In our view, a quality judgement on a research unit or department can only be given by peers, based on a detailed insight into content and nature of the research conducted by the group or department in question. The citation-based indicators applied in this study measure the impact at the short or medium term of research activities at the international research frontier, as reflected in publication and citation patterns. Impact and scientific quality are by no means identical concepts. Nor are impact and utility of research to users in society (Nederhof & Meijer, 1995).
Part IV: Bibliometric studies

Bibliometric indicators cannot be interpreted properly without background knowledge on both the research units or programs that are evaluated and the subfields in which the research units are active. In previous studies we have encountered a few cases in which a bibliometric indicator pointed in one direction (e.g., a low impact), while statements by peers or even other indicators pointed in another direction (e.g., a high quality). Analyzing such discrepancies from a bibliometric point of view, specific limitations related to the bibliometric methodology applied in the study in question may be identified. While in most cases such limitations do hardly affect the results or have no effect at all, in exceptional cases the bibliometric outcomes may provide an incomplete or even distorted picture. For instance, the classification of journals into subfields

Figure 4. Impact analysis for types of collaboration 2007–2009; Uppsala University and Faculties (upper part), Sections within the Faculty of Science and Technology (lower part).
may be less appropriate for some research units, particularly when they are active in topics of a multidisciplinary nature. In particular, this latter case pertains to fast-developing novel interdisciplinary fields. Then, in the calculation of the impact compared to the world subfield citation average, this world average may not be representative for the subfield in which such a research unit is active.

A second limitation concerns the coverage of the Citation Indices (CI). In specific subfields, particularly in applied or technical sciences, the CI coverage may be less adequate. For a number of research units, valuable additional information may be obtained by retrieving impact data for non-CI publications (e.g., articles in journals that are not or no longer covered by CI). In the present study, CI papers account for 84% of the references in Uppsala University papers. This provides support for the use of CI papers as the basis of a citation analysis.

Another example of a limitation of bibliometric analysis relates to time delays. It may take several years for a collection of papers to generate a high impact. We have analyzed research units that generated only a moderate impact at the time. When we updated the results after a few years, several research units showed a sharply rising impact curve.

We emphasize that our study does not represent a complete overview of the bibliometric past performance of research units. The presently used approach focuses on the publications from 2007–2009 (cf. Section 1). Outside these periods, significant work may have been produced that is not included in the present analyses. In the ‘prospective’ approach adopted in this study, all publications of researchers (including those without a Uppsala University address) have been assigned to the research unit to which they are affiliated recently, rather than the research unit to which they were previously affiliated (see Section 1), and publications were excluded of retirees and of researchers no longer present. Also, relevant work of junior scientists publishing without their mentor may not always have been included.

In the interpretation of the figures, it should be taken into account that even with a quite high number of publications, a difference of 5% should not be taken as a statistically significant result. Results involving lower levels of aggregation, such as team-leaders, are subject to a higher degree of uncertainty.

Scientists or units may have previously participated in one of our bibliometric studies. In some cases, different results are obtained. Reasons for differences between the present study and a previous one include changes in (status of) participating scientists, differences in publications that are included, and a difference in the period during which citations are collected.

8 Main findings and conclusions

In this study, the research performance of Uppsala University researchers during 2007–2009 (publication output) and 2007–2010 (citation impact) has been compared with a number of international reference values. The citation impact
of the Uppsala University papers is significantly above international reference levels: field-normalized impact is 38% above the world average while Uppsala University researchers publish in journals with an impact-level that is 27% above the world-average.

The citation impact of Uppsala University researchers is competitive with the world average in its top output subfields ‘Biochemistry & Molecular Biology’, ‘Physics, Condensed Matter’, and ‘Endocrinology & Metabolism’, while it is well above average in ‘Oncology’, ‘Pharmacology & Pharmacy’, ‘Genetics & Heredity’ as well as in many of its other major subfields. Impact is below average in none of its major subfields. Citation impact is very high in ‘Multidisciplinary Sciences’ (a broad subfield that covers general science journals such as *Nature* and *Science*), ‘Cardiac & Cardiovascular Systems’, ‘Medicine, General & Internal’ and ‘Hematology’.

The field-normalized impact of five faculties/sections (indicated in bold) is at least 20% above average, while four faculties/sections have a moderately above average impact (14% – 18%). One faculty has an impact that is competitive with the world average. Nineteen departments are cited at least 20% above the world subfield average (MNCS), whereas only one is cited more than 20% below average.

Among the top 5% most highly cited papers in their subfields, Uppsala University papers occur about 46% more often than expected. All but two of the ten faculties/sections exceed the expected number of top 5% most highly cited papers (NHCP). Differences are robust for Biology, Medicine and the Faculty of Sciences and Technology. In particular, Biology does well with more than twice the expected number of top 5% papers. Each of the ten faculties/sections contributed at least eighteen top 5% papers. These findings show that the well above average field-normalized impact score of Uppsala University papers is not due to a few exceptional papers. Uppsala University produced well over 500 top 5% papers in all.

Finally, Uppsala University researchers contribute substantially to international scientific networks, and many receive a sizeable part of their impact from publications that are internationally coauthored.

References


Moed, H.F., 2005. *Citation Analysis in Research Evaluation*. Dordrecht: Springer.


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Part IV: Bibliometric studies


Appendix: Changes in the bibliometric indicators of CWTS

Introduction
This appendix provides a short summary of the changes in the bibliometric indicators of CWTS. These changes are the result of internal discussions within CWTS and also of recent insights in the bibliometric literature. The emphasis in this report is on the CPP/FCSm indicator and the MNCS indicator. For a long time, CWTS has been using the CPP/FCSm indicator, but this indicator is going to be replaced by the MNCS indicator. Both indicators will be discussed and the advantages and disadvantages of the MNCS indicator compared with the CPP/FCSm indicator will be summarized. Some other changes in the bibliometric indicators of CWTS will be mentioned briefly.

CWTS is well aware of the importance of continuity in the use of bibliometric indicators. For this reason, the new indicators will sometimes be used together with the old ones in studies of CWTS. When necessary, the new indicators will also be calculated retroactively.

Definitions of the CPP/FCSm indicator and the MNCS indicator
The CPP/FCSm (citations per publication / mean field citation score) indicator is defined as

\[ \text{CPP/FCSm} = \frac{(c_1 + c_2 + \ldots + c_n)/n}{(e_1 + e_2 + \ldots + e_n)/n}, \]

where \( n \) denotes the number of publications, \( c_i \) denotes the actual number of citations of publication \( i \), and \( e_i \) denotes the expected number of citations of publication \( i \). The expected number of citations of a publication is given by the average number of citations of all publications that appeared in the same field and the same year and that have the same document type (article, letter, or review).

The MNCS (mean normalized citation score) indicator is defined as

\[ \text{MNCS} = \frac{1}{n} \left( \frac{c_1 + c_2 + \ldots + c_n}{e_1 + e_2 + \ldots + e_n} \right). \]

As can be seen from the above formulas, the essential difference between the CPP/FCSm indicator and the MNCS indicator is that the former indicator is defined as a ratio of averages while the latter indicator is defined as an average of ratios.

The following example illustrates the calculation of both indicators. Suppose there are three publications, and suppose these publications have the following characteristics:

<table>
<thead>
<tr>
<th>Publication</th>
<th>Field</th>
<th>Publication year</th>
<th>Actual citations</th>
<th>Expected citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Psychiatry</td>
<td>2005</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Surgery</td>
<td>2005</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Surgery</td>
<td>2008</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

This yields the following indicators:

\[ \text{CPP/FCSm} = \frac{(25 + 20 + 15)/3}{(10 + 20 + 5)/3} = 1.71, \]

\[ \text{MNCS} = \frac{1}{3} \left( \frac{25}{10} + \frac{20}{20} + \frac{15}{5} \right) = 2.17. \]
Advantages and disadvantages of the MNCS indicator

The MNCS indicator has two important advantages compared with the CPP/FCSm indicator:

- All publications have equal weight in the MNCS indicator, while in the CPP/FCSm indicator older publications and publications from fields with a lot of citation traffic have more weight.
- The MNCS indicator is consistent, while the CPP/FCSm indicator is not. Consistency means that the way in which researchers, departments, or universities are being ranked satisfies certain logical conditions.

The MNCS indicator has two disadvantages compared with the CPP/FCSm indicator:

- The MNCS indicator can be very sensitive to citations to recent publications.
- Publications of the document type letter need to be treated in a special way in the MNCS indicator.

These advantages and disadvantages are discussed in more detail below.

Equal weighing of publications in the MNCS indicator

Older publications and publications from fields with a lot of citation traffic on average have a relatively large number of citations. These publications also have a large expected number of citations. In the numerator of the CPP/FCSm indicator, citations to publications from different fields and different publication years are added together. In the denominator, the same is done with expected citations. This causes older publications and publications from fields with a lot of citation traffic to have a relatively high weight in the CPP/FCSm indicator. In the MNCS indicator, the number of citations of a publication is compared directly with the expected number of citations of the publication, without first aggregating over publications. In this way, all publications have equal weight in the indicator. CWTS regards equal weighing of publications from different fields and different publication years as the most natural way to determine the citation score of a set of publications.

The numerical example given in the previous section illustrates the difference between the CPP/FCSm indicator and the MNCS indicator. In this example, publications 1 and 3 have many more citations than expected. Publication 2 has exactly the expected number of citations. Publication 2 originates from a field in which there is much more citation traffic than in the field of publication 1. Furthermore, publication 2 is much older than publication 3. For these reasons, publication 2 has a larger expected number of citations than publications 1 and 3, and consequently publication 2 has more weight in the CPP/FCSm indicator. Since publication 2 has a lower citation impact than publications 1 and 3 (after correcting for field and publication year), giving more weight to this publication leads to a lower citation score. This explains why the MNCS indicator, which gives equal weight to all publications, yields a higher citation score than the CPP/FCSm indicator.

Consistency of the MNCS indicator

Suppose there are two universities (or departments or researchers), A and B, which have the same number of publications. Suppose the citation score of A exceeds the citation score of B. Suppose next that A and B jointly produce a new publication. Since it is a joint publication and, consequently, A and B make the same improvement, it is natural to expect that with the new publication included the citation score of A still exceeds the one of B. An indicator that guarantees this is called consistent. The CPP/FCSm indicator is not consistent. In certain cases, the way in which this indicator ranks two units relative to each other changes in a counter-intuitive manner. The MNCS indicator is consistent and therefore does not have this problem.
Sensitivity of the MNCS indicator to citations to recent publications

Recent publications have a small expected number of citations. In some cases, a relatively small number of citations to a recent publication can therefore be sufficient to get a high value for the ratio of the actual and the expected number of citations of the publication. For this reason, the MNCS indicator can be very sensitive to citations to recent publications. In some cases, this sensitivity may cause the MNCS indicator to provide a distorted picture of the citation score of a set of publications.

CWTS has two ways of dealing with this disadvantage of the MNCS indicator. First, CWTS calculates the MNCS indicator only for publications that have had at least one year to earn citations. In this way, the expected number of citations of a publication will never be very small, and the sensitivity of the MNCS indicator to citations to recent publications will therefore be limited. Second, confidence intervals can be added to the MNCS indicator. When the MNCS indicator is heavily influenced by citations to recent publications, this will translate into wide confidence intervals.

Special treatment of publications of the document type letter in the MNCS indicator

The general idea of the MNCS indicator is that all publications should have equal weight. However, in the case of publications of the document type letter, this principle is difficult to justify. In general, it does not seem fair to give the same weight to a letter as to an article or review. Moreover, since letters often have a small expected number of citations, this would cause the MNCS indicator to be highly sensitive to citations to letters. For these reasons, letters need to be treated in a special way in the MNCS indicator. CWTS chooses to give letters a weight of 0.25 in the MNCS indicator. To illustrate this, let’s consider the numerical example given earlier. If publication 3 in this example is of the document type letter, the MNCS indicator is calculated as

\[
\text{MNCS} = \frac{1}{2.25} \left( \frac{25}{10} + \frac{20}{20} + 0.25 \times \frac{15}{5} \right) = 1.89.
\]

Practical differences between the CPP/FCSm indicator and the MNCS indicator

CWTS has extensively investigated how the CPP/FCSm indicator and the MNCS indicator differ from each other in practice. At the level of universities or large parts of universities (e.g., large faculties), differences are typically small. Differences of more than five percent are highly exceptional at this level. At the level of departments or research groups, differences are somewhat larger. Although at this level the CPP/FCSm indicator and the MNCS indicator are correlated strongly too, differences up to twenty percent are not exceptional. The main cause of differences seems to be that the MNCS indicator gives more weight to recent publications than the CPP/FCSm indicator.

