ANNUAL REPORT 2006

ACADEMY OF FINLAND

RESEARCH FUNDING AND EXPERTISE

Contents

Charting the way ahead

Raimo Väyrynen, President

2006 was a year of intense activity in science policy, both domestically and internationally. The Science and Technology Policy Council of Finland adopted the report *Science, Technology, Innovation*, which charts the way ahead for Finnish science policy, its goals and resources. With respect to basic research, the key priorities are to increase competitive research funding and core funding for universities, to promote research careers and to develop scientific infrastructures. The performance of basic research is also crucial to the success of Strategic Centres for Science, Technology and Innovation envisaged for establishment in Finland.

Internationally, the most important science policy news of the year was the adoption of the EU's Seventh Framework Programme for research and technological development and the simultaneous launch of the European Research Council. The Academy also made good progress with its bilateral international cooperation, and several joint research programmes were set up with funding agencies in Canada, China, India, Japan and Russia. The bibliometric survey published by the Academy in late 2006 provided further confirmation that Finnish science is continuing to gain a stronger international position.

The Board of the Academy adopted a new strategy that details the Academy's objectives and the means for their achievement through to 2015. The strategy identifies high quality as a priority criterion in funding decisions, stresses the importance of strategic collaboration with universities and highlights the need to enhance the societal impacts of research. An impact assessment of Academy funding by a panel of experts headed by Professor Jussi Huttunen applauded the Academy for its excellent work and submitted some constructive proposals for change. The same goal of achieving greater impact is shared by the IndAca project for the promotion of intersectoral mobility among researchers.

A concrete illustration of the Academy's collaboration with universities is provided by the Finland Distinguished Professor Programme, which was launched jointly with Tekes – Finnish Funding Agency for Technology and Innovation. Academy funding for the programme amounted to 10.6 million euros. This will go towards financing 16 leading international researchers working long-term in Finland in key strategic areas identified by universities.

Another example of Academy-Tekes cooperation is FinnSight 2015, the first ever comprehensive science and technology foresight project in Finland based on primary analysis. The panel members represented a breadth of expertise, with project themes ranging from human communication to materials and service innovations.

Work was continued to streamline the Academy's internal operations. The Administration Office oversaw the smooth changeover to entirely use online application procedure. Preparations also continued for changes in the application review process. There seems to be no let-up in the volume of applications received, yet the central government productivity programme threatens to cause substantial reductions in Academy staff. For this reason it is necessary to continue efforts to rationalise the review process without compromising its quality and credibility.

A new unit was set up at the Academy to assume responsibility for the preparation of matters concerning Centres of Excellence and research programmes, for the submission of these matters to the Board of the Academy, as well as for the implementation and monitoring of these programmes.

A new Board and new Research Councils started at the beginning of 2007. It is time to thank all the members of the old Board and Councils for their dedicated efforts and valuable contribution to the success of the Academy and Finnish science. Warm thanks are also due to staff at the Academy's Administration Office. 2006 was a good and successful year for the Academy, in every respect.

The year 2006 in review

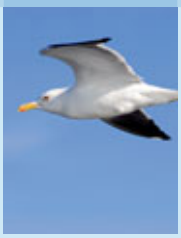
January

The Academy received 3,007 applications for research funding in the January call. The largest category was represented by applications for general research grants. Most applications were submitted to the Research Council for Natural Sciences and Engineering, followed by the Research Council for Culture and Society.

Letters of intent were invited to five research programmes. The Research Programme on Nanoscience received 275 letters of intent; Power and Society in Finland 115; Sustainable Production and Products 127; and Substance Use and Addictions 65.

Overall, the Academy received 5,567 applications in 2006.

February



The Baltic Sea Research Programme ended. The programme helped to understand how the environmental problems facing the Baltic Sea can be resolved. It involved 24 research projects concerned with eutrophication and other environmental issues; fishing and fisheries; biodiversity; the Nordic dimension; environmental history; and environmental management in the Baltic rim.

The results show that coastal waters off the major cities along the Gulf of Finland began to deteriorate as early as the 19th century. Eutrophication levels were at their highest in the 1960s and 1970s, but since then the quality of coastal waters has improved with the reduction of external loads. Urban bays have still not recovered close to their natural state because the internal nutrient load continues to sustain eutrophication.

March

An evaluation by an international panel of experts concluded that food sciences and related research in Finland is of a very high standard. The panel particularly highlighted the high food safety standards and traceability of Finnish produce. Finnish nutrition research also received recognition.

According to the panel, research and product development in the food sector should invest greater effort in developing functional foods for the promotion of public health and the prevention of chronic disease.

April

The Academy's science competition for upper secondary students was won by Jyri Eskola with a study on methods for growing oats. The judges described his research as an excellent and flawless piece of work and his approach as innovative. He had designed the experimental setting himself.

The competition attracted 160 entries. A record number of upper secondary schools and students took part.

May

A total of 113 plans of intent were submitted for the national Programme for Centres of Excellence (CoE) in research in 2008–2013. In May, the Academy selected 44 of these to go through to the second round.

In December, the Academy selected 18 national Centres of Excellence. Eight of them are newcomers to the programme, ten have been involved in earlier programmes but have now updated their research plans.

A maximum of 26 million euros has been earmarked for CoE funding during the first three-year term.

Shown in the photo is Academy Professor Olli Kallioniemi, Head of the Centre of Excellence in Translational Genome-Scale Biology, with his group.

June

FinnSight 2015 offered a forward look at science and technology in Finland in the 2010s. Conducted jointly by the Academy and Tekes – Finnish Funding Agency for Technology and Innovation, the results of the foresight project were published in June.

The SIGHT 2006 project to assess and review the state, quality and impacts of Finnish science and research was conducted in 2005–2006. The project involved an assessment of the impacts of Academy research funding by the Academy's Research Councils and a national panel of outside experts.

July

The Scientific Council of the newly founded European Research Council (ERC) convened in Helsinki.

Charged with the mission of promoting frontier research in Europe, the ERC is funded through the EU Seventh Framework Programme. The research community and research funding agencies are waiting to see how the new funds will be spent.

In 2003–2006, more than one thousand projects were funded through the EU Sixth Framework Programme, including large numbers of Finnish research teams and business companies.

August

A report out in August by a panel of experts chaired by Professor Jussi Huttunen concluded that the Academy has been highly successful in its core mission of research funding.

According to the panel, the Academy has a well-defined and well-recognised role in the Finnish innovation system, providing key resources for basic research. The Academy is well-respected, and it receives exceptionally scarce criticism.

Academy funding has, according to the panel, helped to promote high-quality basic research as well as future-oriented strategic research at universities, government research institutes and health care units.

September

The Researchers' Night events provided an opportunity for the general public to learn about research and the researcher's job. Various events and exhibitions were organised where people could conduct their own experiments, try out experimental equipment, take part in quizzes, and even enjoy theatre and dance performances by researchers.

The events in six cities were coordinated by the Academy and organised by local universities. They were all part of the European Researchers' Night, a programme funded by the European Commission and involving more than 100 events in 20 countries.

October

The Academy's annual recognition and incentive awards were presented at the Science Gala in October. The Academy's Recognition Award went to Academy Research Fellow, Professor Teivo Teivainen from the University of Helsinki. The Incentive Award was presented to Academy Research Fellow, Docent Jyri-Pekka Mikkola from Åbo Akademi University.

Teivainen's main research interests lie in global democracy and international fairness. He has undertaken several case studies, particularly in Latin America.

Mikkola has been doing groundbreaking work in the field of ionic fluids, which is a new field of chemistry in Finland. He is convinced that, in the future, ionic fluids will have an impact on most chemical industry processes as well as on the energy industry.

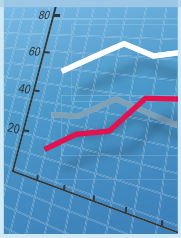
November

The projects selected to take part in the Power and Society in Finland Research Programme were announced in November. The programme will be exploring various dimensions of power in Finnish society.

Power and Society in Finland is one the Academy's new research programmes. Running through to 2010, it has been earmarked a budget of 6.5 million euros.

Shown in the photo is Programme Manager Petteri Pietikäinen.

December



A comparative bibliometric analysis published by the Academy shows that Finnish science ranks among the top OECD performers in terms of publication and citation counts.

The number of publications by Finnish researchers in international scientific journals has increased 2.5-fold during the past 20 years, and now stands at an all-time high. Relative to population and GDP, Finland is one of the world's biggest publishers.

Science assessment and foresighting: growing needs and demands

The impact and effectiveness of science and technology policy and research funding are a subject of ongoing debate and discussion in all advanced countries. The importance of impact assessment is underscored by the widespread adoption in OECD countries of knowledge-based strategies as well as by the rapid growth of research funding.

In carrying out their mission universities shall, according to the Finnish University Act, promote the social impact of research findings. The Government resolution on the structural development of the public research system also emphasises the role of impact assessment. Indeed, the main criterion specified for the collaboration among funding agencies is to gain an increased impact for research funding.

One of the Academy's key missions is to promote scientific research and the application of its results. One of the central themes in the new strategy adopted by the Academy in October 2006 is the impact of science and research.

In 2006, the Academy completed a major evaluation and development programme. SIGHT 2006 provided an assessment of the state, quality and impact of Finnish science at three levels: the research and innovation system, the Academy's organisation and the Academy's funding instruments. At the same time the aim was to move towards an integrated system of foresighting and assessing the impacts of research and innovation. The results of the projects were reported in 13 publications (page 42).

First foresight project of its kind in Finland

FinnSight 2015 is the most extensive foresight exercise conducted in Finland and the first ever project of its kind in the field of science and technology. Its remit was to define specific areas of competence that it was thought could have a major impact on the competitiveness of Finnish business and industry and on national welfare in general.

The foresight project was a joint undertaking by the Academy of Finland and Tekes – Finnish Funding Agency for Technology and Innovation. A total of 120 experts working in ten high-level panels identified 80 focus areas of competence.

The results of FinnSight 2015 have provided important strategic direction for the work of both the Academy and Tekes. They have also served as a knowledge base for the development of Strategic Centres for STI.

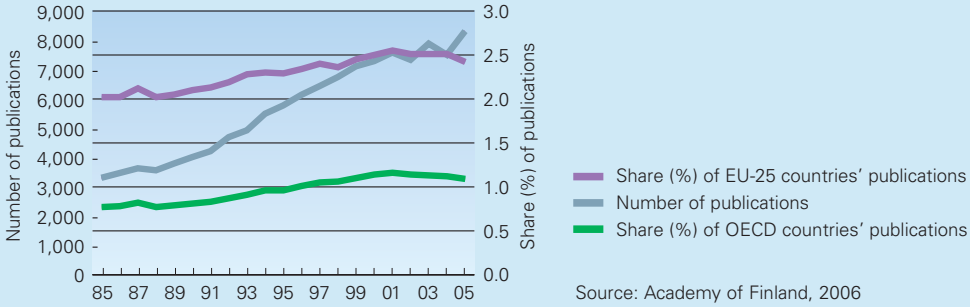
Evaluation demonstrates the level of science in Finland

The Academy assesses the scientific and social impact of research at the research system level. In addition to peer evaluations, assessments of scientific impact also make use of bibliometric methods. According to an international comparison published by the Academy in 2006, scientific publishing in Finland has developed very favourably. Relative to both population and GDP, Finland ranks fourth among all OECD countries. Science in Finland is of a much higher quality than in the OECD countries on average, and its quality is continuing to improve.

Among the major fields of science, Finnish agricultural sciences and medical sciences are at a significantly higher level than the OECD average. Internationalisation has progressed favourably since the 1990s. In particular, Finnish universities have much more international collaboration now with foreign universities and research institutes.

The impact of Academy research funding was evaluated in a modified peer assessment process. The assessment was conducted by a panel of outside experts under the chairmanship of Professor Jussi

Figure 1: Number of Finnish scientific publications and share of EU-25 and OECD publications in 1985–2005



Source: Academy of Finland, 2006

Huttunen, Director-General Emeritus of the National Public Health Institute of Finland. According to the assessment, the Academy has been highly successful in its mission, and it has an influential role as part of the national innovation system.

The panel recommends that the level of Academy research funding be increased. Additional resources should be allocated first and foremost to general project funding, funding to support research careers, infrastructure support and overheads grants. Scientific quality and innovativeness must remain the main criteria in the allocation of research funding. Social impact and the needs of society should be better reflected above all in the selection of research programmes and graduate schools.

The Academy's Research Councils conducted assessments in 2005–2006 of the impacts of research and research funding within their respective fields. These assessments focused on the nature of impact mechanisms and processes in general, but also involved more detailed analyses of the impacts of the Academy's funding instruments.

The results of these assessments reinforce the view that in an advanced research and innovation system such as Finland's, impact is created above all through interaction. Indeed, one of the hallmarks of an effective research and innovation system is the free and unrestrained movement of knowledge and experts. The Academy's position is that the mobility of experts in particular should be further enhanced.

The problems are thought to lie in the structures of knowledge production and competence, which are in need of reform. The structural problems on the demand side of knowledge and expertise have so far received less attention. The key to addressing these problems, as indeed to the challenge of enhancing impact, lies in strategic collaboration among different stakeholders within the research and innovation system. As far as funding agencies are concerned, this collaboration has yielded excellent results both in internationalisation, research and Centre of Excellence programmes and in the development of Strategic Centres for Science, Technology and Innovation. The Academy wants to see this collaboration extended to potential end-users of knowledge.

The assessments furthermore show that the best way to achieve high-quality impact, often at low input cost, is through the setting of clear targets and careful advance preparation.

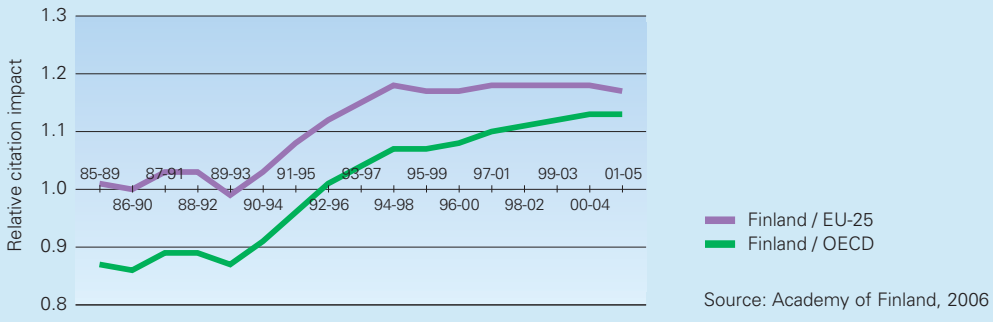
On average, Academy funding is more cost-effective than other academic research in producing scientific publications and degrees, and doctoral degrees in particular. It is surprising that even though Academy-funded projects in the natural sciences and engineering are essentially basic research, they have great application and industrial value. This is reflected both in direct applications and in the number of patent applications and patents issued. All this suggests that the innovation process has clearly speeded up in recent years and that there is now a closer link between basic research and innovations. (For more on the Research Council's impact assessments, see pages 25–36.)

Work to improve review and evaluation processes set to continue

International peer reviews are the most important tool used by the Academy to identify the best and most promising research projects. Funding decisions are based on statements obtained mainly from panels of experts. Each year more than one thousand experts are involved in reviewing applications submitted to the Academy.

In addition, several foreign experts are recruited each year to evalu-

Figure 2: Development of Finland's citation impact compared to EU-25 countries and OECD countries in 1985–2005



Source: Academy of Finland, 2006

ate recently completed Academy research programmes and the work and structure of various disciplines and fields of research. These evaluations also take in the national graduate school arrangements.

Assessments of the impact of research funding have gained increasing significance in recent years. The Academy is committed to further developing its review and evaluation processes through a dedicated team set up within its organisation and to seek alternative ways of conducting its evaluations.

The Academy has contributed actively to the debates and discussions within Nordic workshops and European seminars on how to develop the evaluation of research projects. Many of the challenges facing assessment are the same for all funding agencies. International comparisons have shown both where the Academy's strengths lie and which areas have potential for development.

Applications for research grants submitted to the Research Council for Health were reviewed in 2006 by a panel of experts who shared a similar research background. The Research Council for Health also worked closely with the Swedish Research Council, the Academy's sister organisation in Sweden, in reviewing its postdoctoral researcher applications.

The Academy assessed the impacts of the changeover to online services and the reform of its funding instruments on the applications review process and looked into ways of further streamlining the process of project reviews. Both the review form and the guidelines given to expert reviewers were simplified. This work will be continued in 2007. The aim is to make sure that the perspectives of multidisciplinary research and breakthrough research initiatives receive fuller consideration in the review process.

The changeover to online services, which included both the submission of applications, the retrieval of expert opinions, the processing of applications and reporting on the use of funds, was a key area of development for the Academy in 2006.

A major point of emphasis in this development effort was that high quality must always remain the ultimate goal of project reviews; that must not be jeopardised by any steps to streamline the review process.

The long tradition of evaluation

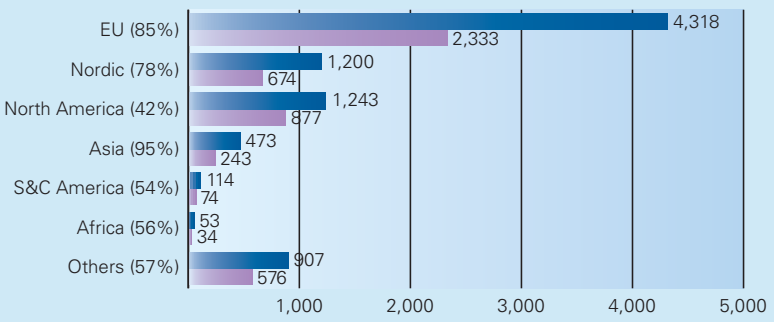
The Academy has systematically evaluated all the research programmes it has funded. In 1997–2006, a total of 26 research programme evaluations, mostly by foreign reviewers, have been published in the Academy's publication series.

The evaluation report on the Finnish Companies and the Challenges of Globalisation (LIIKE) programme was published in 2006. The year under review also saw the completion of programme evaluations on the Proactive Computing (PROACT), Microbes and Man (MICMAN) and the Baltic Sea (BIREME) research programmes. The reports are published in spring 2007.

The Academy has conducted assessments of individual disciplines and fields of research since 1983. In the past ten years it has published 14 such assessments, two of which were completed in 2006. International panels of experts evaluated Finnish research in the energy sector in 1999–2005 and Finnish food sciences and related research on nutrition and consumption in 2000–2004.

The Research Council for Health made preparations for an assessment of dental research in 2007. The Research Council for Natural Sciences and Engineering announced its decision to conduct an assessment of Finnish computer science in 2007.

Figure 3: Number of international co-publications by Finnish researchers in 1995 and 2004. Year-on-year change (%) is given in parentheses after each region.



Source: Academy of Finland, 2006
Data for these tables are drawn from the Thomson Scientific databases National Science Indicators 1981–2005 and National Citation Report 1995–2004.

In pursuit of genuine interactive collaboration

Tiina Mattila-Sandholm calls upon researchers to report their results in a way that can be readily understood in applied fields as well.

"Investment in basic research needs to be stepped up, and the research itself needs to be more concentrated. I'd also like to see more strategic direction for research. It's essential that we respond to the changing needs for research and researchers so that we can improve our national competitiveness. There can and must be a social demand for basic research, too."

These are the words of Tiina Mattila-Sandholm, Valio's Senior Vice President for R&D and Chair of the Research Council for Biosciences and Environment in 2004–2006. She will continue to serve on the Academy's Board in 2007–2009.

Mattila-Sandholm is keen to stress that the promotion of social impact is a matter of common concern on all sides, both for producers and end-users of knowledge and for the financiers of research.

Research programmes and Centre of Excellence programmes, she maintains, are a particularly useful steering tool, allowing financiers to target their investments on specific areas – either on emerging fields or on subjects otherwise considered important.

The initiatives for research programmes come from Research Councils, but the final decision to go ahead is made by the Academy's Board.

"For me personally, a major highlight during this past term was the Council's decision to conduct an evaluation of food sciences and related research. One of the goals was to obtain tools for strategic development in this sector. The evaluation instigated the launch of the Research Programme on Nutrition, Food and Health, and this work has now progressed to planning for a Strategic Centre for STI. I feel this same model should be applied in many other sectors as well."

Other ongoing research programmes mentioned by Mattila-Sandholm are the Baltic Sea Research Programme and the Research Programme on Environmental, Societal and Health Effects of Genetically Modified Organisms. Both have significant social impact.

The Council also afforded great importance to the nanosciences, substances and addictions as well as to sustainable production and products. Research programmes are now underway in all these fields.

The Council's commitment to international activity was most clearly evident in its involvement in European Science Foundation and ERA-NET projects. These offered an opportunity to find new multinational funding contacts and also to get involved in the strategic direction of research at a European level.

Increasing the impact of science requires genuine interaction. However, as is pointed out in the impact report commissioned by the Research Council, interaction alone is not enough. It is also necessary to have deeper collaboration, real interests in common, a common language and an ability to work together.

"For instance, if the desire is there, it's certainly possible to facilitate the collaboration between basic research and industry," Mattila-Sandholm says.

"It seems that academia isn't always aware of all the potential applications of knowledge. Industry, for its part, doesn't have a good enough understanding of the world of research." ■

Impact is a highly complex phenomenon

The standard of funding applications has risen, but at the same time competition for research funding has continued to intensify, says Professor Arto Mustajoki.

"Impact is a highly complex phenomenon in cultural and social research. It's much harder here than in other disciplines to define the scientific quality of research, let alone to measure innovativeness and social impact," says Professor Arto Mustajoki, outgoing Chair of the Research Council for Culture and Society.

Nevertheless, the Council decided to tackle the challenge and produce a report on the social impact of research.

"The report explores the concept of impact from a whole new angle. All in all, research in the humanities and social sciences has a huge impact on society, as it does on the way people view themselves and their environment. However, this easily goes unnoticed, if we content ourselves with simple measures and focus on the short term only."

According to Mustajoki, the aim is to get researchers to see and appreciate the significance of their own work. All research has a social impact, if it is viewed in a broad enough perspective.

A major focus for the Research Council has been on multidisciplinary research. "Our aim has been to make sure that all applications receive appropriate treatment and in this way to encourage researchers to tackle multidisciplinary themes. One of the ways to secure as competent reviews as possible is to set up joint panels across different disciplines and Research Councils."

In the field of cultural and social research, collaboration and interaction has been promoted among other things by organising workshops within the research community and meetings between researchers and end-users of knowledge.

"The launch of the Power and Society programme was attended by people who actually are in power, which helped to make it a genuine forum of debate and discussion. The event was tremendously popular and a great success. Some research programmes have also invited the media and other end-users of knowledge to attend their seminars," Mustajoki explains.

FinnSight 2015 was a particularly significant project: "Through its very diversity FinnSight created a whole new culture of foresighting. The ten themes covered included several significant issues, such as Learning and Learning Society and Understanding and Human Interaction, which rarely appear on these kinds of top ten lists for the future."

The Council considers it important to emphasise the key role that humans play not only in causing, but also in finding solutions to problems. "In many cases the human factor is the single most critical aspect, yet it is often overlooked", Mustajoki says, quoting the Baltic Sea as an example.

"The main focus of research aimed at saving the Baltic Sea is still on water, but more attention should be given to people's attitudes and actions and to the enforcement of environmental legislation in Russia. These factors have a crucial impact on the marine environment." ■

New funding instruments have pushed development in the right direction

Professor Riitta Keiski, Chair of the Research Council for Natural Sciences and Engineering in 2004–2006, says that the social impact of Academy-funded basic research in these fields is comparable to the impact of applied research.

A study on the impact of natural science and engineering disciplines found that within 1.5 to 5.5 years of the termination of funding, results from roughly every other project had been put to commercial or other application in business and industry. This in spite of the fact that the aim had been to generate new knowledge and science rather than practical applications.

"In our field, university education starts from the premise that even basic research can be problem-driven and lead to applications," Keiski says.