Other changes in the bibliometric indicators of CWTS

In addition to the change from the CPP/FCSm indicator to the MNCS indicator, several other changes are going to take place in the bibliometric indicators of CWTS. Important changes are:

- The JCSm/FCSm (mean journal citation score / mean field citation score) indicator, which indicates the average citation score of the journals in which one has published is replaced by the MNJS (mean normalized journal score) indicator.
- The CPP/JCSm (citations per publication / mean journal citation score) indicator, which indicates the journal-normalized citation score of a set of publications is no longer be used. It may be replaced by an indicator that is based on similar principles as the MNCS and MNJS indicators.
Bibliometric analysis of the Disciplinary Domain of Humanities and Social Sciences using the national Norwegian model for research performance

by Leif Eriksson

Introduction

The KoF07 evaluation included a bibliometric study based on citation analysis using Web of Science. This was done as a separate exercise in order not to integrate it with the peer-review evaluation, since the applicability of this method for certain areas of research is limited. The internal evaluation of the KoF07 report not surprisingly exposed discontentment from some researchers from the humanities and social sciences disciplines with the bibliometric method being used (Eriksson and Sjölund 2010). Since the citation analysis only takes into account articles and reviews from journals that are represented in Web of Science, a great deal of the publication activity from these disciplines is excluded.

An analysis of the publication activity from the humanities and social sciences between 2007 and 2010 shows that articles in journals only contribute 40% of the total output and that articles from journals that are covered in Web of Science only contribute 9% (see Figure 1). Other publication channels as monographs and articles in anthologies etc. contribute 30% of the total output although there is considerable diversity within the disciplinary domain; in some departments, like the Department of Economic History and the Department of Literature, the share is about 60–70%.

Figure 1. Proportion of publication types from the Disciplinary Domain of Humanities and Social Sciences in Uppsala University 2007–2010
Method

The national Norwegian model offers an extended bibliometric analysis by including monographs and articles in anthologies as well as journal and review articles. The model focuses on the publication channel (i.e. journals and publishers) rather than individual publications. Journals and publishers are classified in three levels, level 0 (non-scientific), level 1 (normal) and level 2 (prestigious). Publications in the two latter categories are regarded as scientific publications, and the relative proportion of publications in each of these categories is used as an indicator of research performance (Schneider 2009).

However, one has to bear in mind that it is only the frequency of channels (journals and publishers) used that is being evaluated in the model and not citations of individual publications. Therefore, comparisons across research fields have to be made with great caution since the tradition of publishing varies considerably between different fields (publication types, language, etc.).

The model was introduced as a bibliometric indicator for performance-based funding of research institutions in Norway on a national basis, but it has also been used in the bibliometric study of the research assessment of the University of Gothenburg (Holmgren and Bertilsson Uleberg 2011). The results from these studies will be used as a reference for the present study along with analyses from Stockholm University, which has been using the model as a quality development tool for some years.

Since the model is designed to reallocate research funding on a national level, it also has an incentive of driving research performance by stimulating the production of more publications on the prestigious level 2. The Faculty of Social Sciences at Uppsala University introduced the model as such a tool in 2009 when it was adopted as a bibliometric indicator for reallocating research funding within the Faculty. The departments of this faculty have thus had this incentive for a couple of years, and in some cases single research units have adjusted their publication policy according to the model.

The study will examine all publications from the above types from the Disciplinary Domain of Humanities and Social Sciences in Uppsala University in 2007–2010 (the Norwegian model also includes some articles in conference proceedings series, but these will be excluded in this study since there are only a few of them within the disciplines).

The classification of journals and publishers is done by expert panels appointed by the Norwegian National Research Council and is revised annually. In this study we are using the classification from 2010, which is available at http://dbh.nsd.uib.no/kanaler and also as an Excel file at the KoF11 website.

Results

The source of publication data in this study is the Uppsala University’s publication database DiVA. The total number of publications in DiVA from the humanities and social sciences between 2007 and 2010 is 8,488. Of these, 3,012
(35.5%) are regarded as scientific publications according to the Norwegian model classification (see Figure 2). The distribution between the two scientific levels is 2,193 publications in level 1 (72.8%) and 819 in level 2 (27.2%). (See Table 1.)

The percentage of publications in the prestigious category (level 2) well matches the findings in the University of Gothenburg report, where the total sum of publications in level 2 was 23.6% for the whole university. A comparison with the Norwegian universities shows that in 2010, 23.3% of all their scientific publications were assigned at level 2.\(^1\) Since the share of publications classified as level 2 is usually higher in science and medicine, the results from the Uppsala study of the humanities and social sciences is quite satisfactory.

Stockholm University uses the Norwegian model for follow-up-studies of the research activity on department level, and since the university has a large research output in the humanities and social sciences it serves well for benchmarking purposes. The latest report (2010) shows that the number of publications on level 2 is 21.6% for the Faculty of Social Sciences and Faculty of Law while the Faculty of Humanities has a higher proportion of level 2 publications, 28.5%.\(^2\)

A general observation is that the total share of level 2 publications from the humanities and social sciences at Uppsala University is well in line with results from Norwegian and other Swedish universities. If we accept as a benchmark that about 25% of all scientific publications for a research unit should be on level 2, we find that about 15 of 33 departments or units pass this limit (see Figure 3). It is interesting to see that these come from all faculties and nearly all panels are represented, with at least one department with a high proportion of publication on level 2. However, if we examine the results on the department level we find that there are substantial differences within the disciplines.

Before we go into more detailed discussion about performance outcome, we have to have in mind that comparisons between faculties is very hard to do since there are substantial structural differences:

- Publishing tradition varies both between and within faculties. Some disciplines have a strong tradition of publishing in Swedish, which is a disadvantage when using the model since the channels on level 2 in the Norwegian system are mostly in English.

- The departments in the Faculty of Social Sciences have in some cases adjusted their publication strategy since the model has been used for research funding allocation, while the other faculties did not yet have this incentive.

With these reservations in mind we can examine the publication activity within the domain more carefully. In Table 2 we find more detailed information on the

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\(^{1}\) Database for statistikk om høgre utdanning, Norsk samfunnsvitenskapelig datatjeneste AS, 2011
http://dbh.nsd.uib.no/pub/?rapport=antall

\(^{2}\) http://www.sub.su.se/omsub/bibliometri.aspx
Figure 2. Proportion of publications from the Disciplinary Domain of Humanities and Social Sciences in Uppsala University assigned to the Norwegian level 1 or 2 compared with all publications in DiVA 2007–2010
Table 1. Bibliometric indicators from the Norwegian model at the Disciplinary Domain of Humanities and Social Sciences in Uppsala University 2007–2010 based on whole counting (rounded off to integers).

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*Dept of Education (218, within Social Sciences) refers to a former single department, active until the end of 2010, while Dept of Education (261, within Educational Sciences) refers to the new, merged department active from 2011.
Figure 3. Proportion of publications from the Disciplinary Domain of Humanities and Social Sciences in Uppsala University on level 1 and level 2 of all publications assigned to the Norwegian model 2007–2010
Table 2. Bibliometric indicators from the Norwegian model at the Disciplinary Domain of Humanities and Social Sciences in Uppsala University 2007–2010 based on fractional counting (rounded off to integers).

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*Dept of Education (218, within Social Sciences) refers to a former single department, active until the end of 2010, while Dept of Education (261, within Educational Sciences) refers to the new, merged department active from 2011.
department level. First of all, fractional counting (Frac P) is being used, which means that a department’s share of credit for a certain publication is due to how many authors from that department are represented among all authors of the publication. We also estimate the total points from the Norwegian model (N) but that sum is of course strongly affected by the total number of papers from the department (for a more detailed definition of the indicators see Appendix).

The two departments with the highest proportion of publications in prestigious journals or publishers is the Department of Social and Economic Geography and the Department of Peace and Conflict Research, both with nearly 50% of their publications assigned at level 2. Within the Faculty of Social Sciences also the Department of Psychology shows a high proportion of level 2 publications (40%).

The Faculty of Languages shows a high proportion of level 2 publications in nearly all departments with the Department of English and the Department of Linguistics and Philology at the top with 40% each.

In the Faculty of Arts we find a more diverse situation with some departments or units with well over 30% of their publications at level 2. The Department of Philosophy, the Department of ALM (Archives, Libraries, Museums), and the Hugo Valentin Centre all have large proportions of such publications, but the total number of publications from these departments is quite low. The Department of Archaeology and Ancient History is the only unit with a substantial number of publications that also has a large part in level 2 (36%).

Some departments in the faculty show low figures of level 2 publications, but this can at least in some cases be explained by a strong tradition of publishing in Swedish in the respective disciplines.

If we examine the departments with a high share of output in level 2 in terms of their publication profile, we find that nearly all have a large proportion of journal articles (50% or more) but there are exceptions, like the Department of Business Studies, which gets most of its high share of level 2 publications from monographs and chapters in anthologies, etc. (about 60%).

References
Appendix

A short introduction to the Norwegian model and how it is used in this study

The model divides the publication channels into three levels. Level 0 (non-scientific), level 1 (scientific), and level 2 (prestigious). Each publication is assigned to one of these levels depending in which journal or by which publisher the publication is published.

The publication types that are examined in the model are:

- scholarly articles in journals including review articles (ISSN)
- monographs (ISBN)
- scholarly articles in anthologies, etc. (ISBN)

Depending on which level a single publication is assigned, a sum of points is awarded the publication according to the following scheme (level 0 receives no points):

<table>
<thead>
<tr>
<th>Publication type</th>
<th>Level 1</th>
<th>Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scholarly articles in journals (ISSN)</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Monographs (ISBN)</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Scholarly articles in anthologies (ISBN)</td>
<td>0.7</td>
<td>1</td>
</tr>
</tbody>
</table>

If a publication has several authors, the point sum is divided between the authors (fractional counting). For example, if, in a paper with three authors, only one is assigned to a department in Uppsala University, the department only receives one third of the total sum. If there are three different departments represented in the authors list the departments get one third each, etc.

In this report we examine all publications from the departments in the Disciplinary Domain of Humanities and Social Sciences reported in the Uppsala University publication database, DiVA, with a publication year between 2007 and 2010. The publications are being visualised at https://glis.uu.se/DivePort#page=a0017 and every author has had access to this register beforehand to check that the information is correct.

The register of publications was then matched against the Norwegian register of publication channels at http://dbh.nsd.uib.no/kanaler/. The channels are also available as an Excel-file at the KoF11 website. Publications that did not get a match with the Norwegian register were checked manually. Every publication that has a channel represented in the Norwegian register is assigned the respective level and is given a score according to that level and how many authors were represented in the publication.
Definitions of indicators

The following table describes the indicators used in the report.