She describes the process of understanding impact as a learning curve that every scientist has to go through sooner or later. The intention now is to develop reporting practices in such a way that researchers learn through self-evaluation more deeply to analyse their own work and the impact of research.

The mobility of researchers from universities and research institutes into private business and industry, Keiski says, is a highly effective way of transferring knowledge and know-how into practice. In the past three years, the Academy has introduced a new funding instrument that promotes this kind of mobility.

"When business concepts and products are based on sound research knowledge and know-how, they are bound to succeed in the international marketplace and are less exposed to plagiarism," she continues.

The first postdoctoral researchers are now taking advantage of this new funding instrument and moving to work in industry. Doctoral thesis writers who are employed in business and industry, on the other hand, do not seem equally inspired by the idea of a spell in academia.

Understanding the impact of research is a learning curve that every scientist has to go through sooner or later, says Professor Riitta Keiski.

Keiski is keen to emphasise the importance of new breakthroughs and innovations. "Exciting things are happening at the interface of different disciplines. Whole new fields of research have been emerging, such as bio- and neuroinformatics."

"Highly innovative projects are also very interesting. At the application and start-up phase they're often high-risk projects. It's possible that they never lead to any significant results, but in the best case they can produce something totally unique."

Fields related to the IT industry have occupied a central position among the disciplines hosted by the Research Council. The pace of development in the IT industry has highlighted the need for speed and maximum flexibility in research funding, which is why targeted funding has become increasingly popular.

At the same time, this has released traditional research funding for use in other fields of research, which Professor Keiski considers a bonus.

"We're now in the position to put adequate investment into multidisciplinary research programmes, for instance, such as those on sustainable production and products and sustainable energy. It's expected that these programmes will produce important new innovations for Finnish business and industry." ■

Positive trends in development set to continue

There mustn't be too much direction. Researchers must have the freedom to do breakthrough research, Professor Kalervo Väänänen points out.

Professor Kalervo Väänänen, Chair of the Research Council for Health, is pleased with the standard of health research in Finland and with the results that have been achieved with Academy funding. "The positive trends in development that started a long time ago are still continuing," he says. Professor Väänänen chaired the Research Council in 2004–2006 and has been reappointed for 2007–2009.

"If we look at the number and quality of international publications, we're performing extremely well. Research has done a good job in terms of its social impact as well."

The intended area of application is reflected in one way or another in almost every funding application. Usually the purpose is to obtain new knowledge about the aetiology and development of some diseases and to improve diagnostics and methods of treatment.

"The Council has taken the firm view that open project funding is the bread and butter of basic research in this field. It's genuinely researcher-driven because the sole and exclusive criterion for the decision to grant funding is the applicant's and application's scientific merit."

"It's important that researchers can do things that genuinely interest them. There mustn't be too much direction. Researchers must have the freedom to do breakthrough research," Väänänen says. Without high-level basic research, he reminds us, there is no applied research.

The main source of concern for the Council has been the future of clinical research. The changes that are now sweeping the health care system, Väänänen points out, have reflected adversely on the research atmosphere. This has made it more difficult for university hospitals and research to work together.

Three years ago the Research Council decided to try and seriously address these problems, as this is one of the main strength areas of Finnish health research. This led to the introduction of a funding mechanism that allows junior and slightly more advanced researchers to divide their time between research and clinical work. The first funding decisions were made in 2006, and results are expected within the next few years.

Health research has invested in internationalisation. "We've been very active in creating bilateral cooperation with China, for instance. Several research teams have also worked to establish contacts in India," he says.

Finland is involved in the International Stem Cell Forum. One of the funding partners is a private American foundation, which has invested considerable sums in supporting Finnish research via the Academy. "This is an interesting concept. Is it possible through these kinds of joint programmes to get more international funding into Finnish research? Money is obviously not the only objective, but the ultimate aim is genuine internationalisation." ■

Focus of international activities on Europe and Asia

The Academy has continued to work closely with research funding agencies and research organisations from other countries. Special focus is placed on India, China, Japan and Russia and more recently on the South American countries Brazil and Chile. The Academy works to promote and support the collaboration of Finnish researchers with scientists and research teams from all these countries.

The main focus of the Academy's international activities is Europe. In 2006, the Academy pressed ahead with preparations for the EU 7th Framework Programme (FP7), both at home and in cooperation with the European Parliament and Commission. The Academy is charged with national responsibility for the preparation of nine FP7 actions.

Apart from the Framework Programme, other key areas of activity included the European Research Council ERC, European research infrastructures and the removal of obstacles to researcher mobility.

The Academy's President served in a personal capacity on the European Research Advisory Board, which supports the European Commissioner for Research.

During the Finnish Presidency of the EU, the Academy worked closely with the European Commission, research institutes, ministries and universities to organise experts meetings on research and science policy. Some of the meetings were scheduled events connected with the EU Presidency, others were held at Finland's initiative.

The meetings were Science Meets Policy; Impacts of Endocrine Disrupters; Baltic Sea and European Marine Strategy; European Platform for Biodiversity Research Strategy; Humanities in the ERA; Women and Science; and EuroBioForum. In addition, the ERC's Scientific Council convened in Helsinki. The information briefing held in connection with their meeting saw an attendance of almost 100 researchers.

The Academy-Tekes liaison office in Brussels hosted a series of science policy events, maintained active exchange with EU bodies and worked to establish new contacts with other European R&D stakeholders.

The Academy's Research Councils contributed to EUROCORES programmes of the European Science Foundation ESF by funding Finnish research teams involved in those programmes and by paying the membership fees for a large number of research networking programmes.

The Research Council for Biosciences and Environment was involved in three EUROCORES programmes: Climate Variability and the Carbon Cycle; Science of Protein Production; and Challenges of Biodiversity Science. The Research Council for Culture and Society was involved in four EUROCORES programmes: Origin of Man, Language and Languages; Histories from the North; Consciousness in a Natural and Cultural Context; and European Collaborative Research Projects. It also contributed to compiling a humanities citation index. The Research Council for Natural Sciences and Engineering decided to join the EUROCORES programme Friction and Adhesion in Nanomechanical Systems; it was already involved in two other programmes, viz. Self-organized Nanostructures and Smart Structural Systems Technologies. The Research Council for Health took part in the EuroSCOPE programme together with the Research Council for Biosciences and Environment and in the Pan-European Clinical Trials programme.

Furthermore, the Academy Research Councils had their representatives on the ESF's Standing Committees. This provided an important channel of influence on European research cooperation and the content and start-up of new programmes.

New initiatives through joint calls for applications

In 2006, the Academy held joint calls for applications with funding agencies from India, China and Russia. Based on bilateral agreements, the principle of these joint calls is that once the applications have been reviewed, the funding agencies make a joint decision on the projects to be funded and then each provides the funding for researchers in their respective countries.

The Research Council for Health held a joint call with the Indian Department of Biotechnology in January 2006. As a result of an Indian-Finnish scientific workshop and other discussions, the themes chosen for the call were vaccine development, diagnostic methods and computational biology related to drug development. The Academy spent one million euros to support five projects.

Feedback from Finnish and Indian researchers suggests that the early experiences of collaboration have been extremely good. Researchers involved in the projects have made visits to other participating teams. Talks on the continuation and further expansion of funding cooperation have already been held.

The Research Council for Culture and Society held a joint call for applications with the Chinese Academy of Social Sciences on the subject of intercultural communication.

The Research Council for Culture and Society held another joint call with the Russian Foundation for Humanities. The purpose is to support projects interested in questions of innovation, knowledge and competence as well as their translation into commercial products.

The Research Council for Natural Sciences and Engineering and the Russian Foundation for Basic Research held a joint call for application in the field of optical materials research. On this basis the Academy allocated one million euros to six projects.

The Academy and the German Research Foundation (DFG) signed a memorandum of cooperation to support Finnish-German researcher training. The aim is to promote long-term collaboration in researcher training, to stimulate the internationalisation of researcher training and the mobility of doctoral students and to improve the quality of researcher training at Finnish and German universities.

In its Brazilian cooperation, the Academy looks forward to collaboration in the field of energy research. The Brazilian National Science and Technology Council (CNPq) is interested in cancer research.

Nordic cooperation

The Academy has been closely involved in planning and implementing the work of the Nordic organisation NordForsk. The Academy's Vice President for Research has served as Vice Chair of the NordForsk Board. The members of the Academy's Research Councils and representatives of the Administration Office have taken part in the work of the Joint Committees of Nordic Research Councils (NOS). NOS-N (natural sciences, engineering and environment), NOS-M (medical sciences) and NOS-HS (humanities and social sciences) shall continue to operate within their respective fields of expertise in the new framework for Nordic research cooperation.

Launched at the initiative of NOS-N at the beginning of 2003 and involving all the Nordic countries except Iceland, the Nordic Data Grid project has been going on for the past three years in preparation for the establishment of a Nordic Data Grid Centre. Following an international evaluation in spring 2005 and discussions with relevant Nordic organisations, the decision on the opening of the Nordic Data Grid Centre was made in 2006. In Finland, the Ministry of Education took a decision in principle to commit itself to the Nordic Data Grid Facility early in the year, and Finland's membership contribution was paid from Academy appropriations.

The Nordunet3 programme uses joint Nordic funding to promote expertise and R&D in Internet technology and services in the Nordic countries. The programme is funded by NOS-N member organisations, the Nordic Council of Ministers, NORDUnet A/S and NordForsk. The Research Council for Natural Sciences and Engineering will be contributing an annual maximum of 95,000 euros to the Nordunet3 programme over the next four years. Among the six projects that started up in spring 2006, five involve Finnish researchers. One of the projects is coordinated from Finland.

In 2006, there were three ongoing Nordic Centre of Excellence (NCoE) programmes. Among the four units involved in the NCoE Programme in Global Change, which is funded by the Joint Committee of the Nordic Research Councils for Natural Sciences (NOS-N) and NordForsk, one is coordinated from Finland and two other units involve Finnish research teams. Preparations continued in 2006 for the final evaluation of the programme, which will be carried out in 2008.

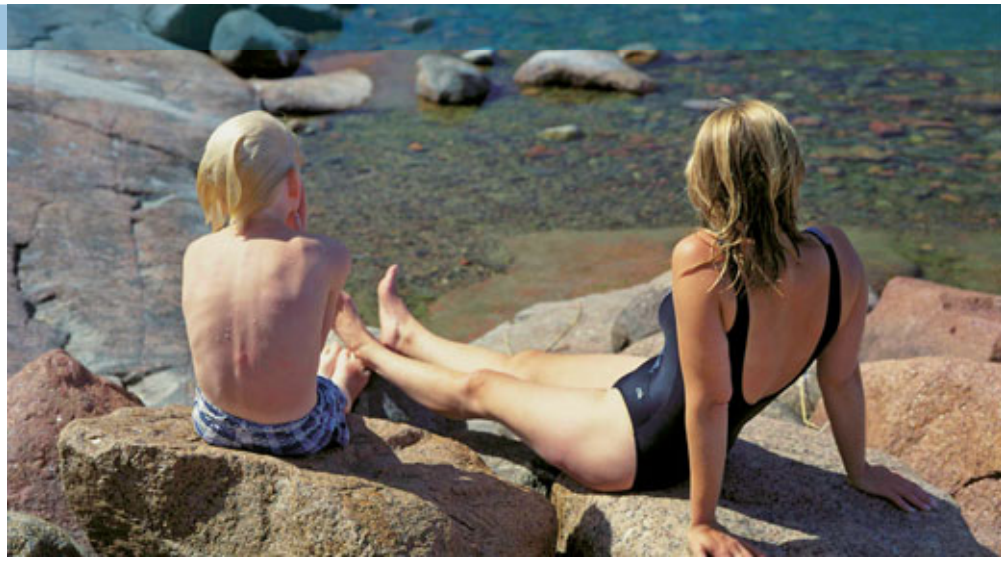
The units involved in the NCoE Programme in Molecular Medicine (2004–2009), which is funded by the Joint Committee of the Nordic Medical Research Councils (NOS-M) and NordForsk, continued to move forward with their work. The programme provides funding for three units, one of which is coordinated from Finland, and two others involve Finnish research teams.