Table 3. Definition of Norwegian bibliometric indicators and related data used in KoF11.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Number of unique publications in the Uppsala university publication database, DiVA</td>
</tr>
<tr>
<td>Pnorway</td>
<td>Number of unique publications published in channels defined as scientific (level 1 or 2) in the Norwegian system</td>
</tr>
<tr>
<td>Level 1</td>
<td>Number of unique publications found in scientific journals or publishers level 1</td>
</tr>
<tr>
<td>Level 2</td>
<td>Number of unique publications found in scientific journals or publishers level 2</td>
</tr>
<tr>
<td>FracP</td>
<td>Number of fractionalized publications in the Uppsala University publication database, DiVA</td>
</tr>
<tr>
<td>FracPnorway</td>
<td>Number of fractionalized publications published in channels defined as scientific (level 1 or 2) in the Norwegian system</td>
</tr>
<tr>
<td>%Level 1</td>
<td>Percentage of fractionalized publications found in scientific journals or publishers level 1</td>
</tr>
<tr>
<td>%Level 2</td>
<td>Percentage of fractionalized publications found in scientific journals or publishers level 2</td>
</tr>
<tr>
<td>%articles</td>
<td>Percentage of fractionalized publications defined as journal articles according to the Norwegian system</td>
</tr>
<tr>
<td>%monographs</td>
<td>Percentage of fractionalized publications defined as monographs according to the Norwegian system</td>
</tr>
<tr>
<td>%anthologies</td>
<td>Percentage of fractionalized publications defined as chapters in anthologies, etc. according to the Norwegian system</td>
</tr>
</tbody>
</table>
Part V: Appendices

Appendix A. Evaluation package
Appendix B. Terms of reference for expert panels
Appendix C. Panel report template
Appendix D. Panel member requirements
Appendix E. Panel members
Appendix F. Instructions to departments for the planning of panel site visits
Appendix G. Site visits
Appendix H. Results of questionnaire
Appendix I. Photographs
Appendix A. Evaluation package

Note: The following instructions were distributed to departments and faculties on 1st November 2010 and describe the ‘Evaluation package’ to be prepared by each department for the review panels.

“Quality and Renewal 2011”
Research evaluation at Uppsala University

To the chairs of Uppsala University departments

The primary goal of the evaluation, KoF11, is to identify strong areas of research and successful scientific constellations at Uppsala University. It is particularly important to find emerging science and future opportunities for new research. The evaluation will not compare different departments and disciplines within Uppsala University with each other. It aims at probing the standing in national and international perspectives, reflecting the quality and renewal of each department compared to that of other universities involved in the same research field.

KoF11 also aims at assessing the development in the years since the previous evaluation, KoF07, and to provide a foundation for future efforts to strengthen and renew the broad range of research activities at our university. In parallel to the peer-review research assessment a separate bibliometric study is planned to be undertaken in the same way as in KoF07.

As for KoF07, the new evaluation will provide reliable background material for future decision-making and it will offer departments and faculties support in their work to formulate plans for future research.

The present document is meant to form a concise but informative background material for the expert panels to aid their work in carrying out the evaluation. It is divided into three parts. The first part is a written description of research activities, opportunities for renewal and a self-assessment to be completed by the department. The second part is a quantitative summary of certain research related activities, to be completed by the department, and the third part presents data as extracted from databases. Departments may also provide relevant web addresses in order to offer additional means of obtaining information about the research activities.

The complete set of publications contained in DiVA, our Academic Archive On-line, will be made available to the expert panels in March 2011 and DiVA needs to be updated as far as possible by that time. Please note that the Univer-
University Library takes responsibility to collect existing records from Web of Science 2007–2010 (the bibliometric “window”) into DiVA, and if possible also to add department affiliation for the Uppsala researchers. The departments have to double-check that all publications are registered and that the right department or research program is affiliated. Detailed information about this will be published shortly.

For publications included in the two different lists of papers selected by the department, and which are not available electronically (e.g. books), the department is asked to make at least two copies available to the KoF11 project management by March 1, 2011.

The present method for collection of evaluation material is designed with the intention to minimize workload for the departments, still offering relevant information to the expert panels. The project management hopes that the department will find the information collection process reasonable and adequate.

Uppsala 1 November 2010

Prof. Joseph Nordgren
Project Manager, KoF11
Evaluation document, KoF11

To be completed (in English) by the Department and submitted/uploaded by Monday Feb. 28, 2011 at the latest. Use this document (template) and submit one aggregated document per department. The evaluation document will be available, as it is submitted, to the external expert panels immediately after this.

The final document will consist of three sections:

Part A. A written description of research activities, renewal, etc., to be completed by the department – see below.
Part B. A quantitative summary of certain research related activities, to be completed by the department – see below.
Part C. Certain basic data extracted from the common databases, with the possibility to make comments upon – this will be distributed no later than Dec. 10, 2010, and updated in Feb. 2011.

Part A: Strategic aspects on research

Name of the department:..................................

A1.
   i) Give a summary of the current research activities. State primary missions and goals as well defined as possible.
   ii) List actions that would improve the quality of the department’s research, and obstacles that hinder improvement.
   iii) Describe interdisciplinary activities and networks, giving information on joint publications and funding, and provide statements on the suitability of the present organizational placement within Uppsala University.

Clarification: The research profiles of the department should be clear from this summary. Limitation: All departments are allowed to submit at least two (2) A4-pages. The maximum number of pages allowed for the summary depends on the number of full-time equivalent research-active staff at the department. For maximum number for each department, see attached Appendix - “Max no of pages (Q A1)”.

Response...

A2.
   i) Describe current, particularly successful research activities.
   ii) List institutions or groups nationally and internationally, which are considered suitable for benchmarking (in relation to activities selected under A2.i), and state the department’s view on its own standing in comparison to these.
Limitation: All departments are allowed to submit at least one (1) A4-page. The maximum number of pages allowed for Q A2 depends on the number of full-time equivalent research-active staff at the department. For maximum number for each department, see attached Appendix - “Max no of pages (Q A2)”.

Response…

A3.
Describe the most promising research directions for the department in a perspective of 5–10 years. Give an account for how the accomplishment of successful pursuit of these research directions would be attained, and what indicators would be relevant, e.g. in terms of proportion between different categories of researchers and other personnel.

Limitation: All departments are allowed to submit at least one (1) A4-page. The maximum number of pages allowed for Q A3 depends on the number of full-time equivalent research-active staff at the department. For maximum number for each department, see attached Appendix - “Max no of pages (Q A3)”.

Response…

A4.
Select and present a list of publications – or other research outputs – representing the research activity at the department.

Clarification: Selected publications can be from any year and could be written in English, or other language which is commonly used in the research field in question. If the publication is electronically available, include a link. For publications that are not available electronically (e.g. books), the department is asked to provide at least 2 copies for the panel members. All selected publications should also be available in print during the expert panel visit.

Research outputs other than publications can be patents, products, methods, computer programs, etc.

Limitation: All departments are allowed to list at least two (2) publications. The maximum number of publications (research outputs) to be listed depends on the number of full-time equivalent research-active staff at the department. For maximum number for each department, see attached Appendix - “Max no of publ (Q A4)”.

List…

A5.
Select and present a list of publications – or other research outputs – representing renewal of research activity at the department.

Clarification: Selected publications can be from any year and could be written in English, or other language which is commonly used in the research field in question. Publications in press could also be included. If the publication is electronically available, include a link. For publications that are not available electronically (e.g. books), the department is asked to provide at least 2 copies for the panel members. All selected publications should also be available in print during the expert panel visit.

Research outputs other than publications can be patents, products, methods, computer programs, etc.
Limitation: All departments are allowed to list at least one (1) publication. The maximum number of publications (research outputs) to be listed depends on the number of full-time equivalent research-active staff at the department. For maximum number for each department, see attached Appendix - “Max no of publ (Q A5)”.

List...

A6.
Present a list of publications not included in the DiVA database (UU Academic Archive On-line) – optional.

Clarification: All publications should be registered in DiVA by March 1, 2011, to be available to the external experts and for the separate bibliometric analysis. In the case that a researcher has moved to Uppsala University within the last years, there could be vital publications contributing to the research but not registered in DiVA.

A list of these publications from 2007–2010 could be added here (optional). This additional list will also be available to the external experts, and to the bibliometric analysis.

List...

A7.
Comment on the department’s situation and actions in response to the previous research assessment, KoF07, both with respect to decisions taken on university or faculty level, and to the department’s own decisions. Also, comment on other effects or implications of KoF07 for the department.

Limitation: All departments are allowed to submit maximum two (2) A4-pages.

Response...

A8.
Present a list of significant prizes and awards.

Clarification: List the person, age (when receiving award), sex, year and award. Include prizes/awards presented to individual researchers or to groups/department since 2007. Only international or significant national prizes should be listed.

List...

A9.
Additional sources of information.

Clarification: In order for the external experts to get a complete and correct picture of the department, please list additional sources of information, such as website addresses for the department and research/research groups (if applicable). If information is only available in Swedish, clearly state this after the address in question.

List...
Part B: Quantitative summary of research activities

Clarification: In the tables total numbers for the department should be presented (not detailed lists). During the visits the experts might ask for more detailed explanations regarding the numbers presented.


<table>
<thead>
<tr>
<th>Total number</th>
<th>Number of individuals contributing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plenary or keynote talks at international conferences</td>
<td></td>
</tr>
<tr>
<td>Invited talks at international conferences</td>
<td></td>
</tr>
<tr>
<td>Assignment in research councils and foundations</td>
<td></td>
</tr>
<tr>
<td>Assignment as expert at evaluations for professor and lecturer positions</td>
<td></td>
</tr>
<tr>
<td>Assignment as editor or member of editorial boards</td>
<td></td>
</tr>
<tr>
<td>Member of international scientific councils</td>
<td></td>
</tr>
<tr>
<td>Member of academies and learned societies</td>
<td></td>
</tr>
<tr>
<td>Other, specify (e.g. hosting of major conferences, etc.):</td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Total number</th>
</tr>
</thead>
<tbody>
<tr>
<td>External recruitments (with doctoral exam from another university)</td>
</tr>
<tr>
<td>Internal recruitments (with doctoral exam from Uppsala University)</td>
</tr>
<tr>
<td>Number of granted external funds for new projects</td>
</tr>
<tr>
<td>Other, specify:</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Total number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research visits abroad (of at least 3 months duration)</td>
</tr>
<tr>
<td>Visiting researchers (of at least 3 months duration)</td>
</tr>
<tr>
<td>Number of collaborating institutions with joint publications</td>
</tr>
<tr>
<td>Other activity according to traditions of the research field (specify; scientific expeditions, field work etc.):</td>
</tr>
</tbody>
</table>

 Appendix A
### B4. Engagement and interaction with society (since Jan. 2007)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Total number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjunct professorships</td>
<td></td>
</tr>
<tr>
<td>Popular science papers/books</td>
<td></td>
</tr>
<tr>
<td>Textbooks</td>
<td></td>
</tr>
<tr>
<td>Spin-off commercial companies</td>
<td></td>
</tr>
<tr>
<td>Governmental/societal assignments</td>
<td></td>
</tr>
<tr>
<td>Other activities according to traditions of the research field (specify; patents, popular science presentations, etc.):</td>
<td></td>
</tr>
</tbody>
</table>
Part C: Data extracted from common databases

1. Personnel

*(Jan. 2011)*

- Number of employees:
- Full-time equivalents (FTE):
- Average age (all staff):
- % Females (all staff):
- FTE, Full professor (chair):
- Research-active staff:
- Full professor (promoted):
- Senior lecturer:
- Researcher:
- Postdoc + Assistant Professor:
- Doctoral student:

*Tot. FTE, Research active:*

*FTE, Other staff:*

*% Research-active staff:*

- Full prof. (chair) Average age:
- % Females:

... (Same data for promoted prof., senior lecturer, researcher, postdoc+assist. prof. and doctoral students)

2. Research exams

*Doctoral exams (2005–09)*

- Total number of exams (2005–09):
- Number of exams/year, average:
- Net study time (years), average:
- Gross study time (years), average:
- % Female graduates:
- Age at examination (years), average:

*Doctoral exams (2010)*

- Number of exams:
- Net study time (years):
- Gross study time (years):
- % Female graduates:
- Age at examination (years):

... (Same data for licentiate exams)

3. Publications

*Publ. all languages (2005–09), average per year*

- Article in journal:
- Article, book review:
- Article, review/survey:
- Book:
- Chapter in book:
- Conference paper:
- Report:
- Thesis, doctoral:
- Thesis, licentiate:
  - Student paper (incl. exam):
- Other publication:

*Total no. of publ/year (average):*
4. Economy
2010 (after closing of the books)

Total revenue (Million SEK):
Total costs (Million SEK):

Revenue sources (MSEK)
(110) Education, basic/adv. level:
(120) Commissioned education:
(122) Other education:
(210) Research/res. education:
(220) Externally funded research:
(230) Commissioned research:

Major costs (MSEK)
Personnel:
Premises:
Other operating costs:
Depreciation:
Common costs:
Appendix B. Terms of reference for expert panels

Note: The following instructions were distributed to panellists some months before the panel site visit. The recommended expressions for quality rating was adapted somewhat differently by some panels (scale 1–5, etc.).

The present document describes the Terms of Reference to be used by the panels engaged in the research evaluation KoF11. The document should be read together with the document Instructions to Departments for the planning of panel site visits and the documents submitted by the departments.

Background

Uppsala University, founded in 1477, has nine faculties located at five different campus areas. A few facts (as of 2011) are the following:

- Education and research across nine faculties and some 60 departments; theology, law, arts, languages, social sciences, educational sciences, medicine, pharmacy, and science and technology
- 55 study programs for beginners, 59 master programs, and some 1,900 single-subject courses. Of these 34 master programs and 370 single-subject courses are taught in English
- More than 42,000 undergraduate and graduate students enroll for classes, corresponding to about 23,000 full-time students
- Student exchange agreements with nearly 500 universities in 50 countries
- Postgraduate education includes 2,000 doctoral students, and some 300 doctoral degrees are conferred each year
- Some 3,000 international collaborative research agreements
- 5,000 academic publications per year
- 5,500 employees - including 3,600 teachers/researchers
- 550 professors
- Turnover 2010 of 5,100 MSEK (580 M€ or 780 MUSD); 65 % of which for research and graduate education

The present evaluation is initiated by the Vice-chancellor and it includes departments and centers with research activities.

Objectives of the evaluation

KoF11 is the second comprehensive research evaluation of Uppsala University as a whole, following KoF07 conducted in 2006–07. The primary goal of the evaluation is to identify strong areas of research and successful research constellations in the broad spectrum of research at Uppsala University. It also aims at finding emerging science and potential for renewal. The evaluation should probe the standing of Uppsala University research activities in an international perspective (whenever applicable) and does not primarily aim at comparing...
different disciplines within the university. The evaluation will provide means to strengthen the quality of the scientific activities at the university by offering reliable background material for the decision-making process for future strategic decisions. It will also offer departments and faculties support in their own work on formulating plans for future research.

The evaluation is not aimed at highlighting individual scientists but rather assess performance and prospects of research groups, and the departments as a whole. The reports from the departments (written and oral) on their own work constitute the basic material for the evaluation.

As a response to the results of the KoF07 evaluation a number of measures were taken, both in terms of structural changes and resource allocations. In a university-wide exercise, the various faculties were given the task to submit proposals that would resonate with the KoF07 evaluation recommendations.

One result was some 90 research positions at various levels, created and filled. It is an additional charge to the KoF11 panels to evaluate the results of KoF07, in terms of resources allocated and the implementation of recommendations.

In a first stage to implement the recommendations from the KoF11 evaluation panels, the Vice-chancellor will allocate several 10’s of millions SEK annually from 2011 onwards. Other measures (e.g. reorganisations) could of course also be taken in order to respond to the recommendations of the evaluation panels.

**Method of evaluation**

The evaluation is carried out by using 25 panels with highly ranked international experts that evaluate and elucidate the research activities based on a five-day site visit, together with information provided by the departments.

Each panel has an international Chair and a group of experts who together cover the different research areas. It also has one representative from another Swedish university, often representing an adjacent research field, who can assist in matters that require knowledge and insight in e.g. Swedish university and research funding practices. A local “panel guide” also supports the panel.

The panel members receive background material in advance by means of an Internet portal, in some cases supplemented with paper documents. The material consists of facts and figures regarding each department’s personnel, economy, research examination, publication [part C], and a number of quality indicators [part B].

It also includes a self-assessment where the department describes its research activities, networks and collaborations, and its view on future research directions and renewal of research [part A]. A list of a limited number of publications, selected by the department, is appended to the document. Complete lists of all publications during the last 10 years, or more, can be found and filtered through the publication database DiVA (http://uu.diva-portal.org/smash/searchad.jsf).

A bibliometric analysis of the publications for the 4-year period 2007-2010 will be conducted as a separate exercise in order to obtain a field-normalized picture of the international impact of the research.

In order to allow for an alternative way of assessing indicator-based perfor-
mance analysis a second bibliometric analysis will also be made, conducted by estimating the number of publications through a well-defined set of publication channels. This is of particular interest for Humanities and Social Sciences, for which the Web of Science databases have limited applicability for bibliometric analysis. The bibliometric analyses will not be part of the evaluation material provided to the panels at the time of the visit.

Evaluation criteria

The basic unit for collection of background material is a department (in a few cases a centre). For departments with a relatively homogeneous research structure this is also the basic unit for evaluation. In several cases, though, different parts of a department represent research of diverse character, and then they have been distributed on different expert panels. In other cases where research at different departments are sufficiently related, departments are grouped together to represent a research area that can be evaluated by one expert panel.

The panel should work as a group to attain collective assessments, at the same time making use of the complementary expertise among the members. The quality rating apply to the research presented to the panels, which may not include all activities, although the panels are free to comment also on other research that they are aware of.

The quality rating for ongoing research activities is primarily expressed in terms of international standing. However, it is recognized that there are certain fields that are very special and not directly assessable on an international scale, although they may be of highest quality. It may sometimes still be possible to make internationally comparative assessments regarding tools and methods used. The panels are asked to comment specifically in such cases.

The panels are instructed to make their quality assessments in a way that makes reference to international standards in all applicable cases. This is done primarily at department (or comparable unit) level but may also be done at lower organisational level, down to research group level. However, the researchers are generally not to be evaluated as individuals.

Evaluation according to the criteria given must be made with due consideration of the mission of the department or unit in question. The following expressions for the rating of quality of research should be used:

- **Top-quality** (outstanding work at world leading level with great international impact)
- **Internationally high standard** (excellent work, next to world-leading level)
- **Internationally recognized standard** (very good work, attracting international interest)
- **Acceptable standard** (good work, attracting national interest or has great relevance)
- **Insufficient** (not acceptable quality, activities should be revised or discontinued)

Since there may be a spectrum of quality levels associated with a particular research field pursued, the panels are asked to qualify their assessments by stating...
to what extent a research activity meets a particular quality standard.

Whenever possible, the panels are encouraged to qualify their ratings in terms of comparisons with international groups and activities.

Comments should be given regarding emerging science and renewal in terms of scientific quality and feasibility for realization. The panels are asked to comment on new research directions, pursued or planned, in terms of potential for success. Issues regarding various requirements, collaborations, etc., relevant to the prospects for success should be addressed.

The panels are asked to comment on the measures taken as a response to the results' of the previous evaluation in 2007 (KoF07). The input material for this assessment is a provided list of resource allocations made, and information given in the department documents and at the site visits.

Finally, the panel is asked to consider issues regarding the interaction with society, in particular in terms of relevance of research.

**Working arrangements of expert panels**

During the first day of the visit an introduction will be given and time allocated to plan the work during the visit. The panel chair coordinates the work of the panel and is also responsible for coordinating the writing of the report.

A template for the report is provided and time will be given to work on the report during the visit. The report should primarily focus on identifying existing strong research activities as well as emerging research with great potential.

At the end of the visit week the chair should give a brief account, an exit interview, of the main conclusions of the panel.

The site visits take place in one of two consecutive weeks, depending on panel. The first visit is on May 9–13, 2011; the second on May 16–20, 2011. On each Friday afternoon there will be a meeting of all panel Chairs in order to review matters of cross-disciplinary character and to discuss certain points of interest arising in the evaluation process.

**Final evaluation report**

A final evaluation report will be edited by the project management. It will describe the procedure for the evaluation, and append the individual panel reports. It will also give an account for the conclusions made at the panel chair meetings regarding cross-disciplinary matters. Furthermore, it will present the results of the bibliometric study undertaken by external expertise. Finally, it will give recommendations concerning the use of the report in the continued work on quality development at the university.

**Confidentiality and trust**

The panel members accept not to misuse non-public information that is disclosed to him/her through the evaluation. In accordance with Swedish legislation, the panel reports will be public once they are submitted in their final form.

The panel members are required to declare any conflict of interest with respect to the subjects of the evaluation.
Appendix C. Panel report template

The expert panels are asked to assess the quality of research at the department/unit in an international perspective based on the instructions given in the Terms of reference. In particular, the panels are asked to identify strong research activities and potentially interesting opportunities for renewal. In the following are given headlines under which the panels are asked to provide comments and recommendations.

General assessment of the department/unit
Give a brief account of the impressions of the research at the department. Comment on the research profile with respect to various issues like diversity, synergies, multi- and interdisciplinary activities, outreach, demographic and gender profile, etc.

Quality of research
Comment on research activities, with emphasis on identifying strong research and successful constellations. Give quality ratings based on the instructions in Terms of reference, if necessary by stating to what extent a particular rating is met.

Research environment and infrastructure
Comment on research environment, e.g. in terms of personnel composition (senior, junior, student, technical or other personnel, etc.), local collaboration, interaction with visiting scientists, seminar activities, etc. Comment on the infrastructure, e.g. in terms of it being adequate, sufficiently available, or else.

Networks and collaborations
Comment on the degree and quality of networks and international collaborations.

Opportunities for renewal and emerging science
Comment on activities for renewal and emerging science and make assessments in terms of scientific quality of ideas and plans as well as their feasibility of realization and prospect for success. Comment on impressions of junior faculty activities.

Actions for successful development
Comment on actions for the further improvement of the quality of the research.

Effects of the KoF07-evaluation
Comment on the measures taken as a result of KoF07, in terms of resources allocated and implementation of recommendations.

Other issues
Comment on other issues of choice, e.g., impressions of doctoral/postdoctoral training. Comment also on issues regarding interaction with society, in particular in terms of relevance of research.
Appendix D. Panel member requirements

Panel composition
Chairperson.
4–9 international panel experts.
1 Swedish panelist.

Required qualifications

Chairperson
• Generalist from the research field in question.
• Distinguished scientist with high integrity.
• Experience from international evaluations.
• Suitable for assuming chair responsibilities.
• Not active in Sweden.

Panel expert
• Preferably active outside Sweden. Primarily in Europe, incl. Scandinavia, and secondly outside Europe.
• Distinguished scientist in one or several fields relevant to the panel.

Swedish panelist
• From other Swedish university than Uppsala, preferably active in adjacent field.
• Knowledgeable in Swedish university research circumstances.
• Preferably experience from research council work, or as dean or similar.

General
For all panellists, issues relating to conflicts of interest are to be observed with regard to financial or research-related dependencies between panel members and the evaluated unit.
All fields of the evaluated department should be represented in the panel. Gender balance should be aimed at.
Tasks

Chairperson

• Be involved in selected preparation activities, including selection of the panel experts.
• Lead the work of the panel.
• Assess and document the quality of the activities of the evaluated department or unit.
• Be responsible for the panel report.
• Offer advice on actions for successful development and renewal.
• Take part in discussions at chair meeting and participate in the overall analysis after the site visits.

Panel expert

• Assess and document the quality of the activities of the evaluated department or unit.
• Offer advice on actions for successful development and renewal.

Swedish panelist

• Assist the panel with an insight into the conditions prevailing in the Swedish university environment.
• Aid the panel in keeping the focus on the objectives, methods and criteria of the evaluation.
• Take part in the quality assessment work of the panel.
Appendix E. Panel members

Economics, Statistics (Panel 1)

Niels Westergård-Nielsen, Aarhus University, Denmark (Chair)
Massimo Bordignon, Catholic University of Milan, Italy
[Kjell Salvanes, Norwegian School of Economics and Business Administration, Norway, late withdrawal]
Albert Satorra, Pompeu Fabra University, Spain
Steinar Strøm, University of Oslo, Norway
Timo Teräsvirta, Aarhus University, Denmark
Kurt Brännäs, Umeå University, Sweden

Panel guides: Ewa Hjertsén and Markus Hed, Uppsala University

Chair presentation

Niels Westergård-Nielsen

Professor at the Aarhus School of Business, Aarhus University Department of Economics, since 1989. Director of the Center for Corporate Performance. PhD (lic.polit) from University of Copenhagen.