The four research networks chosen to take part in the NCoE Programme in the Humanities and Social Sciences in 2005–2010 started their work. Finnish researchers are involved in all of these centres. The programme is funded by the Joint Committee for Nordic Research Councils for the Humanities and Social Sciences (NOS-HS) and NordForsk.

NordForsk joined forces with Nordic national funding bodies to work on preparations for a new NCoE Programme on Food, Nutrition and Health.

Making good use of infrastructures

Academy representatives have been involved in the work of the Euro-



pean Strategy Forum on Research Infrastructures (ESFRI). ESFRI is in the process of compiling the first ever plan for European research infrastructures.

In autumn 2005, the steering group at the Science and Technology Policy Council charged with the preparation of a strategy for national Strategic Centres for STI and for infrastructures appointed a working group to specify the aims and priorities of the national infrastructure policy.

In October, the Ministry of Education appointed a working group to draft a national research infrastructure policy. The Academy is represented on this working group.

European ERA-NET networks

The Academy takes the view that the networking and partial opening up of national research programmes by means of the ERA-NET funding scheme was a ground-breaking reform in the EU 6th Framework Programme. The Academy is coordinator for two ERA-NET projects and is involved as a partner in 13 others. In addition, the decision was made in 2006 that the Academy shall join a new ERA-NET project: NEURON ERA-NET. (See page 42 for a full list of ERA-NET projects.)

BONUS for the Baltic Sea Science – Network of Funding Agencies, one of the Academy-coordinated ERA-NET projects, continued preparations for a joint research programme among Baltic Sea states that will be conducted in accordance with Article 169 of the EU Treaty. The BONUS-169 Baltic Sea Science Plan and Implementation Strategy provides the outline for the scientific content of the programme. More than 800 researchers and end-users from all nine Baltic Sea states were involved in preparing it.

NORFACE (New Opportunities for Research Funding Co-operation in Europe – A Strategy for Social Sciences), which is also coordinated by the Academy, held an international call for applications under the theme of Re-emergence of Religion as a Social Force in Europe? Ten projects are funded under the umbrella of this programme, which has a budget of 5.1 million euros. Furthermore, NORFACE provided funding for two series of international seminars.

The Academy has been involved in the ERA-AGE network (European Research Area in Ageing Research) since 2004. In 2006, the Academy worked closely with other European funding agencies to prepare for the call for Future Leaders of Ageing Research in Europe, which is to be opened in February 2007.

The three-year ERA-NET network NanoSci-ERA held a joint call for basic research in nanoscience. The Academy contributed with the budget authority included in the FinNano research programme. A total of 8.7 million euros was earmarked to twelve research projects applying for NanoSci-ERA funding. One Finnish research team is involved in these projects.

The Academy participated in the ERA-NET Pathogenomics programme, a joint undertaking of eight countries. This programme awarded funding to twelve research consortia, involving altogether five Finnish research teams.

In the ERA Plant Genomics network, the Academy granted 750,000 euros to support the projects of Finnish researchers. New projects will be added to the list at the beginning of 2007. The international consortia funded through the programme apply the tools of genomics to study plant biology.

In November 2006, WoodWisdom, the forestry and wood sector ERA-NET, opened a call for a pan-European research programme. Fifteen funding organisations from seven countries took part in the call, in which applications are invited separately for basic research, on the one hand, and for applied research and research in the business sector, on the other. The Academy will be supporting the basic research component by a sum of around one million euros.

New initiatives

With the continued growth of competition for funding resources, there has been increasing concern over the prospects of success for high-risk research with breakthrough potential in peer reviews. On the other hand, with the ever intensifying competition among research systems, science is under mounting pressure to transform itself and to show greater diversity. In recent years, several international funding agencies have been looking into ways of sponsoring breakthrough research.

In 2006, the Academy conducted an inquiry into breakthrough research, which included an examination of international funding models, a round of internal discussions at Research Councils and Research Units, and a review of applications for general research grants in 2005 in selected fields of research.

The opinion that emerged from these discussions was that breakthrough research requires closer attention but also conceptual elaboration. The analysis of applications submitted in 2005 and their reviews showed that the Academy does fund high-risk research projects as well, provided that they are exceptionally innovative and of a high scientific quality. Potential breakthrough research was also found among rejected projects that were rated as average or above average. Among the total of 206 projects reviewed, one-tenth were identified as breakthrough research, and half of them were funded. These projects accounted for just over one-fifth of all projects funded in the fields under study.

Research programmes

Research programmes were a major focus of the Academy's activities. In 2006, there were 17 ongoing research programmes (all research programmes are listed on page 39). The Academy invited applications to five research programmes, reviewed those applications and made its funding decisions. Final evaluations were completed on four research programmes.

All Academy research programmes share the same goals of raising the scientific standard of research in the field concerned, developing the field of research or science, and creating new or reinforcing existing scientific traditions and know-how. Furthermore, they are committed to promoting multidisciplinary and interdisciplinary approaches as well as national and international collaboration between researchers, funding agencies and end-users of research results.

Research programmes helped to give greater visibility to researchers both nationally and internationally. A wide range of exploratory workshops, seminars and science breakfasts were arranged by these programmes and on their themes, giving them better exposure in the press.

Work was completed on a study looking at the experiences of the Academy's Finnish partners in funding research programmes. The findings suggest that these funding organisations are generally pleased with how their views and opinions are taken into account during the programme, but they were keen to learn more about how the themes for the programmes were developed and selected. At the end of 2006, the Academy created a new tool on its website that allows research communities and other stakeholder groups to submit programme initiatives for consideration.

The Research Programme on Sustainable Production and Products (KETJU) was launched. In 2007–2010, Academy funding to the 15 research projects selected to the programme will amount to 7.5 million euros. The themes covered range from catalyst research, biorefinery and molecular biological methods to the development of new non-halogenated flame retardants.

The Research Programme on Nanoscience (FinNano, 2006–2010) got underway. The Academy has earmarked nine million euros for this programme, which addresses the complex scientific challenges and the need for innovation in this new field of research. The programme will be working closely with the Tekes FinNano technology programme as well as the Ministry of Education's nanoscience development programme. The Academy's FinNano programme provides funding for ten research consortia and for the Finnish component of one NanoSci ERA-NET project. In addition, four Finnish-Russian nanoscience

projects funded from other sources will be linked to the research programme.

The Substance Use and Addictions Research Programme (2007–2010) is financed jointly by the Academy, the Ministry of Social Affairs and Health, the Canadian Institute of Neurosciences, Mental Health and Addiction, the Russian Foundation for Basic Research and the Russian Foundation for Humanities. Funding worth 5.5 million euros was granted to eight national projects and five international research consortia, two of which involve teams from Finland and Canada, two from Finland and Russia and one from Finland, Canada and Russia.

The Research Programme on Nutrition, Food and Health (ELVIRA, 2006–2010) aims to produce sound and innovative research knowledge on foodstuffs and nutrition. Academy funding to the 15 four-year projects selected to take part in the programme will amount to seven million euros. Tekes and the Ministry of Agriculture and Forestry will also be funding the programme.

The Research Programme on Power and Society in Finland (VALTA, 2007–2010) started. Researchers are clearly intrigued by questions of power: the Academy received 114 letters of intent, 55 of which went through to the second round. In the end, 21 projects received the go-ahead, with Academy funding totalling 6.5 million euros. The themes covered in the programme range from leadership and fear to power elites, gendered organisations and the management of Finnish energy policy.

The Research Programme on Neuroscience which started up at the beginning of 2006 (NEURO, 2006–2009) has 23 projects under its umbrella. Four of these projects are research consortia between Finnish and Chinese partners, and three between Finnish and Canadian partners. Funding comes from the Academy, the Canadian Institute of Neurosciences, Mental Health and Addiction, and the National Natural Science Foundation of China.

In 2006, the Research Programme on Environmental, Societal and Health Effects of Genetically Modified Organisms (ESGEMO, 2004–2007) focused mainly on the aspect of social impact. The programme continued to host discussions open to the general public.

Work was continued in preparation of the Sustainable Energy Research Programme (SusEn). The Academy Board has earmarked nine million euros to the programme out of its 2007 authority. Additional funding will be available from national funding partners, but talks were also held on opportunities for international funding cooperation among others with an Austrian and Nordic funding organisations.

An exploratory workshop in preparation of the Research Programme on the Future of Work and Well-being attracted the participation of more than one hundred researchers. The Academy Board has earmarked eight million euros for the programme. Funding will also be made available by the Ministry of Education and the Finnish Work Environment Fund. The programme has already attracted widespread interest in many different fields and disciplines, and there is every reason to expect that this will become a genuinely multi- and interdisciplinary programme.

The Academy Board extended the authority to pursue negotiations on the Research Programme on Responding to Public Health Challenges. The Board granted authority to launch negotiations on two further programmes, viz. The Citizen and the Diversity of Communication, and Photonics and Modern Imaging Methods. Preparations for these programmes will start in 2007.

In 2006, final evaluations were conducted on four research programmes: Baltic Sea (BIREME), Finnish Companies and the Challenges of Globalisation (LIIKE), Microbes and Man (MICMAN) and Proactive Computing (PROACT) (see page 10).

National Centre of Excellence programmes

The Academy Board appointed 18 units to the national Centre of Excellence (CoE) programme 2008–2013. Eight of these units are newcomers to the programme, ten have been funded in earlier CoE programmes in 2000–2005 and 2002–2007, but have now updated and revised their research plans. A total of 113 units submitted letters of intent and 44 went through to the second round on the basis of reviews and statements by international experts and the Academy's science policy considerations. At the second stage, international experts reviewed the applications and made visits to the units concerned.

The 16 units funded through the second national CoE programme (2002–2007) continued to move forward with their work. Preparations for the final international evaluation of the first two programmes (2000–2005 and 2002–2007) went ahead. The programmes will be evaluated simultaneously in 2008. (Centres of Excellence listed on page 41.)

Increasing the appeal of research careers

The Academy is committed to increasing the appeal of research careers, widening the range of career options available upon completion of the doctorate and promoting the recruitment of women into research. In 2006, the Academy completed a reform of its funding instruments with a view to meeting these requirements.

Postdoctoral researcher's project funding was opened for application for the first time in 2006. The most talented postdoctoral researchers were granted funding to pursue a particularly promising research plan and to set up their own small research teams.

The Academy's two funding schemes for intersectoral collaboration were opened for application in October: funding for researcher mobility in working life (available for the first time) and funding for the doctoral studies of employed persons (revised scheme). In both cases it proved challenging to find suitable applicants from the private business sector.

The Academy's new funding instrument for researcher mobility in working life is designed to facilitate and support the mobility of researchers between academia, the private business sector and public administration and in this way to create more exposure between the latest research knowledge and the challenges of working life. A further objective is to facilitate the mobility of PhDs from one career path to another.

The funding instrument for the further education of employed persons is designed to support the doctoral studies of people working in business and industry, research institutes, and public administration.

Jointly administered by the Academy and Tekes, the Finland Distinguished Professor Programme is aimed at raising the level of scientific and technological know-how in Finland. Under this programme the Academy invited 16 leading researchers in their fields to work in Finland.

Several surveys and reports were published related to the research career. Two of these concerned the postgraduate stage, i.e. the research career prior to the doctorate: *The Development of Doctoral Education* (Ministry of Education) and *PhD Training and the Knowledge-Based Society: An Evaluation of Doctoral Education in Finland* (Finnish Higher Education Evaluation Council). In the summer, the Ministry of Education published the final report of the committee on the development of research career as well as various committee memoranda and reports on the postdoctoral career. The Academy was actively involved in the committee appointed by the Ministry of Education and served in an expert capacity in the monitoring group.

The Academy has taken action in response to the recommendations set out in these reports. It has conducted an evaluation of graduate schools and their scientific standard, with special consideration to internationalisation, the position of women, business contacts and the future demand for PhDs. It was recommended that graduate schools be amalgamated to form larger units. At the beginning of 2006, there were 124 units in the graduate school system.

The Academy has increased the number of its tenured researchers. At year-end 2006, there were 40 posts for Academy Professors and 260 for Academy Research Fellows.

The Academy is involved in the ESF-administered European Young Investigators Award (EURYI), which was founded by the European Union Research Organisations Heads of Research Councils (EUROHORCs). The purpose of the EURYI scheme is to support the scientific independence of talented young researchers, help them set up their own research teams and to encourage internationally high-level research. Worth in excess of one million euros, one of the 2006 awards was granted to Juha Kalevi Pakkala from the University of Helsinki.

The Academy's incentive and recognition awards were presented for the fourth time at the Academy's Science Gala. The Incentive Award was presented to Academy Research Fellow Jyri-Pekka Mikkola from Åbo Akademi University and the Recognition Award to Professor Teivo Teivainen from the University of Helsinki.

Viksu toured upper secondary schools

The Academy's annual science competition for upper secondary students or 'Viksu' is intended to inspire interest among young people in science and a career in research.

The winners of the 2005 competition were awarded in March 2006. The first prize went to Jyri Eskola from Ressu upper secondary school for a competition entry in the field of biology.

A record number of 178 entries were received before the deadline to the ninth Viksu competition in November, with 205 upper secondary students contributing – another record. A special competition under the theme of Today 2015 attracted 27 entries.

The Academy's operating environment and science funding

The Academy operates within the administrative sector of the Ministry of Education. The main science policy challenges identified in the Ministry of Education 2006 outlook are the internationalisation of university education and research as well as the development of researcher training and research careers. The outlook report says that Finland can meet the challenges of globalisation by upgrading its national research system and by expanding its international collaboration in scientific research. The aim must be to have a university system that generates ever more research of a high international standard. The quality of research must be high enough so that top foreign universities, research institutes and private businesses are genuinely interested in collaborating with Finnish universities.

The Ministry takes the view that research in Finland is of a very high standard and as such provides an excellent foundation for further internationalisation. The country's education, research and innovation systems are all of a very high quality, open and transparent and are well equipped and prepared for cooperation. The research intensity is high. Finnish researchers have a strong role and presence in European research.

Finland's R&D investment continued to marginally outpace GDP growth in 2005, when it stood at 3.5 per cent of GDP. In 2006, the figure is expected to fall back slightly to 3.4 per cent.

Finland's R&D investment as a proportion of GDP is the third-highest in the world after Israel and Sweden. Other highly R&D-intensive countries include Japan, Switzerland, Iceland and South Korea. Among the Nordic countries, Denmark ranks among Europe's most R&D intensive countries (Figure 4).

Central government R&D funding in 2006 amounted to almost 1.7 billion euros, up by 83 million euros on the figure for 2005. Research funding increased nominally by 5.2 per cent and in real terms by an estimated 2.7 per cent. Research spending as a proportion of central government expenditure excluding debt servicing costs was 4.5 per cent as in the previous year, and public R&D

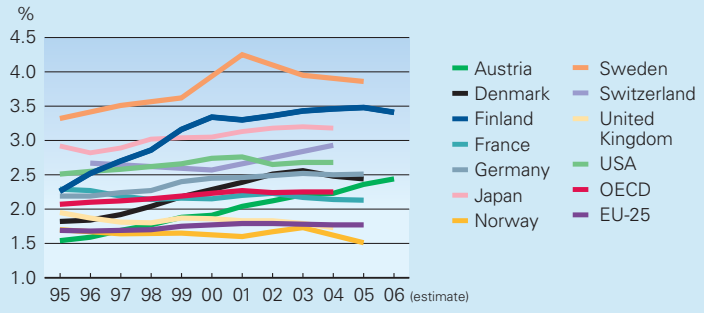
R&D spending in Finland by sector, real change and proportion of GDP in 1999–2005 and estimate for 2006

Year	Private business sector		Public sector		University sector		Total	Real change from previous year	R&D spending as % of GDP[2]
	million €	%	million €	%	million €	%	million €	%	%
1999	2,643.9	68.2	470.1	12.1	764.8	19.7	3,878.8	14.5	3.16
2000	3,135.9	70.9	497.4	11.2	789.3	17.8	4,422.6	11.1	3.34
2001	3,284.0	71.1	500.9	10.8	834.1	18.1	4,619.0	1.4	3.30
2002	3,375.1	69.9	529.7	11.0	925.6	19.2	4,830.3	3.3	3.35
2003	3,527.9	70.5	515.4	10.3	961.7	19.2	5,005.0	4.0	3.45
2004	3,683.5	70.1	530.1	10.1	1,039.8	19.8	5,253.4	4.4	3.46
2005	3,876.9	70.8	554.7	10.1	1,042.1	19.0	5,473.8	3.5	3.48
2006[1]	4,057.7	70.7	565.5	9.9	1,113.1	19.4	5,736.3		3.41

1) Estimate based on questionnaire responses and other calculations.
2) GDP 2004 and 2005 preliminary data from Statistics Finland, GDP Ministry of Finance forecast.

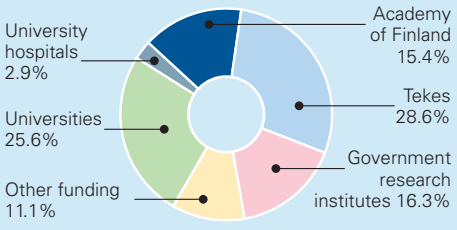
Source: R&D activities 2005, Statistics Finland 2007

Figure 4: R&D investment as a proportion of GDP in selected OECD countries



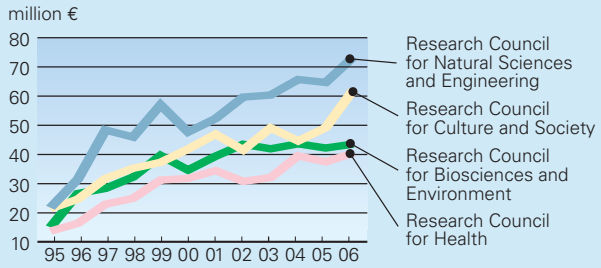
Source: OECD, Main Science and Technology Indicators, 2006
R&D activities 2005, Statistics Finland 2007

Figure 5: Government R&D funding in the state budget 2006



Source: Statistics Finland 2007

Figure 6: Academy of Finland research funding by Research Councils 1995–2006



funding as a proportion of GDP was over 1.05 per cent.

The Academy accounted for 257.4 million euros or 15.4 per cent of total R&D funding; the figures for Tekes were 478.2 million euros and 28.6 per cent, respectively (Figure 5).

Academy research funding

2006 was financially an exceptionally good year for the Academy: funds made available for allocation by the Academy increased in real terms by 12.4 per cent. The extra funds were spent on promoting internationalisation, supporting graduate schools and on general research grants. The number of new research projects started up with Academy funding was higher than in previous years.

In 2006, Academy funding for basic research amounted to 238.7 million euros; in 2005 the figure was 218.7 million euros.

The Academy received a total of 5,567 funding applications worth 1.1 billion euros. The corresponding figures for 2005 were 5,964 applications and 1.2 billion euros.

Competition for funding is intensive: this is because the number of researchers and the standard of research are rising and international interaction is increasing. It is increasingly difficult for the Academy to provide funding even for many researchers who get excellent reviews. The success rate of applications for the Academy's major forms of funding has been on the decline for a number of years now.

Around 20 per cent of all applications are funded. In the 2006 call for research grants, for example, 22 per cent or around one-fifth of applications were given the go-ahead. In value terms, funding was granted to one-seventh (14%) of the amount applied for. In the call to the Centre of Excellence programme for 2008–2013, 80 per cent of the applications (35 out of 44) received the highest possible overall rating. According to the foreign reviewers, 28 applications or almost two-thirds are among the top five per cent globally in their respective fields, but only 18 units will be funded.

The breakdown of funding decisions by site of research has shown only slight variation in 2000–2006. About 80 per cent of Academy funding went to research projects, research programmes and Centres of Excellence in research at universities (Figure 8). The single biggest funding recipient was the University of Helsinki: 62 million euros (page 24).

The Academy's research funding is spread out across several fields of research. Most of the funding was allocated to research applications submitted in disciplines under the Research Council for Natural Sciences and Engineering (Figure 6).

Figure 7: Academy of Finland research funding in 2006

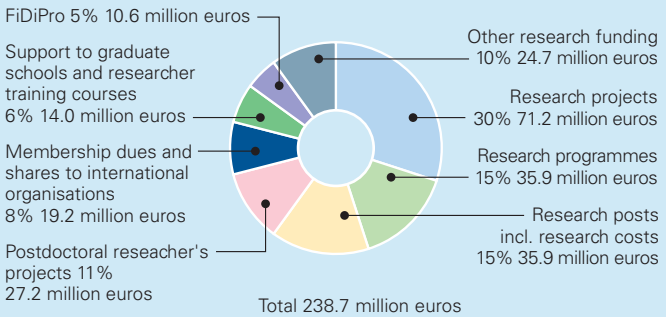
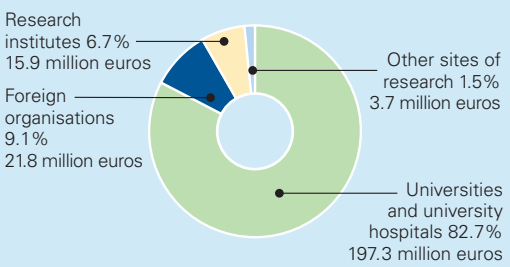


Figure 8: Breakdown of Academy of Finland research funding by site of research in 2006



Funding decisions of the Academy of Finland in 2004–2006 by discipline

Discipline	2006	%	2005	%	2004	%
Natural sciences	**94,068,516**	**39**	**103,032,060**	**47**	**91,136,890**	**44**
Space research and astronomy*	4,048,780		15,956,960		3,161,010	
Biology, environmental sciences	30,870,300		32,553,120		32,863,330	
Physics**	28,208,090		24,145,320		22,464,420	
Chemistry	10,092,540		8,762,350		9,953,800	
Mathematics	5,506,645		5,931,520		6,282,360	
Information processing science	10,241,341		12,262,820		9,722,020	
Geography	1,905,960		961,540		1,410,620	
Geosciences, meteorology	3,194,860		2,458,430		5,279,330	
Engineering	**25,238,690**	**11**	**16,635,620**	**8**	**22,786,910**	**11**
Architecture	638,550		207,610		413,220	
Construction engineering, community planning and municipal engineering	1,399,860		1,896,920		1,347,030	
Electronical engineering	10,732,910		6,206,750		9,547,960	
Energy technology	351,820		31,280		101,590	
Metallurgy and extractive engineering	916,810				394,750	
Mechanical engineering	1,421,450		3,086,830		1,837,820	
Process and materials technology	3,753,930		3,410,500		3,942,270	
Chemical engineering and chemical process technology	1,694,780				2,350,940	
Wood processing technology	737,910				371,250	
Biotechnology and food engineering	2,352,410		1,507,280		2,295,360	
Other engineering	1,238,260		288,450		184,720	
Medicine and health sciences	**45,264,520**	**19**	**42,214,876**	**19**	**43,999,580**	**21**
Medicine and nursing science					1,590	
Biomedicine	22,548,310		20,311,836		26,675,480	
Clinical medicine	9,383,600		13,294,170		7,692,450	
Nutrition science	1,334,420		770,420		557,010	
Public health science	6,661,340		3,569,710		4,142,420	
Dental science	970,080		550,110		816,760	
Sports sciences	361,790		128,000		574,220	
Pharmacy	2,500,170		2,262,670		2,625,400	
Nursing science	85,820		615,700		195,190	
Veterinary medicine	1,418,990		712,260		719,060	
Agriculture and forestry	**7,009,340**	**3**	**5,156,960**	**2**	**2,720,070**	**1**
Agricultural sciences, food sciences	4,237,790		2,339,590		438,850	
Forest sciences	2,771,550		2,817,370		2,281,220	
Social sciences	**39,069,610**	**16**	**31,627,221**	**15**	**28,696,120**	**14**
Economics	2,937,360		2,018,640		1,562,600	
Business economics, economic geography	6,320,010		5,675,880		3,005,690	
Law	3,871,260		1,862,730		3,262,860	
Social sciences	11,432,090		6,975,430		8,299,070	
Psychology	3,510,270		6,228,190		5,655,360	
Education	4,746,040		3,087,771		1,691,830	
Political science and administration	4,914,870		3,178,850		2,351,430	
Communication, library science and information science	1,225,650		2,195,330		2,812,500	
Statistics	112,060		404,400		54,780	
Humanities	**24,964,878**	**11**	**19,836,223**	**9**	**18,574,877**	**9**
Philosophy	2,601,150		3,950,800		2,489,197	
History and archaeology	7,307,510		4,316,550		3,755,370	
Philology and linguistics	6,196,460		5,210,913		3,646,150	
Aesthetic fields research and literature	2,465,960		1,880,620		3,976,230	
Theology	2,239,308		1,602,690		2,844,790	
Cultures research	4,154,490		2,874,650		1,863,140	
Others***	**3,084,980**	**1**	**200,000**	**0**	**50,000**	**0**
Total (€)	**238,700,534**	**100**	**218,702,960**	**100**	**207,964,447**	**100**

* The figures include the European Southern Observatory's (ESO) annual membership dues (€1,683,800 in 2006) and admission fee in 2005 (total €10,529,010).
** The figures include the CERN membership dues (€8,239,500 in 2006).
*** The figures include the Academy's funding share to the EURYI Scheme (€2,550,000 in 2006) and additional funding allocated to universities (€534,980) for pay increases arising from the new UPJ salary system in Academy-funded research projects for which the funding decision has been made before 2006.