Research interests include wage formation at individual and firm level, unemployment and employment, matched worker and firm data, personnel economics, and health economics.

Member of the Wage Commission commissioned by the Danish Minister of Finance, 2008–2010. Research Fellow, IZA Bonn, and Member of Personnel Economics Group, National Bureau of Economic Research, Cambridge, Mass., USA.
Business Studies, Social and Economic Geography, Informatics and Media (Panel 2)

D. Eleanor Westney, York University, Canada (Chair)
Vitor Corado Simões, Technical University of Lisbon, Portugal
Jussi S. Jauhiainen, University of Turku, Finland
Peter LaPlaca, University of Hartford, USA
[Kari Lukka, Turku School of Economics, Finland, late withdrawal]
Carsten Sørensen, The London School of Economics and Political Science, United Kingdom
Frank Webster, City University London, United Kingdom
Claes G. Alvstam, University of Gothenburg, Sweden

Panel guide: Sven Jungerhem, Uppsala University

Chair presentation

D. Eleanor Westney

Scotiabank Professor of International Business at The Schulich School of Business, York University, Canada, since 2007. PhD in Sociology from Princeton University.

Research interests include organizational behaviour and industrial relations.

Joined the Schulich School of Business after 25 years at the M.I.T. Sloan School of Management, where she held the Sloan Fellows Chair in the Strategy and International Management group.

She has written extensively on Japanese organizations, on the internationalization of R&D, and on institutional theory and multinational enterprise. She is a Fellow of the Academy of International Business and is currently the Dean of the AIB Fellows.
Education, Sociology, Food, Nutrition and Dietetics (Panel 3)

Gestur Guðmundsson, University of Iceland, Iceland (Chair)
Willy Martinussen, Norwegian University of Science and Technology (NTNU), Norway
Jo Moran-Ellis, University of Surrey, United Kingdom
Thomas S. Popkewitz, University of Wisconsin-Madison, USA
Ritva Prättälä, National Institute for Health and Welfare, Finland
Alan Warde, University of Manchester, United Kingdom
Gaby Weiner, University of Edinburgh, United Kingdom
Geoff Whitty, University of London, United Kingdom
Sune Sunesson, Lund University, Sweden

Panel guide: Thord Österberg, Uppsala University

Chair presentation

Gestur Guðmundsson

Professor at the Faculty of Education Studies, University of Iceland. PhD in Sociology from University of Copenhagen.

Research interest include education, and culture and community participation of young people (16–25 years).

He has a long experience as youth researcher on Iceland, in Denmark and internationally, and has attended various community studies. In 2003–06 he worked in Denmark on the European project Ethnogeneration which deals with youth whose immigrant parents are self-employed.

Besides books on the Nordic model, he has published several books on Rock Music.
Government, Peace and Conflict Studies, Russian and Eurasian Studies, Housing and Urban Research (Panel 4)

Georg Sørensen, Aarhus University, Denmark (Chair)
Dirk Berg-Schlosser, Philipps-Universität Marburg, Germany
Suzanne Fitzpatrick, Heriot-Watt University, United Kingdom
Knut Heidar, University of Oslo, Norway
Viggo Nordvik, NOVA - Norwegian Social Research, Norway
[James Sherr, Chatham House, United Kingdom, late withdrawal]
[Janice Stein, University of Toronto, Canada, late withdrawal]
Sven Steinmo, European University Institute, Italy
Astri Suhrke, Chr. Michelsen Institute, Norway
Sven Hort, Linnaeus University, Sweden

Panel guide: Agneta Emanuelsson, Uppsala University

Chair presentation

Georg Sørensen
Professor of International Politics and Economics at the Department of Political Science, Aarhus University, since 1995. PhD in social science from Aalborg University.

Research interests include democracy and development, and the transformation of the state.

Chairman of the Board, Danish Institute of International Studies, 2003–2010. Member of the editorial board of International Relations of the Asia-Pacific, the international advisory board of International Relations, and the editorial advisory board of Cooperation and Conflict.

Various consultancies for Danish and International organizations working with development and international relations, including United Nations University.
Psychology (Panel 5)

Alan Baddeley, University of York, United Kingdom (Chair)
Carol L. Krumhansl, Cornell University, USA
Wolfgang Miltner, Friedrich Schiller University Jena, Germany
Wolfgang Prinz, Max Planck Institute for Human Cognitive and Brain Sciences, Germany
Lea Pulkkinen, University of Jyväskylä, Finland
Ingvar Lundberg, University of Gothenburg, Sweden
Panel guide: Thomas Ekstrand, Uppsala University

Chair presentation

Alan Baddeley

Professor of Psychology at the University of York since 2003. PhD from Cambridge University. Research interests are in human memory, neuropsychology and in the practical application of cognitive psychology.


Commander of the British Empire (CBE) for contributions to the study of memory. Awarded the Aristotle Prize for contribution to European psychology. American Psychological Association Award for Distinguished Contribution to Science.
Modern Languages – Linguistics and Literary Science (Panel 6)

Gunnel Tottie, University of Zürich, Switzerland (Chair)
Susan Bassnett, University of Warwick, United Kingdom
Walter Daelemans, University of Antwerp, Belgium
Christina Gansel, Ernst-Moritz-Arndt University Greifswald, Germany
Riho Grünthal, University of Helsinki, Finland
Ernst Håkon Jahr, University of Agder, Norway
Roland Marti, Saarland University, Germany
Henning Nølke, Aarhus University, Denmark
Gernot Windfuhr, University of Michigan - Ann Arbor, USA
Eva Haettner Aurelius, Lund University, Sweden

Panel guide: Lars Hagborg, Uppsala University

Chair presentation

Gunnel Tottie

Professor Emerita of English Linguistics at the English Department, University of Zürich. PhD from Stockholm University, Sweden.

Research interests include syntax and pragmatics, negation-quantifier interaction and the use of canonical tag questions in the history of English. Gunnel Tottie’s theoretical framework is variationist, and she is a committed empirical linguist, working mostly with computerized corpora.

She is a member of the editorial board of Language Variation and Change.
Early Languages and Cultures (Panel 7)

Lutz Eberhard Edzard, University of Oslo, Norway (Chair)
Kurt Braunmüller, University of Hamburg, Germany
Rahul Peter Das, Martin Luther University Halle-Wittenberg, Germany
Mark Geller, University College London, United Kingdom
Judith Jesch, University of Nottingham, United Kingdom
Heikki Solin, University of Helsinki, Finland
Cynthia Vakareliyska, University of Oregon, USA
Camilla Wide, University of Turku, Finland
Jerker Blomqvist, Lund University, Sweden

Panel guide: Birgitta Laghé, Uppsala University

Chair presentation

Lutz Eberhard Edzard
Professor of Semitic linguistics, University of Oslo, since 2002. PhD from UC Berkeley.
Research interests include comparative Semitic and Afroasiatic linguistics, Hebrew and Arabic (incl. Judeo-Arabic) texts from different periods, colometric text analysis, history of science, phonology, and language in diplomacy.
Aesthetic-Philosophical disciplines (Panel 8)

Johnny Kondrup, University of Copenhagen, Denmark (Chair)
Anne-Jorunn Berg, University of Nordland, Norway
Maria Hayward, University of Southampton, United Kingdom
Sten Lindström, Umeå University, Sweden
James Massengale, University of California - Los Angeles, USA
Søren Møller Sørensen, University of Copenhagen, Denmark
May Thorseth, Norwegian University of Science and Technology (NTNU), Norway
Annika Waenerberg, University of Jyväskylä, Finland
Mats Malm, University of Gothenburg, Sweden

Panel guide: Monica Blom, Uppsala University

Chair presentation

Johnny Kondrup

Associate Professor of Danish Literature at the Department of Scandinavian Studies and Linguistics, Copenhagen University, since 1998. PhD from University of Copenhagen, Dr.phil. from University of Odense.

Research interests include Danish literature from 1800 to approx. 1930, textual scholarship, biography as a genre, biographical method, and autobiography.

Current research focuses on textual scholarship and the history of editions. Author of several books on biography and autobiography and of a series of articles on textual criticism. Leader of the digital edition of N.F.S. Grundtvig's Works (University of Aarhus) since 2010, and of The History of Editions in Denmark (Dansk Editionshistorie) since 2011. Member of the Norwegian Academy of Science and letters.
Historical-Anthropological disciplines (Panel 9)

Pirjo Markkola, University of Jyväskylä, Finland (Chair)
Wolfgang Behschnitt, Ghent University, Belgium
Kristine Bruland, University of Oslo, Norway
[Robert Marc Friedman, University of Oslo, Norway, late withdrawal]
Vincent Gabrielsen, University of Copenhagen, Denmark
Lotte Hedeager, University of Oslo, Norway
Margaret R. Hunt, Amherst College, USA
Grethe Jacobsen, The Royal Library, Denmark
Torunn Selberg, University of Bergen, Norway
Piers Vitebsky, University of Cambridge, United Kingdom
Gunilla Widén, Åbo Akademi University, Finland
Christer Nordlund, Umeå University, Sweden

Panel guide: Oskar Pettersson, Uppsala University

Chair presentation

Pirjo Markkola

Professor of Finnish History at the Department of History and Ethnology, University of Jyväskylä, Finland, since 2009. PhD from the University of Tampere.


Former President for The Finnish Society for Labour History. Former Vice President for International Federation for Research in Women’s History, and Association for Women’s Studies in Finland. Member of the Research Council for Culture and Society in 2010–2012.
Law (Panel 10)

Hans Petter Graver, University of Oslo, Norway (Chair)
Inge Lorange Backer, University of Oslo, Norway
Juha Karhu, University of Lapland, Finland
Kirsten Ketscher, University of Copenhagen, Denmark
Pia Letto-Vanamo, University of Helsinki, Finland
Palle Bo Madsen, Aarhus University, Denmark
Lotta Vahlne Westerhäll, University of Gothenburg, Sweden
Panel guide: Magnus Ödman, Uppsala University

Chair presentation

Hans Petter Graver
Professor of Private Law, and Dean at The Faculty of Law, University of Oslo, since 1993.
Special fields include Competition law, Administrative law, and EEA/EU law.
In addition to his academic career, he has worked as a State attorney and project director with the Ministry of Consumer Affairs.
Theology (Panel 11)

Trygve E. Wyller, University of Oslo, Norway (Chair)
Heinrich Holze, University of Rostock, Germany
Simo Knuuttila, University of Helsinki, Finland
David Westerlund, Södertörn University, Sweden
Else Marie Wiberg Pedersen, Aarhus University, Denmark
Fredrik Lindström, Lund University, Sweden

Panel guide: Katarina Westerlund, Uppsala University

Chair presentation

Trygve E. Wyller

Professor at the Faculty of Theology, University of Oslo, since 2002. Dean of the Faculty of Theology since 2007.

Research interests include Protestantism, Hermeneutics, secularity, religion and citizenship, systematic theology, ethics, and phenomenology.

In recent years he has focused upon the role that religious-social work can be said to have for the development of citizenship for disadvantaged people, combining an interest in phenomenology and ethics with the new discussion about citizenship.

Editor of the journal Diaconia, Journal for the Study of Christian Social Practice.
Mathematics and parts of IT (Panel 12)

Olavi Nevanlinna, Aalto University, Finland (Chair)
Geir Ellingsrud, University of Oslo, Norway
Michel Gevers, Université Catholique de Louvain, Belgium
Rolf Jeltsch, ETH Zürich, Switzerland
Thomas G. Kurtz, University of Wisconsin - Madison, USA
Jean Serra, University of Paris-Est, France
Susanna Terracini, University of Milano-Bicocca, Italy
Georg Lindgren, Lund University, Sweden

Panel guides: Björn Gembert and Mikael Gerhardsson, Uppsala University

Chair presentation

Olavi Nevanlinna

Professor of mathematics at the Aalto University School of Science and Technology, Helsinki.

Olavi Nevanlinna is a classical applied mathematician, and a member of the family that produced the (Nevanlinna) theory of meromorphic functions in the 1920s.

Former Professor at the Academy of Finland, and Deputy Rector of the Helsinki University of Technology. Former President of the International Council for Industrial and Applied Mathematics, ICIAM. Business experience from being a member of the Board of Pohjola Oyj (financial services), and Chairman of Suomi-yhtiö’s (mutual life assurance) supervisory board.
Physics (Panel 13)

Charles Fadley, University of California - Davis, USA (Chair)
Ignatios Antoniadis, CERN, Switzerland
Nora Berrah, Western Michigan University, USA
Lee Hartmann, University of Michigan - Ann Arbor, USA
Paul Kienle, Technical University of Munich, Germany
Reino Laiho, University of Turku, Finland [changed from panel 17]
Gerd Materlik, Diamond Light Source Ltd., United Kingdom
Risto Nieminen, Aalto University School of Science and Technology, Finland
Daniel Treille, CERN/ETHZ, Switzerland
Anders Liljas, Lund University, Sweden

Panel guide: Linda Gerén, Uppsala University

Chair presentation

Charles ‘Chuck’ Fadley

Advanced Light Source Professor of Physics, University of California - Davis, and Senior Faculty Scientist, Materials Sciences Division, Lawrence Berkeley Laboratory.

His research interests include condensed matter physics, surface and interface physics; homogeneous and nanophase materials science; magnetic materials and nanostructures, synchrotron radiation; photoelectron spectroscopy, diffraction and holography; X-ray absorption and emission, X-ray fluorescence holography.

Elected Fellow in the American Association for the Advancement of Science, American Physical Society, and the Institute of Physics (London).
Chemistry (Panel 14)

Peter J. Stang, University of Utah, USA (Chair)
Tim Clark, University of Erlangen-Nürnberg, Germany
Jenny Emnéus, Technical University of Denmark, Denmark
Sarah Lummis, University of Cambridge, United Kingdom
James McCusker, Michigan State University, USA
Lorenz Walder, University of Osnabrück, Germany
Anthony R. West, University of Sheffield, United Kingdom
Stefan Nordlund, Stockholm University, Sweden

Panel guide: Ulrika Huss Melin, Uppsala University

Chair presentation

Peter J. Stang

Distinguished Professor of Chemistry at the Chemistry Department, University of Utah, since 1992. PhD from University of California, Berkeley.

Research interests include Molecular Architecture via Coordination: Formation of discrete supramolecular species with well defined geometries and shapes via self-assembly; Polyvalent Iodine Species; Alkynyl Esters; and Reactive Intermediates (vinyl cations, unsaturated carbenes).

Member of American Chemical Society, Chemical Society (London), and National Academy of Sciences. American Association for Advancement of Science (AAAS) Fellow. Awarded F.A. Cotton Medal for Excellence in Chemical, the Linus Pauling Medal, and Alexander von Humboldt “Senior U.S. Scientist Award” (three times). Editor, Journal of the American Chemical Society since 2002.
Biology (Panel 15)

Barbara Schaal, Washington University in St. Louis, USA (Chair)
Martha Fedor, The Scripps Research Institute, USA
Merete Fredholm, University of Copenhagen, Denmark
Werner Kloas, Leibniz-Institute for Freshwater Ecology, Germany
Timo Korhonen, University of Helsinki, Finland
Allen J. Moore, University of Exeter, United Kingdom
Göran Nilsson, University of Oslo, Norway
Ada Yonath, Weizmann Institute of Science, Israel
Jan Stenlid, Swedish University of Agricultural Sciences, Sweden

Panel guide: Ulf Westerlund, Uppsala University

Chair presentation

Barbara Schaal

Mary-Dell Chilton Distinguished Professor, Department of Biology, Washington University in St. Louis. PhD from Yale University.

Focuses on the evolutionary genetics of plants, including use of molecular genetic data to understand evolutionary processes such as gene flow, geographical differentiation, and the domestication of crop species. She studies plant species native to the U.S., tropical crops and their wild relatives, and Arabidopsis.

Vice president of the National Academy of Sciences. She is one of 20 members in PCAST, an advisory group of leading scientists and engineers in USA who directly advise President Obama on scientific and technical issues. She has been president of the Botanical Society of America and president of the Society for the Study of Evolution.
Earth Sciences (Panel 16)

Michael Benton, University of Bristol, United Kingdom (Chair)
Hans-Peter Harjes, Ruhr University Bochum, Germany
Bert Holtslag, Wageningen University, The Netherlands
James Jackson, University of Cambridge, United Kingdom
Jens Christian Refsgaard, Geological Survey of Denmark and Greenland (GEUS),
Denmark
Elisabeth Haggård, Stockholm University, Sweden

Panel guide: Björn Sundquist, Uppsala University

Chair presentation

Michael ‘Mike’ Benton

Professor of Vertebrate Palaeontology at the Department of Earth Sciences, University of Bristol, since 1997. Head of Joint School of Geology and Biology. PhD from the University of Newcastle-upon-Tyne.

- Research interests include the diversification of life through time, quality of the fossil record, shapes of phylogenies, age-clade congruence, mass extinctions, Triassic ecosystem evolution, basal diapsid phylogeny, basal archosaurs and the origin of the dinosaurs.
Engineering Sciences (Panel 17)

Jens Gobrecht, Paul Scherrer Institute, Switzerland (Chair)
AbuBakr S. Bahaj, University of Southampton, United Kingdom
Thomas Bjørnholm, University of Copenhagen, Denmark
Cor Claeys, Katholieke Universiteit Leuven, Belgium
Harri Kopola, VTT Technical Research Centre of Finland, Finland
Geir E. Øien, Norwegian University of Science and Technology (NTNU), Norway
Sune Svanberg, Lund University, Sweden

Panel guide: Ylva Bäcklund, Uppsala University

Chair presentation

Jens Gobrecht

Head of the “Laboratory for Micro- and Nanotechnology” (LMN) at the Paul Scherrer Institute, Villigen, Switzerland, since 1993. Professor at the University of Applied Sciences Nordwestschweiz, and Head of the Institute of polymer nanotechnology since 2004. Doctor of Engineering from TU Berlin. Research areas include molecular nanotechnology, nanomagnetic structures, X-ray optics, micro- and nanofabrication processes, and vacuum-nanoelectronics. LMN holds world records in resolution in X-ray microscopy and extreme-UV-interference lithography.

Formerly at ABB Corporate Research, Switzerland, where he led the development of the first high-voltage insulated gate bipolar transistors, and the development of the “integrated gate controlled thyristor” technology. Currently also acting as “vice director technology” of the Swiss Nanoscience Institute at the University of Basel.
Information Technology (Panel 18)

Jeffrey Ullman, Stanford University, USA (Chair)
Liam Bannon, University of Limerick, Ireland
Orna Grumberg, TECHNION - Israel Institute of Technology, Israel
Dale Miller, INRIA Saclay - Île-de-France, France
Michael O’Boyle, University of Edinburgh, United Kingdom
Reinhard Wilhelm, Saarland University, Germany
Martina Zitterbart, Karlsruhe Institute of Technology, Germany
Erik Sandewall, Linköping University, Sweden

Panel guides: Björn Gembert and Mikael Gerhardsson, Uppsala University

Chair presentation

Jeffrey Ullman

S. W. Ascherman Professor of Computer Science (Emeritus) at Stanford University, since 1994. PhD from Princeton University.

His interests include database theory, database integration, data mining, and education using the information infrastructure. His textbooks on compilers, theory of computation, data structures, and databases are regarded as standards in their fields.

He is one of the founders of the field of database theory, and was PhD advisor of an entire generation of students who later became leading database theorists, including Sergey Brin, one of the co-founders of Google. He served on Google’s technical advisory board and is currently the CEO of Gradiance.

Fellow of the Association for Computing Machinery and awarded the Knuth Prize. Co-recipient of the 2010 IEEE John von Neumann Medal.
Pharmacy (Panel 19)

William N. Charman, Monash University, Australia (Chair)
Mahmoud S. Ahmed, University of Texas Medical Branch, USA
Mikael Begtrup, University of Copenhagen, Denmark
Kim Brouwer, University of North Carolina at Chapel Hill, USA
David W. Grainger, University of Utah, USA
Ulrike Holzgrabe, University of Würzburg, Germany
Peter Kleinebudde, Heinrich-Heine University Düsseldorf, Germany
Kerstin Olsson, Swedish University of Agricultural Sciences, Sweden

Panel guides: Eva Andersson Björkman and Anders Alderborn, Uppsala University

Chair presentation

William N. Charman

Dean, Faculty of Pharmacy and Pharmaceutical Sciences, and Director, Monash Institute of Pharmaceutical Science at Monash University, Australia. PhD from the University of Kansas.

Research has been characterised by a multidisciplinary and collaborative approach to address major issues in drug discovery (especially for neglected diseases such as malaria), drug delivery and the pharmaceutical sciences. Recent highlights include the establishment of the Centre for Drug Candidate Optimisation (CDCO), the collaborative design of several new drug candidates for malaria.

He has led a strategic redevelopment of the faculty, now the largest pharmacy and pharmaceutical sciences program in Australia with over 1200 undergraduate and 130 PhD students.

Recipient of the GlaxoWellcome International Achievement award in Pharmaceutical Sciences, and Drug Discovery Project of the Year awards from the Medicines for Malaria Venture (Geneva) three times. Elected a Fellow of the American Association of Pharmaceutical Scientists. He is currently Chairman of the Wellcome Trust Seeding Drug Discovery Committee and was previously advisor to the World Health Organisation.
Pre-clinical research (Panel 20)

Tomas Lindahl, Cancer Research UK LRI, United Kingdom (Chair)
Stephen Ashcroft, University of Oxford, United Kingdom
Xavier Estivill, Centre for Genomic Regulation (CRG), Spain
Jaap Joles, University Medical Center Utrecht, The Netherlands
Seppo Meri, University of Helsinki, Finland
Liliana Schaefer, Johann Wolfgang Goethe-University Frankfurt, Germany
Sven Enerbäck, University of Gothenburg, Sweden
Panel guide: Ulrika Huss Melin, Uppsala University

Chair presentation

Tomas Lindahl

Retired in 2010 as Director for the London Research Institute. PhD and Doctor of Medicine qualification from the Karolinska Institutet in Stockholm.

The Cancer Research UK London Research Institute, based at two locations: Lincoln’s Inn Fields and Clare Hall laboratories, is a biological research facility whose aim is to conduct research into the basic biology of cancer. Under the guidance of Tomas Lindahl, Clare Hall became a leading centre for studies of DNA repair, recombination and replication, cell cycle control and transcription.

He is a member of the Royal Society and the Norwegian Academy of Science and Letters. He was awarded the Royal Society’s Royal Medal (The Queen’s Medal) in 2007 and the Copley Medal in 2010.
Public Health and Caring Sciences (Panel 21)

Hanneke de Haes, University of Amsterdam, Academic Medical Center (AMC), The Netherlands (Chair)
Gary L. Albrecht, University of Illinois at Chicago, USA
Inger Ekman, University of Gothenburg, The Sahlgrenska Academy, Sweden
Andreas Gerber, Institute for Quality and Efficiency in Health Care, Germany
Matti Klockars, University of Helsinki, Finland
Håkan Eriksson, Karolinska Institutet, Sweden
Panel guide: Anders Jonsson, Uppsala University

Chair presentation

Hanneke de Haes

Professor of Medical Psychology, and Chair, Department of Medical Psychology, Academic Medical Centre/University of Amsterdam. PhD from University of Leiden.

Focus of research is medical communication, information provision, and screening for distress.