Funding decisions of the Academy of Finland in 2004–2006 by site of research

Site of research	2006	%	2005	%	2004	%
Universities	**195,238,354**	**81.8**	**166,634,384**	**76.2**	**173,476,787**	**83.4**
Helsinki School of Economics	3,168,320	1.3	1,118,050	0.5	2,020,890	1.0
University of Helsinki	61,941,460	25.9	61,102,313	27.9	63,698,407	30.6
University of Joensuu	6,724,490	2.8	5,935,260	2.7	5,097,470	2.5
University of Jyväskylä	15,357,215	6.4	16,620,921	7.6	14,143,830	6.8
University of Kuopio	8,453,030	3.5	8,140,730	3.7	8,070,070	3.9
Academy of Fine Arts	180,000	0.1				
University of Lapland	1,420,890	0.6	1,221,010	0.6	989,810	0.5
Lappeenranta University of Technology	3,069,260	1.3	919,930	0.4	1,583,210	0.8
National Defence College	900	0.0	113,380	0.1		
University of Oulu	18,079,800	7.6	10,498,130	4.8	13,441,280	6.5
Sibelius Academy	788,020	0.3	21,000	0.0	719,010	0.3
Swedish School of Economics and Business Administration	118,130	0.0	647,600	0.3	42,400	0.0
University of Art and Design Helsinki	329,070	0.1	277,250	0.1	789,990	0.4
Tampere University of Technology	8,620,530	3.6	4,845,440	2.2	6,161,360	3.0
University of Tampere	15,915,220	6.7	9,135,650	4.2	9,531,450	4.6
Theatre Academy	180,000				150,870	0.1
Helsinki University of Technology	18,761,471	7.9	25,220,330	11.5	20,718,100	10.0
Turku School of Economics	1,864,880	0.8	779,330	0.4	724,280	0.3
University of Turku	22,984,740	9.6	14,214,730	6.5	17,533,830	8.4
University of Vaasa	241,510	0.1	446,460	0.2	278,050	0.1
Åbo Akademi University	7,039,418	2.9	5,376,870	2.5	7,782,480	3.7
University hospitals	**2,083,700**	**0.9**	**2,295,740**	**1.0**	**1,066,600**	**0.5**
Research institutes	**15,944,370**	**6.7**	**16,847,596**	**7.7**	**11,729,200**	**5.6**
Foreign organisations	**21,791,090**	**9.1**	**28,503,920**	**13.0**	**16,530,090**	**7.9**
Scientific societies	**1,440,420**	**0.6**	**1,241,430**	**0.6**	**1,371,080**	**0.7**
Polytechnics	**19,080**	**0.0**	**88,220**	**0.0**	**77,740**	**0.0**
Business companies, total	**373,250**	**0.2**	**248,530**	**0.1**	**308,310**	**0.1**
Other site of research	**1,799,830**	**0.8**	**2,814,810**	**1.3**	**3,363,280**	**1.6**
Individual researchers	**10,440**	**0.0**	**28,330**	**0.0**	**41,360**	**0.0**
Total (€)	**238,700,534**	**100.0**	**218,702,960**	**100.0**	**207,964,447**	**100.0**

Success rate of applications submitted and of applied funding: general research grants 2002–2006 (%)

Research Council	2002			2003			2004			2005			2006		
	Of applications		Of funding applied	Of applications		Of funding applied	Of applications		Of funding applied	Of applications		Of funding applied	Of applications		Of funding applied
	no.	%	%	no.	%	%	no.	%	%	no.	%	%	no.	%	%
Biosciences and Environment	40	21	17	40	19	17	37	16	14	29	12	10	40	15	14
Culture and Society	46	22	12	60	27	14	46	17	9	47	17	9	64	22	13
Natural Sciences and Engineering	104	30	14	116	27	12	88	20	12	82	18	11	119	25	15
Health	52	37	15	64	37	15	48	27	15	38	22	11	46	23	14
Total	242	28	15	280	27	14	219	19	12	196	17	10	269	22	14

Research Council for Biosciences and Environment:
Impact starts with funding decisions

The Research Council for Biosciences and Environment continued its efforts to evoke the highest possible standard of research in the disciplines under its purview, as well as to maintain their diversity, international competitiveness and capacity for renewal.

The Council provided general research funding to 40 projects. It supported research careers by providing funding to 31 postdoctoral researchers, twelve Academy Research Fellows and ten Senior Scientists. There are now 14 graduate schools and nine Academy Professors in the Research Council's disciplines. The Council provided funding for twelve newly graduated PhDs who moved to work abroad to gain international experience in high-level research environments. It offered support for the doctoral studies of eight employed persons and for one researcher's mobility in working life.

The Council awarded funding to support projects in remote sensing and geoinformatics as well as Finnish contributions to two ERA-NET projects, Pathogenomics and Plant Genomics. Efforts were continued to strengthen internationalisation in other disciplines, too. The Council was closely involved in the Academy's bilateral cooperation, for example in the call for applications to the Finnish-Japanese Core programme in the field of biosciences and medicine.

The Council contributed widely to the Academy's surveys on the impact of research (see page 9), focusing mainly on the impact of the Council's earlier funding decisions. The primary criteria in the Council's funding decisions are the high quality of research and its scientific impact. To ensure that funding is allocated to scientifically rigorous projects, the Council relies not only on its own expertise but also independent reviews of project proposals.

The main areas of focus in the Council's impact assessments were on the significance of its funding in food research, the impact of programme funding as well as the impact of international programme cooperation on researcher mobility. The Council published a separate report on its findings.

According to those findings, biosciences and environmental research projects have a broad range of scientific and social impacts. Basic research in these fields promotes not only the advancement of science, but also important social objectives. In environmental research, social impact is most typically seen in the fields of politics and administration. This is because environmental issues have gained strong prominence on the agenda of both national and international politics, thus creating genuine demand for sound research knowledge. This knowledge has also informed the Kyoto Protocol and measures aimed at improving the state of the Baltic Sea.

Monitoring the impact of research is necessarily a long-term effort, as it often takes a long time for new research knowledge to filter through and make an impact on individual citizens, legislation or society in general. The impact of environmental research, however, is clearly seen in environmental protection, for instance. It emerged clearly from the cases considered in the Council's impact studies that the achievement of impact ties in closely with administrative and political processes and with economic interests. Impact will be more readily achieved if there is a social demand for the research results.

New strategic centres in the Council's disciplines

The foresight project FinnSight 2015 (page 8) made it plainly clear that research in the fields hosted by the Council will continue to have great significance in the future. Among the themes singled out as most important to the future of Finland, environment and energy as well as bio-expertise and society are directly related to the Council's expertise.

Research funded by the Council will have a key role to play as work continues to set up Strategic Centres for STI in the forest sector, food research and in the environment sector.

The evaluation report *Food Sciences and Related Research in Finland 2000–2004*, published early in 2006, was put to good use in Sitra's strategy work to create a food cluster with a view to strengthening research on healthy foods and the national food sector and food production. Collaboration with Sitra, the Finnish Innovation Fund, marks an important new development in discipline assessments.

Environment issues at EU meetings

Working closely with the European Commission and several national partners, the Research Council for Biosciences and Environment hosted four high-level international meetings during Finland's EU Presidency (page 15). Some of the meetings were scheduled events connected with the EU Presidency, others were held at Finland's initiative. All meetings were concerned in one way or another with the impact of research, particularly as an environmental policy tool.

The Science Meets Policy meeting looked into ways of how to promote the impact of environmental research in the implementation of environmental policy and related decision-making. A further objective was to increase dialogue between environmental research and policy within the EU. In future meetings the aim will be to try and involve NGOs and the private business sector more closely in these discussions.

The 10-year follow-up meeting Impacts of Endocrine Disrupters focused on the themes of chemical exposure and risk assessment. It discussed the results of the EU project on endocrine disrupters and ex-

plored the future directions of research in this field. The meeting was jointly hosted with the Research Unit for Health.

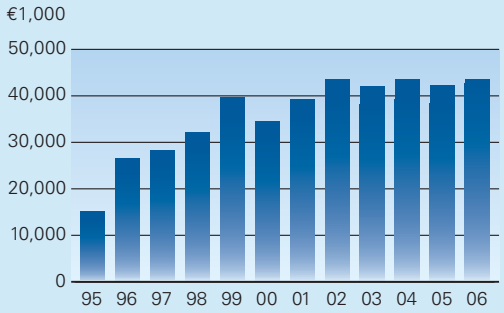
The biodiversity meeting discussed ways in which research can help Europe to achieve the Commission's biodiversity targets for 2010. One of the key points raised was the importance of involving young people and the education system more closely in the debate. A research network in this field was created during Finland's first EU Presidency in 1999.

The multidisciplinary Baltic Sea Conference attracted more than 300 participants to discuss the challenges facing the Baltic Sea and to address the problems from various angles, including research, protection, environmental awareness, need for international collaboration, the EU marine environment strategy and its implementation in the Baltic Sea area. The main organiser of the meeting was the Finnish-coordinated BONUS network of funding agencies within the Baltic Sea countries. The conference communiqué states that the state and future of the Baltic Sea are important not only to the countries around the Baltic Sea Rim, but to the whole of Europe.

Fields of research hosted by the Research Council for Biosciences and Environment

- biochemistry
- microbiology
- genetics
- ecology, biosystematics and biophysiology
- forest sciences
- agricultural sciences
- food sciences
- research into substances hazardous to the environment
- research relating to the state of the environment and to environmental protection
- geography and regional studies
- research relating to environmental policy, environmental economy and environmental law
- biotechnology, molecular biology, cell biology, biophysics, bioinformatics and economic and technological research related to the above fields

Figure 10: Funding decisions of the Research Council for Biosciences and Environment in 1995–2006



Research Council for Culture and Society:
Active dialogue with the scientific community

The Research Council for Culture and Society carried out an impact analysis in its fields of research. The report attracted much interest and inspired lively discussion that is still continuing. The concept of impact received extensive discussion. Rather than considered simply as a source of innovations and applications, science was recognized as having a broad role in reforming society.

New research in culture and social studies impacts society in many different ways: it lays the foundation for general education, reforms that foundation, and provides new insights for understanding the world. The chains of impact are long and complex. The new knowledge gained in research is disseminated via the school system, teacher training, textbooks, newspapers and literature.

Researched knowledge can also impact decision-making in society, legislation as well as practical solutions, as is demonstrated by the Research Council's impact analyses. Psychological research, for instance, has influenced political decisions on the development of the school system in Finland. In many other fields, including business administration, design and arts research, there is often close collaboration between researchers and business companies, which provides a direct route for the application of research knowledge into practice.

The Council assessed the impact of its funding instruments by conducting a review of its research programmes and targeted funding (see page 9). This kind of funding has certainly given greater exposure to many research themes; results from this research have helped to paint a clearer

picture of many subjects on which the general public have only a patchy understanding or that have been neglected altogether. Research funding has helped to create multidisciplinary research teams in these fields and in this way to generate research knowledge for use in new research projects or in practical applications.