Member of the Scientific committees for Scientific Council Cancer, and Social Oncology, in the Dutch Cancer Society. Editorial work includes Psychologie & Gezondheid, and Social Indicators Research. Member of the European Association for Communication in Health Care, European Health Psychology, and American Association for Communication in Health Care. Recipient of the Wolter Goeman Award for her scientific contribution to the field of medical psychology.
Clinical Research (Panel 22A)

Peter Sleight, University of Oxford, United Kingdom (Chair)
Sven Britton, Karolinska Institutet, Sweden
Betty Diamond, The Feinstein Institute for Medical Research, USA
Bo von Schoultz, Karolinska Institutet, Sweden
Rajesh V. Thakker, University of Oxford, United Kingdom
Unnur Thorsteinsdóttir, deCode Genetics, Iceland
Martin Ritzén, Karolinska Institutet, Sweden

Panel guides: Anders Alderborn and Elizabeth Öberg Dehlin, Uppsala University

Chair presentation

Peter Sleight

Retired from the British Heart Foundation-sponsored Field Marshal Alexander Chair of Cardiovascular Medicine in 1994, but continues to work at the John Radcliffe Hospital, Oxford.

Recent research has concentrated on the prognostic value of measures of heart rate variability, the patho-physiological processes underlying the changes found in patients prone to ischaemic heart disease, heart failure and hypertension, and effects of music on autonomic control.

He was Chair of the ISIS Trials Group Steering Committee carrying out four very large trials of the treatment of heart attacks in 31 countries. He is past Chair/President of the World Hypertension League and British Hypertension Society. Recipient of the Galen Medal by the Society of Apothecaries, the International Aspirin Foundation Senior Award, and the Mackenzie Medal of the British Cardiac Society. In 2010 he was awarded the Gold Medal of the European Society of Cardiology.
Clinical Research (Panel 22B)

Krister Höckerstedt, University of Helsinki, Finland (Chair)
Marion de Jong, Erasmus MC Rotterdam, The Netherlands
Caj Haglund, Helsinki University Central Hospital, Finland
Michael Hallek, University of Cologne, Germany
David Kerr, University of Oxford, United Kingdom
Ola Didrik Saugstad, University of Oslo, Norway
Robert Hahn, Linköping University, Sweden

Panel guide: Anita Ericsson, Uppsala University

Chair presentation

Krister Höckerstedt

Emeritus Professor of Surgery and Head of the Clinic for Transplantation and Liver Surgery, Department of Surgery, University of Helsinki, Finland. Specialist in general surgery and gastrointestinal surgery.

Research interests: Critical diseases of the gastrointestinal tract, pathophysiology of the liver, options of liver surgery, transplantation issues of the liver and kidneys; ischemia and reperfusion, rejection and infection.

Former President of the European Surgical Association, General secretary of the European Society of Surgical Research, Scandinavian Transplantation Society, Council member of the European Association for Study of the Liver, Chairman of Scandiatransplant.
Neuroscience (Panel 23)

Heikki Rauvala, University of Helsinki, Finland (Chair)
Juha Rinne, University of Turku, Finland
Arne Schousboe, University of Copenhagen, Denmark
Eva Syková, Academy of Sciences of the Czech Republic, Czech Republic
Peter J. Tyrer, Imperial College London, United Kingdom
Ola Hermanson, Karolinska Institutet, Sweden

Panel guide: Krister Halldin, Uppsala University

Chair presentation

Heikki Rauvala

Professor and Director of The Neuroscience Center, an independent research and teaching institute at the University of Helsinki, Finland.

Research includes cell surface and extracellular matrix molecules in neuronal development, plasticity and disorders. His group focuses on mechanisms of neuronal development and plasticity. Based on neurite outgrowth assays, they have previously isolated, cloned, and produced as recombinant proteins two ligands of heparan sulfate proteoglycans, HB-GAM (heparin-binding growth-associated molecule; pleiotrophin) and HMGB1 (high-mobility group B1; amphoterin).

Senior Member of the Center of Excellence of Molecular and Integrative Neuroscience. Member of the American Neuroscience Association.
Immunology, Genetics, Pathology (Panel 24)

Sirpa Jalkanen, University of Turku, Finland (Chair)
John Armour, University of Nottingham, United Kingdom
Jörg Hoheisel, German Cancer Research Center (DKFZ), Germany
Giorgio Parmiani, San Raffaele Scientific Institute, Italy
Antonio Secchi, Vita-Salute San Raffaele University, Italy
Olli Silvennoinen, University of Tampere, Finland
Mef Nilbert, Lund University, Sweden

Panel guide: Sofia Wretblad, Uppsala University

Chair presentation

Sirpa Jalkanen

Professor of Immunology and Director of the Center of Excellence in Host Defence Research, MediCity Research Laboratory, University of Turku, Finland, since 2007. Vice Dean of the Medical Faculty since 2010.

Current topics include Enzymatic and adhesive properties of vascular adhesion protein-1 (VAP-1); Targeting lymphocyte and endothelial cell functions during the development of diabetes; Homing properties of tumor infiltrating lymphocytes; Enzymatic and adhesive properties of CD73; and Identification of molecules involved in lymphocyte exit from the lymph nodes.

Appendix F. Instructions to departments for the planning of panel site visits

Note: The following instructions were distributed to the departments some months before the panel site visit.

The panels will visit the departments during Tuesday, Wednesday and Thursday in the respective weeks (week 19 or 20 depending on panel, see Appendix G). Monday will be reserved for an introductory session and panel work planning, and Friday is used for panel report finishing and exit interview, where the main conclusions are presented to deans and heads of department. The panel evaluation is concluded at lunch on Friday.

The departments are invited to participate in the planning of the site visits.

A time plan has to be established to allocate time for discussions of the various research activities included in the evaluation. The time schedule has to be made in accordance with the schedule shown in the table below. A 10 min break between different research activities or laboratory visits is recommended. The plan needs to be negotiated within the departments respectively between departments in order to satisfy the various research groups (see Appendix G for distribution of departments on panels). The faculty/section management is responsible for the final schedule.

Remember that the panelists are expected to be updated on the department’s research through the written summaries. The panel chair will be in charge of the evaluation at the visit, and he/she will decide on the format of the interviews. The head of department or other assigned person may start with a brief introduction to outline the structure of research activities, but one should not plan a tight schedule of presentations. Instead one should be prepared to discuss items that are brought up by the panel and make short presentations when asked for. Individuals thus need to be prepared to be available to the panels for discussions. The selection of individuals to be present at the various panel interviews is done by the departments.

The departments need to provide a list of the researchers associated with the respective sub-sessions to the panelists when they arrive. The individuals that will be present should be marked in the list. Also, the individuals appearing in the panel meetings should have a clearly visible name badge, last name in big capitals recommended. A “panel guide” from the university administration will be accompanying each panel from the hotel in the morning and assist in various matters during the site visit.

In order to give opportunities for contact with faculty and research students it is suggested to use lunch and coffee breaks. For example, one could plan for a
mingle session with coffee after the panel members have had lunch. The evaluation project can only support lunch and coffee for the panel members, but if the departments find a possibility to offer common lunch with research staff it might be of benefit for contact. It is suggested that catering service working lunch is offered, but the department is certainly encouraged to find other ways to organize lunch and coffee breaks. A sum of 200 SEK per panel member (incl. panel guide) and day can be provided from the evaluation project budget to support lunch and coffee for the panel members.

The departments need to have available at least two copies of the publications that have been listed (question A4, A5) in the evaluation document, including books. Also, material needed to qualify the quantitative information given in the B section of the evaluation document may be needed. It is recommended that provisions to meet panelists’ needs of borrowing computers with internet access are made, and that printing facilities are available. Since the panel will need to have internal meetings during the day a suitable room is required. If possible, the meeting room used for the interviews and discussions can be used also for this.

The exit interview on Friday is meant to communicate the main conclusions of the panel to deans and heads of department.

The departments will be given the opportunity to comment upon the panel evaluation report, for factual errors, before it is included in the final report.

**Summary of tasks by departments needed for the site visit planning.**

- Time schedule for the appearances of researchers from the different research areas of the panel during Tuesday, Wednesday, Thursday; 09:00 – 15:00, in the week of the site visit.
- Lists of researchers (those with presence at panel interview marked) for the different research areas made available at the beginning of the visit.
- Name badges with last name in clearly visible capital letters for all who appear at panel interviews.
- Arrangement of lunch and coffee for the panelists (Tuesday, Wednesday, Thursday).
- Meeting room available to the panel for internal meeting, if possible with access to computer and printing facilities.
- Two copies of the selected publications listed in the evaluation document (question A4 and A5) easily available to the panelists during the department visit.

The departments are asked to submit to the dean a coarse schedule for the panel visits in accordance with the above as early as possible. A final proposal for the panel schedule (Tuesday–Thursday) should be sent to kof@adm.uu.se by April 10 at the latest. The schedule will then be presented to the panel chair for comments.
<table>
<thead>
<tr>
<th>Day</th>
<th>Event</th>
<th>Time</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday</td>
<td>Meeting of Chairs and Swedish panelists</td>
<td>18:00–19:30</td>
<td>Hotel</td>
</tr>
<tr>
<td></td>
<td>Informal get-together buffet</td>
<td>19:30–</td>
<td>Hotel</td>
</tr>
<tr>
<td>Monday</td>
<td>Registration</td>
<td>09:30–</td>
<td>Hotel</td>
</tr>
<tr>
<td></td>
<td>Welcoming and KoF11 introduction</td>
<td>10:30–12:00</td>
<td>Hotel</td>
</tr>
<tr>
<td></td>
<td>Lunch</td>
<td>12:00–13:30</td>
<td>Hotel</td>
</tr>
<tr>
<td></td>
<td>Introductions from deans/vice-rectors</td>
<td>13:30–15:00</td>
<td>Hotel</td>
</tr>
<tr>
<td></td>
<td>Coffee</td>
<td>15:00–15:30</td>
<td>Hotel</td>
</tr>
<tr>
<td></td>
<td>Planning of panel visits, panels</td>
<td>15:30–17:00</td>
<td>Hotel</td>
</tr>
<tr>
<td></td>
<td>Welcome reception</td>
<td>18:30–</td>
<td>University Hall</td>
</tr>
<tr>
<td>Tuesday</td>
<td>Department visit incl. lunch</td>
<td>09:00–15:00</td>
<td>Departments</td>
</tr>
<tr>
<td></td>
<td>Internal panel meeting</td>
<td>15:00–17:00</td>
<td>Dept (or hotel)</td>
</tr>
<tr>
<td></td>
<td>Vice-chancellor’s dinner</td>
<td>18:30–</td>
<td>Norrlands</td>
</tr>
<tr>
<td>Wednesday</td>
<td>Department visit incl. lunch</td>
<td>09:00–15:00</td>
<td>Departments</td>
</tr>
<tr>
<td></td>
<td>Internal panel meeting</td>
<td>15:00–17:00</td>
<td>Dept (or hotel)</td>
</tr>
<tr>
<td></td>
<td>Panel dinner</td>
<td>18:00–19:00</td>
<td>Hotel</td>
</tr>
<tr>
<td></td>
<td>Internal panel meeting</td>
<td>19:00–</td>
<td>Hotel</td>
</tr>
<tr>
<td>Thursday</td>
<td>Department visit incl. lunch</td>
<td>09:00–15:00</td>
<td>Departments</td>
</tr>
<tr>
<td></td>
<td>Internal panel meeting</td>
<td>15:00–17:00</td>
<td>Dept (or hotel)</td>
</tr>
<tr>
<td></td>
<td>Panel dinner</td>
<td>18:00–19:00</td>
<td>Hotel</td>
</tr>
<tr>
<td></td>
<td>Internal panel meeting</td>
<td>19:00–</td>
<td>Hotel</td>
</tr>
<tr>
<td>Friday</td>
<td>Internal panel meeting</td>
<td>–10:30</td>
<td>Hotel</td>
</tr>
<tr>
<td></td>
<td>Exit interview, panel+dean+dept head</td>
<td>10:30–11:45</td>
<td>Hotel</td>
</tr>
<tr>
<td></td>
<td>Summing up. End of visit</td>
<td>11:45–12:15</td>
<td>Hotel</td>
</tr>
<tr>
<td></td>
<td>Optional lunch for panelists</td>
<td>12:15–</td>
<td>Hotel</td>
</tr>
<tr>
<td></td>
<td>Panel Chair meeting (+deans+vice-rectors)</td>
<td>14:00–17:00</td>
<td>Hotel</td>
</tr>
</tbody>
</table>
Appendix G. Site visits

It was decided that the panel visits should take place during two consecutive weeks, in May according to the panel list below. A separate chair meeting took place in the end of each site visit.