Research is expected to meet the needs of society. However, this is not just a one-way street. The needs of society do not exist in a given state, but they can be created and interpreted by means of researchers. In their dialogue and debates on the premises and objectives of scientific research, researchers and other social agents can work to shape these with a view to making research knowledge more applicable.

Number of applications on the up

The number of applications received in the disciplines hosted by the Council increased in 2006. The reason lies in the growing number of researchers entering these fields. In some funding schemes the approval rate is very low indeed, which means that even some very competent applications remain unfunded. Competition is particularly intense for positions of Academy Research Fellow.

In 2006, the Research Council for Culture and Society made funding decisions worth 62 million euros. Funding was allocated among other things to internationalisation of rural studies.

The Council's disciplines comprise a wide spectrum of research subjects in the humanities and social sciences. There is also very strong interdisciplinary and multidisciplinary research in these disciplines. The same subjects can be addressed in several different disciplines using different methods and perspectives; examples include behaviour, language, the past, the operation of community and society. and human experience. Furthermore, the study of language use and discourses is a widely shared method in different fields of research.

The fields concerned involve both qualitative research and studies based on numerical analysis. Key characteristics include the use of multiple different perspectives as well as several parallel paradigms. These are distinctively contextual disciplines, tied up with time and place.

Most of the research in the fields hosted by the Research Council is done at science universities. However, the amount of research at arts universities has increased in recent years. Even though there are some research institutes in the humanities and social sciences, research in these fields is primarily funded by the Academy and a few foundations.

Archives and libraries part of the infrastructure

Research infrastructures received prominent attention in the Council's work (page 16). In these fields of research, infrastructures refer among other things to research data, archives and libraries. A major area of development here is the digitisation of these materials to make them available for online use, which is a very labour-intensive project. Images, texts and other material can only be converted into digital format manually, and once issues of copyright have been settled.

It is important that special attention is given to the search characteristics of these datasets: in cultural and social research these materials are used not only by researchers, but many of them are an integral part of information society's general information services.

The Council hosted two international conferences as part of the Finnish EU Presidency. One was concerned with the position of women in research, the other with the future research needs of the humanities.

The Council has been closely involved in the collaboration of Nordic funding bodies for the humanities (NOS-HS) as well as in Nordic publishing cooperation (NOP). One of the areas attracting much current interest was the transition to electronic publishing.

Research programme on changes in working life

The Research Council commenced work in preparation of a research programme on the challenges of work and well-being. Major programme themes will include changes in the world of work, questions related to the division of labour and income distribution, and associations between work and well-being at the level of both individuals and society.

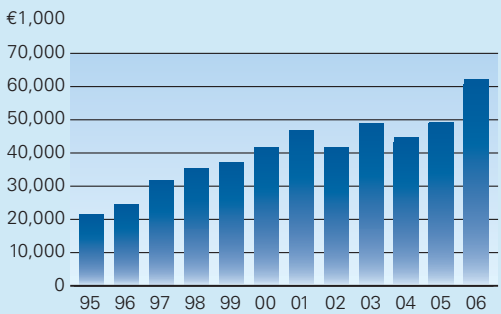
The Council launched preparations for the forthcoming research programme The Citizen and the Diversity of Communication. The Research Programme on Power and Society in Finland got underway, and the projects selected for funding were announced in late autumn.

An evaluation was undertaken on the Research Programme on Finnish Companies and the Challenges of Globalisation. Special attention was given to project cohesion and synergy, project cooperation, collaboration with funding agencies and the integration of different objectives.

Fields of research hosted by the Research Council for Culture and Society

- philosophy
- theology
- history and archaeology
- cultures research
- aesthetic fields research
- philology and linguistics
- law
- psychology
- logopedics
- education
- social sciences
- economics
- political science
- mass communication and library science

Figure 11: Funding decisions of the Research Council for Culture and Society in 1995–2006



Research Council for Natural Sciences and Engineering:
A year of discipline and impact assessments

A major focus for the Research Council for Natural Sciences and Engineering in 2006 was on discipline assessments and impact analyses. In reviewing the applications received for general research grants, the Council's priority was to identify new research innovations and to finance larger units by increasing research grant sizes and supporting network projects.

The Research Council takes the view that the availability and adequacy of open research grants are crucial to the development of new innovations. The number of applications for general research grants has increased 1.7-fold since 2000, and at the same time the approval rate has come down. In 2006, this declining trend was halted as the Council had substantially more funding resources at its disposal. Project funding by the Council amounted to 21.4 million euros, 15.4 per cent of the sum of applications received.

The average size of funding for new projects was purposely increased from the previous year; the figure now stood at 183,000 euros. The Council funded one-quarter of the 471 applications received, i.e. 118 projects or consortium projects.

The natural sciences and engineering fields have seen a marked increase in recent years in multidisciplinary projects and researcher networking. The Council received 50 consortium applications, 15 of which were funded. These 15 consortia involved 38 research teams, and each consortium had 2–4 participating teams. On average, the consortia were granted 415,000 euros, while the average for participating projects was 240,000 euros. The Council decided to sponsor the International Polar Year 2007–2008 by awarding a total of around 1.3 million euros to two consortia.

Evaluations

The Council has committed itself to conducting an evaluation of engineering research. This will be done in three stages: energy technology in 2006, computer science in 2007 and mechanical engineering and manufacturing technology, and automation technology in 2008.

The evaluation of energy research in Finland in 1999–2005 was published in November 2006. The panel of international experts con-

centrated on issues of scientific quality, resources, researcher training, national and international cooperation and the application of results. In the panel's assessment, energy engineering in Finland is heavily oriented to applied research, and there is only limited basic research. One indication of this is provided by the statistic that Tekes accounted for 19 per cent of the research funding of the 23 evaluated units, while the Academy's contribution was no more than three per cent. The research units are scattered across the country and several different teams are doing the same type of work. Indeed, the panel recommends that a unified national research strategy be developed.

Commissioned by the Ministry of Education, an evaluation was conducted of the scientific standards and administration of Finnish Antarctic research in 1998–2005. The evaluation concerned eleven research units, the Coordination Committee for Antarctic research and the Antarctic secretariat that is responsible for logistics. The panel concluded that part of the research in this field has been successful, but in terms of its output it remains below international standards. In addition, it noted that Finnish Antarctic research is weakly integrated with the international research community.

An evaluation was also conducted on the Research Programme on Proactive Computing (PROACT), which ended in 2005. One of the purposes of this programme was to provide an experimental platform for international programme cooperation, with funding for the programme coming not only from the Academy but also from Tekes and the French Ministry of Research and New Technologies. The Academy accounted for 5.7 million euros of the total programme budget of eight million euros. The research programme involved 14 projects: three joint Finnish-French consortia, eight Finnish consortia and three individual Finnish projects.

Published at the beginning of 2007, the PROACT evaluation report concludes that the projects have produced high-quality outcomes and that they have been highly successful in terms of international networking. The results of the programme will pave the way to the development of various new IT applications that will help to make people's life easier, provided that continued funding is made available to the multidisciplinary projects. The call for applications jointly held by the Finnish and French partners is described as having been an exemplary success.

Research funding yields commercial applications

An evaluation of Academy-funded research in the natural sciences and engineering fields was published in April (see page 9). With respect to scientific impacts, the material for the evaluation consisted primarily of the research reports on the funding decisions made by the Research Council for Natural Sciences and Engineering during 1995–2000 regarding the calls for general research grants. A questionnaire study was carried out to explore the practical application of research results and industrial impacts: this comprised all research projects that in 1997 and 1998 had received general research grants in the fields of engineering and information processing sciences as well as the projects involved in two research programmes, viz. Electronic Materials and Microsystems (1999–2002), and Future Mechanical Engineering, (2000–2003). Furthermore, a study was conducted on the placement of Academy Research Fellows.

On average, one million euros of Academy funding (the average project size was 137,000 euros) produced 31 internationally peer-re-

viewed journal articles, four doctoral degrees, 1.9 Licentiate degrees and 4.8 Master's degrees. Project collaboration with partners working in other disciplines contributed favourably to publishing activity. Compared with the average scientific outcomes of Finnish universities, Academy-funded projects were significantly more productive in terms of publication numbers and degrees awarded.

Two-thirds or 64 per cent of Academy Research Fellows appointed in 1990–1997 had received a professorship within 1–10 years of their term as Academy Research Fellow; 35 per cent of them were appointed to the professorship mid-term. The respondents said the research fellowship had been extremely important to their gaining a professorship.

Mobility among the researchers working in the projects reviewed has been fairly low. Within 1.5–5 years of the completion of their projects, more than 60 per cent of researchers with Academy funding continued to work at a university or research institute, and two out of three in this group were still in the same research team. About one-third of Academy-funded researchers had moved to the private business sector.

According to the research reports review, eight per cent of all projects had submitted patent applications. Over one-half or 52 per cent of the Academy-funded projects reported industrial or commercial applications within 1.5–5 years of the end of the funding period. The most important channels of technology transfer into industry were personal contacts and research collaboration. Industry cooperation was reported by 37 per cent of the projects.

There is particularly good cooperation in the natural sciences and engineering fields with business and industry. The Council worked closely with the private business sector to prepare new research programmes and a discipline assessment of energy engineering.

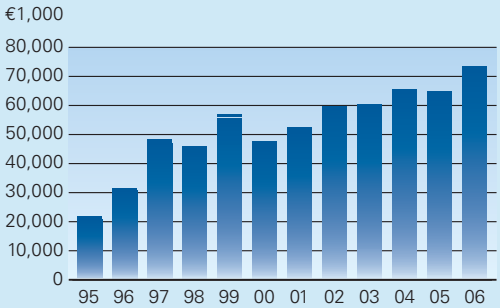
The Council directed around 445,000 euros to promoting mobility between industry and academia. It received 13 applications for funding under the researcher mobility in working life scheme, or roughly half of all applications submitted to the Academy. In most applications received by the Council, the sending organisation was a university or research institute, the recipient organisation a business company. In two projects the applicant was employed in a business enterprise and was seeking for funding to work for 12 months at a university. All the applications were considered very competent, and the Council decided to fund eight of them.

A total of 390,000 euros was awarded to support the doctoral studies of people working outside universities. More than half of the 23 applications received by the Council came from people working in the private business sector.

Fields of research hosted by the Research Council for Natural Sciences and Engineering

- geosciences
- space research and astronomy
- mathematics
- information processing sciences
- telecommunications and automation technology
- electronics and electrical engineering
- medical engineering
- physics and technical physics
- chemistry and chemical engineering
- materials and process technology
- mechanical engineering and manufacturing technology
- architecture and construction and municipal engineering
- statistics
- biotechnology, biophysics and bioinformatics relating to the above fields of research

Figure 12: Funding decisions of the Research Council for Natural Sciences and Engineering in 1995–2006



Research Council for Health:
Impact of funding can be improved

The main focus of the assessments conducted by the Research Council for Health of Academy-funded research was on the impact of different types of strategic funding instruments: research programme funding, special support awarded to small disciplines, and funding for the further international training of researchers.

In the field of health research the long-term social impacts of research may be reflected in changes in health policy, health care and health behaviours and in this way in public health and well-being. However, it is very often difficult to distinguish between the impacts of research and the effects of other, similar developments in society.

The impact assessment published by the Research Council highlighted some new aspects of the Academy's funding instruments. It showed that support for the international further training of researchers produces not only excellent scientists, but also experts who can contribute in many different ways to society. The Finnish health care system benefits from new treatment and diagnostic practices brought back from abroad, which may help to improve not only the cost efficiency of health care but also public health and well-being. However, it seems that the number of young researchers in the health field interested in postdoctoral training abroad has declined in recent years. According to the impact assessment, one of the reasons for this lies in the difficulties they face when returning home. Even a sound strategic funding scheme is therefore at risk of losing much of its significance, if the circumstances are such that the individual researcher is reluctant to apply.