Site visits 9–13 May

Panel 2
Dept of Business Studies
Dept of Social and Economic Geography
Dept of Informatics and Media

Panel 8 (Aesthetics - Philosophy)
Dept of Philosophy
Dept of Art History
Dept of Literature
Dept of Musicology
Centre for Gender Research

Panel 9 (History - Anthropology)
Dept of Economic History
Dept of History
Dept of History of Science and Ideas
Dept of Cultural Anthropology and Ethnology
Dept of Archaeology and Ancient History
Dept of ABM [Archives, Libraries, Museums]
The Hugo Valentin Centre

Panel 10
Dept of Law

Panel 11
Dept of Theology

Panel 12
Dept of Mathematics
Dept of Information Technology - partly Centre for Image Analysis (included in Dept of IT from Jan 2011)

Panel 14
Dept of Biochemistry and Organic Chemistry
Dept of Photo Chemistry and Molecular Science
Dept of Physical and Analytical Chemistry
Dept of Materials Chemistry

Site visits 16–20 May

Panel 1
Dept of Economics
Dept of Statistics

Panel 3
Dept of Sociology
Dept of Food, Nutrition and Dietetics
Dept of Education
Dept of Curriculum Studies
Dept of Studies in Education, Culture and Media

Note: The latter three departments organized in a joint “Dept of Education” from 1 Jan 2011

Panel 4
Dept of Government
Dept of Peace and Conflict Research
Uppsala Centre for Russian and Eurasian Studies
Institute for Housing and Urban Research

Panel 5
Dept of Psychology

Panel 6 (Modern Languages - Linguistics and Literary Science)
Dept of English
Dept of Linguistics and Philology - partly
Dept of Modern Languages
Dept of Scandinavian Languages - partly

Panel 7 (Early Languages and Cultures)
Dept of Linguistics and Philology - partly
Dept of Scandinavian Languages - partly

Panel 13
Dept of Physics and Astronomy

Panel 16
Dept of Earth Sciences
## Site visits 9–13 May, cont.

**Panel 15**  
Dept of Ecology and Genetics  
Dept of Organismal Biology  
Dept of Cell and Molecular Biology

**Panel 17**  
Dept of Engineering Sciences

**Panel 18**  
Dept of Information Technology - partly

**Panel 19**  
Dept of Medicinal Chemistry  
Dept of Pharmaceutical Biosciences  
Dept of Pharmacy

**Panel 22B (Clinical research)**  
Dept of Surgical Sciences  
Dept of Radiology, Oncology and Radiation Science  
Note: Clinical Immunology included in Dept of IGP (panel 24) from 1 Jan 2011

**Panel 24**  
Dept of Immunology, Genetics and Pathology (IGP)  
Ludwig Institute for Cancer Research

## Site visits 16–20 May, cont.

**Panel 20 (Pre-clinical research)**  
Dept of Medical Biochemistry and Microbiology  
Dept of Medical Cell Biology

**Panel 21**  
Dept of Public Health and Caring Sciences

**Panel 22A (Clinical research)**  
Dept of Medical Sciences  
Dept of Women’s and Children’s Health

**Panel 23**  
Dept of Neuroscience  
Dept of Public Health and Caring Sciences - partly
Appendix H. Results of questionnaire

At the end of the site visit all panels/panellists received a short questionnaire. The first part was a voluntary free response section and the responses are summarized here. 56 of the 110 respondents made comments for one or several of the questions. Similar opinions expressed by more than two respondents are in bold letters!

Free response section, summary

Things you liked MOST at/with KoF11:

• It was a very rewarding and valuable exercise
• I was sceptical beforehand, but felt this worked effectively
• Extremely stimulating intellectual climate, excellent environment
• Collegial panel/teamwork and most Uppsala staff enthusiastic, enjoyed dialogue with panellists
• The opportunity to learn about the many research projects at Uppsala University, and to talk with colleagues in the departments and the panel
• Very interesting and intense discussions on research and the evaluation of research
• Opportunity to interact with doctoral students and junior faculty in informal discussions
• Welcome and hospitality from university
• General organisation, excellent support and guidance

Things you liked LEAST at/with KoF11:

• An incredibly intensive and exhaustive experience (but I guess this is difficult to change)
• Hard work, tight/heavy time schedule – no time to be alone
• 12-hour days (but our panel got the report writing done while here)
• More times invested than necessary (3 days would do)
• Nothing negative – but the general enthusiasm of the participants meant too much time was spent on presentations with rather too little for discussion of the context in which people work – which external panels need time to assimilate
• Little time to consolidate the report on-site
• Little inter-panel interaction
• Better coordination needed with related panel (e.g., 8 and 9) to standardize our grading
• Too many presenters talked too much about conditions for research and too little about the research itself and its international impact
• Lack of consistency in preparations by departments, reports inconsistent and so were the presentations
• Poor presentations and unpreparedness of some staff being evaluated
Part V: Appendices

Appendix H

- The application of parameters from the natural sciences, economics, etc. on the humanities (particularly the fetish of bibliometrics)
- Purpose of exercise not fully clear
- Far too early dinners (and having to work after)
- The lengthy introduction on Monday morning
- Processing of reimbursements

Make SPECIFIC proposals or remarks – for us to be able to improve future site visits

- Keep it as it is - very efficient and objective evaluation
- An alternative approach could be for the panel to prepare a preliminary report before the visit so that questioning could be more focused
- Plan to have some time to talk to people from related areas (both university staff and panel members) at short notice
- Next time have a poster session by staff and PhD’s after a general short introduction by leading scientist/professor
- Ensure the units evaluated that the evaluation is meant to be helpful, not to cut jobs and downsize (this fear was obvious in some cases)
- More time to meet and discuss with doctoral students
- Just allow more time for discussion
- More targeted briefing for panel chairs, with information on panel practices that worked well (organising of work producing report etc.)
- Provide full list of publication divided into refereed journal articles, books, etc.
- Needed CV, research topics and publication lists of all members of each department
- I could perhaps also suggest considering providing unified bibliographic/citation impact (H-index) for simple guidance
- The statistics (part C) was not enough detailed – provide more data on groups
- Provide detailed information about final teaching load per staff member
- It would be nice if the departments could be encouraged/asked to present their research projects to the panels in a more accessible way. There could for example be webpages about the projects, which the panellists could look at
- It would be useful to have selected publications from each unit on the website before the site visit
- Reconsider panel division (panel 6 and 7)
- Nothing planned for Thursday evening. We would have liked to see the new Uppsala Concert Hall, perhaps with a short performance
- Next KoF should be further away than four years!

The second part was a fixed response section and the responses are summarized here. 110 out of 192 (57%) of the visiting panellists completed this section (though some panelists did not respond to each and every one of the statements below). We received answers from 20 of the 25 panels, from all faculties and
from both visit weeks. This was comparable to the numbers from the KoF07 questionnaire.

### Fixed response section, summary

<table>
<thead>
<tr>
<th>Statement</th>
<th>5 Strongly Agree</th>
<th>4 Neither</th>
<th>3 Disagree</th>
<th>1 Strongly disagree</th>
<th>Aver. KoF11</th>
<th>Aver. KoF07</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information before the site visit (website, mail, etc.) was satisfactory</td>
<td>28%</td>
<td>59%</td>
<td>10%</td>
<td>3%</td>
<td>4.1</td>
<td>3.7</td>
</tr>
<tr>
<td>The Internet portal was easy to use and information accessible</td>
<td>18%</td>
<td>60%</td>
<td>17%</td>
<td>3%</td>
<td>3.9</td>
<td>4.0</td>
</tr>
<tr>
<td>Answers to your requests (by mail, etc.) were satisfactory</td>
<td>40%</td>
<td>53%</td>
<td>7%</td>
<td>0%</td>
<td>4.3</td>
<td>4.5</td>
</tr>
<tr>
<td>The department evaluation documents (part A, B, C) covered the research activities reasonably well</td>
<td>11%</td>
<td>59%</td>
<td>11%</td>
<td>18%</td>
<td>3.6</td>
<td>3.7</td>
</tr>
<tr>
<td>Your panel had the necessary competencies needed for the review</td>
<td>52%</td>
<td>45%</td>
<td>1%</td>
<td>1%</td>
<td>4.5</td>
<td>4.4</td>
</tr>
<tr>
<td>You had enough time to cover and assess the research on-site</td>
<td>25%</td>
<td>51%</td>
<td>8%</td>
<td>10%</td>
<td>3.8</td>
<td>4.0</td>
</tr>
<tr>
<td>The presentations (Tuesday–Thursday) were according to your need</td>
<td>18%</td>
<td>64%</td>
<td>11%</td>
<td>7%</td>
<td>3.9</td>
<td>4.1</td>
</tr>
<tr>
<td>The time schedules (Tuesday–Thursday) were kept</td>
<td>39%</td>
<td>51%</td>
<td>6%</td>
<td>4%</td>
<td>4.3</td>
<td>4.4</td>
</tr>
<tr>
<td>There was sufficient time available for discussion</td>
<td>26%</td>
<td>51%</td>
<td>7%</td>
<td>15%</td>
<td>3.9</td>
<td>3.8</td>
</tr>
<tr>
<td>Information provided during the site visit was satisfactory</td>
<td>28%</td>
<td>52%</td>
<td>13%</td>
<td>7%</td>
<td>4.0</td>
<td>N/A</td>
</tr>
<tr>
<td>The support from staff (Academic Conferences, Student Staff) was satisfactory</td>
<td>75%</td>
<td>22%</td>
<td>3%</td>
<td>0%</td>
<td>4.7</td>
<td>N/A</td>
</tr>
<tr>
<td>The arrangements (Tue–Thu) were satisfactory (rooms, lunches, etc.)</td>
<td>63%</td>
<td>34%</td>
<td>3%</td>
<td>0%</td>
<td>4.6</td>
<td>4.5</td>
</tr>
<tr>
<td>To participate in the evaluation was valuable to yourself</td>
<td>48%</td>
<td>44%</td>
<td>8%</td>
<td>0%</td>
<td>4.4</td>
<td>4.4</td>
</tr>
<tr>
<td>The feedback and report from your panel will be of great value to Uppsala University</td>
<td>21%</td>
<td>60%</td>
<td>19%</td>
<td>0%</td>
<td>4.0</td>
<td>4.2</td>
</tr>
<tr>
<td>The report template was useful</td>
<td>22%</td>
<td>65%</td>
<td>10%</td>
<td>3%</td>
<td>4.1</td>
<td>4.1</td>
</tr>
</tbody>
</table>
Appendix I. Photographs
From the welcome reception in the university building. Upper left on facing page: Professor Anders Hallberg, Vice-Chancellor of Uppsala University, welcomes the panellists (photos: Jim Elfström).
Facing page: Panel members of the 9–13 May visit outside the entrance of the university building. (photo: Jim Elfström).

Right: Panel members of the 16–20 May visit outside the entrance of the university building. (photo: Jim Elfström).
From the site visit by panel 6 (photos: Mikael Wallerstedt).

Above: Professor Robert Appelbaum (standing) and colleagues present the research in English Literature and Culture at the Department of English.

Upper on facing page: Linnéa Anglemark at the Department of English (left) shows a poster to Ernst Håkon Jahr, professor at University of Agder, and Gunnel Tottie, professor at University of Zürich, at the poster session at the Department of Scandinavian Languages and the Department of English.

Lower on facing page: Gernot Windfuhr, professor emeritus at University of Michigan, at the poster session at the Department of Scandinavian Languages and the Department of English.

Next page: From left, Susan Bassnett, professor at University of Warwick, Eva Haettner Aurelius, professor at Lund University, Roland Marti, professor at Saarland University, and Riho Grünthal, professor at University of Helsinki, visiting the Department of English.