The Council takes the view that the impact of funding can be improved. In planning strategic measures it is important that the objectives are clearly defined, that those objectives are realistic in view of the resources available, that the attainment of objectives can be measured and monitored, etc. The needs of impact assessment should be taken into account from the earliest stages of

programme planning, rather than after the research programme has been completed. It is also important that the various stakeholders are committed to the objectives set out, since all actions involving strategic objectives require a long-term commitment. Good examples are provided by discipline assessments as well as any follow-up measures related to those assessments. The impact assessment conducted by the Council provided invaluable information for future planning purposes.

Clinical research career receives increasing attention

The number of clinical researchers among the Research Council's funding applicants has clearly decreased. In a move to promote the clinical research career, the Council opened a call that allows for pursuing research on a part-time basis alongside clinical work. The Council awarded funding both to young PhDs in training for clinical specialisation and to senior clinical researchers who are more advanced in their work.

Funding applications were received from 47 researchers; 15 of these applications were for part-time research positions in postdoctoral-level projects and 32 for Academy Research Fellow projects. The Council awarded a total of 1.54 million euros to 17 applicants.

Active role in developing the review and evaluation processes

The Research Council is committed to the long-term development of its evaluation functions. It has worked very closely in this area both with other Academy Research Councils and with international funding organisations. Within the Academy, collaboration with the Research Council for Biosciences and Environment has been excellent: the evaluations produced in joint panels are particularly useful to projects working on the interface of different disciplines. At the same time, collaboration helps to avoid overlap in operations.

The cooperation that the Council has had within the Academy and with international funding organisations in project evaluation confirmed the view that the evaluation is indeed a dynamic process that requires ongoing development. Based on the positive experiences, the Council will deepen this cooperation with different partners and exchange best practices of peer review with international funding bodies.

This international cooperation in evaluation is most advanced with the Scientific Council for Medicine under the Swedish Research Council, the Academy's sister organisation in Sweden. In 2004, the Academy's Council for Health put together a panel of leading Finnish researchers to evaluate applications in the field of medicine submitted to the Swedish Research Council's programme on Strong Research Environments. The collaboration was continued in the evaluation of the Council's postdoctoral researcher's projects in Stockholm in 2006. The panels of Swedish experts jointly appointed by both Research Councils evaluated the applications according to the Academy's guidelines, otherwise the panels worked in accordance with the Swedish model. Both parties have been extremely pleased with their cooperation and look forward to continuing it.

As part of the Academy's efforts to develop its evaluation function (page 9), the Council has been particularly active in seeking new models for the panel review process. In 2006, the Council commissioned the review of applications for general research grants outside of Finland. The British Medical Research Council provided

its lists of referees, and the Council proceeded to put together its review panels on the basis of those names. Composed of UK-based researchers, the panels convened at the Finnish Institute in London.

Another aim of this project was to see how discussions on the projects reviewed and the actual assessments would be affected by having a panel with a more homogeneous research background or tradition of doing research. The results certainly encourage further efforts to develop the project review process. The panels that were composed of researchers based in the UK seemed to place stronger and more concerted emphasis on certain factors impacting the quality of research plans, such as their level of detail or the way in which the research hypotheses were formulated.

Discipline assessment launched

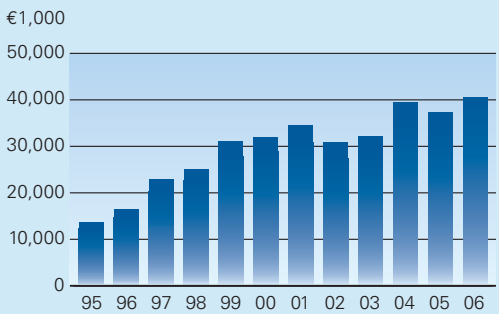
The Council began preparations for a discipline assessment of dental science. A researcher meeting was convened to discuss the need for such an assessment and what kind of information it was expected to produce. As is the case in the field of medicine in general, the interest in clinical research among dental scientists has been on the decline. Researchers in the field have raised concerns as to whether there are sufficient numbers of dentists and dental researchers in the country. The Council's statistics indicate that the number of applications in dental science has dropped over the past less than ten years, even though approval rates have been high. The discipline assessment of dental science will be conducted during 2007, and it will aim to identify weaknesses, strengths and potential areas for development.

The Research Council for Health joined forces with the Research Council for Biosciences and Environment to organise the international EuroBioForum conference. It also hosted an EU meeting for researchers and opinion leaders on endocrine disrupters.

Fields of research hosted by the Research Council for Health

- biomedicine
- veterinary medicine
- pharmacy
- dental science
- nursing science
- public health science
- clinical medicine
- sport sciences
- nutrition
- occupational and environmental medicine
- biochemistry, genetics, microbiology, biotechnology, molecular biology, cell biology, biophysics and bioinformatics relating to the above fields of research

Figure 13: Funding decisions of the Research Council for Health in 1995–2006



Academy of Finland as a workplace

The Academy of Finland offers its staff the opportunity to work on promoting high-level research and international research collaboration. In line with its strategy, the Academy is committed to maintaining and improving the skills, well-being and motivation of its staff and to creating an innovative environment.

At year-end 2006, the Academy's Administration Office had a staff of 166, slightly down on the figure for 2005. The total number of FTEs was 165.

The average age of personnel increased slightly to 44.8 years. In order to achieve a more balanced personnel structure, the decision was made in staff recruitment to take account of the applicants' gender. At year-end 2006, women accounted for 71 per cent and men for 29 per cent of personnel. The proportion with an academic degree was 66 per cent, of whom 24 per cent had a postgraduate degree.

Continued efforts to develop skills and competencies

The Academy gives its employees every opportunity to improve their skills and to grow and develop in their jobs. The Academy believes in the importance of a competent staff and works systematically to support the development of the skills and competencies of all its staff groups. These efforts extend across all career stages, from induction training through to retirement. The aim of human resources management at the Academy is a skilled and competent staff who are motivated, healthy and satisfied in their jobs.

The Academy has undertaken several development projects aimed at raising levels of job satisfaction and improving occupational mastery, increasing the opportunities of staff members to define their job tasks, and to achieving even higher standards of supervision. One of the development programmes in 2006 was in the area of internal staff communication. Steps were also taken to reform the evaluation of leadership and supervision, and guidelines for the prevention of inappropriate treatment and harassment were revised.

Productivity programme brings new challenges

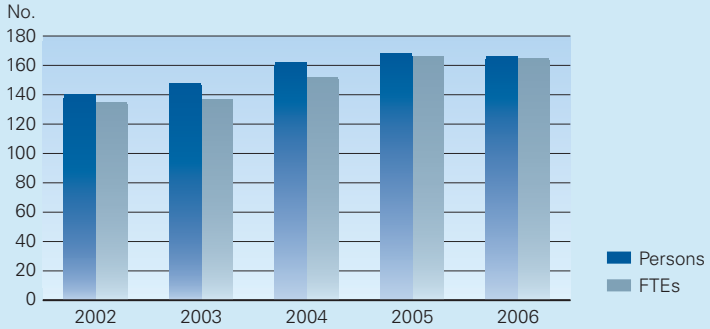
In a situation where the number of funding applications received by the Academy is continuing to rise, the central government productivity programme presents a significant challenge to the Academy's operation and puts its staff under considerable pressure. The first redundancies were announced in 2006. If current decisions are allowed to stand, the Academy will have to lay off more than ten per cent of its staff over the next five years.

To make sure that these operational changes go as smoothly as possible, the Administration Office has in place a human resources policy to support and develop skills and competencies in all staff groups. Programmes for skills development and the promotion of well-being in the workplace cover all the staff working at the Administration Office, their jobs and work environment as well as the workplace community and organisation as a whole.

Positive feedback

Services offered to staff at the Administration Office include everything from staff training to a pleasant and safe working environment and facilities. Staff are particularly pleased with the support they receive for skills development, with ergonomics in the workplace, the workplace restaurant, the excellent gym and the supervised gym sessions.

Figure 14: Staff and FTEs in 2002–2006



Members of Academy Board and Research Councils in 2006

Chair
Raimo Väyrynen,
President of the Academy
of Finland

Vice Chair
Markku Karlsson,
Vice Senior President
UPM Kymmene Corporation

Tiina Mattila-Sandholm,
Senior Vice President
Research Council for Biosciences
and Environment
Valio R&D

Arto Mustajoki, Professor
Research Council for Culture
and Society
University of Helsinki

Riitta Keiski, Professor
Research Council for Natural
Sciences and Engineering
University of Oulu

Kalervo Väänänen, Professor
Research Council for Health
University of Turku

Pirkko Nuolijärvi, Director
Research Institute for the
Languages in Finland

Research Council for Biosciences and Environment

Chair
Tiina Mattila-Sandholm,
Senior Vice President
Industrial Microbiology
Valio R&D

Juha Kämäri, Professor
Environmental Change Research
Finnish Environment Institute

Jyrki Luukkanen, Docent
Climate, Biodiversity and
Development Studies
Turku School of Economics

Markku Löytönen, Professor
Cultural Geography
University of Helsinki

Raili Myllylä, Professor
Biochemistry
University of Oulu

Pasi Puttonen, Research Director
Silvaculture
Finnish Forest Research Institute

Eevi Rintamäki, Professor
Plant Biology
University of Turku

Liselotte Sundström, Professor
Evolution Biology, Ecology
University of Helsinki

Leena Vestala,
Agricultural Counsellor
Gene- and Biotechnology
Ministry of Agriculture and
Forestry

Matti Vornanen, Professor
Animal Physiology
University of Joensuu

Karl Åkerman, Professor
Cell Biology
University of Kuopio

Research Council for Culture and Society

Chair
Arto Mustajoki, Professor
Russian Language and Literature
University of Helsinki

Matti Heikkilä, Professor
Deputy Director General
Social Policy
National Centre for Welfare
and Health, Stakes

Eila Helander, Professor
Church and Social Studies
University of Helsinki

Päivi Hovi-Wasastjerna,
Research Director, Docent
Visual Communication
University of Art and Design
Helsinki

Anne Kovalainen, Professor
Economic Sociology, Business
Know-how
Turku School of Economics

Urpo Nikanne, Professor
Finnish Language and Literature
Åbo Akademi University

Anna Raija Nummenmaa,
Professor
Education
University of Tampere

Kyösti Pekonen, Professor
Political Science
University of Helsinki

Raija-Leena Punamäki, Professor
Psychology
University of Tampere

Juha Sihvola, Professor
History, History of Philosophy
University of Helsinki

Marja Tuominen, Professor
Cultural History
University of Lapland

Research Council for Natural Sciences and Engineering

Chair
Riitta Keiski, Professor
Chemical Process Engineering
University of Oulu

Iiro Hartimo, Professor
Electronics
Helsinki University of
Technology

Hannu Hänninen, Professor
Mechanical Engineering
Helsinki University of
Technology

Timo Jääskeläinen, Professor
Physics
University of Joensuu

Mikko Kara, Professor
Energy Technology
VTT Technical Research
Centre of Finland

Kirsti Loukola-Ruskeeniemi,
Professor
Geology, Geochemistry
Helsinki University of
Technology

Pertti Mattila, Professor
Mathematics
University of Helsinki

Pirkko Oittinen, Professor
Media Technology
Helsinki University of
Technology

Kari Rissanen, Professor
Organic Chemistry
University of Jyväskylä

Ulla Ruotsalainen, Professor
Medical Engineering
Tampere University of
Technology

Kaisa Sere, Professor
Computer Science
Åbo Akademi University

Research Council for Health

Chair
Kalervo Väänänen, Professor
Biomedicine
University of Turku

Anssi Auvinen, Professor
Epidemiology
University of Tampere

Marja-Liisa Hänninen, Professor
Food and Environmental
Hygiene
University of Helsinki

Jorma Keski-Oja, Professor
Cancer Biology
University of Helsinki

Anna-Elina Lehesjoki, Professor
Medical Genetics
University of Helsinki

Helena Leino-Kilpi, Professor
Nursing Science
University of Turku

Pirjo Pietinen, Research Professor
Nutrional Epidemiology
National Public Health Institute

Tuula Salo, Professor
Oral Pathology
University of Oulu

Hilkka Soininen, Professor
Clinical Sciences
University of Kuopio

Arto Urtti, Professor
Biopharmacy
University of Kuopio

Timo Vesikari, Professor
Virology
University of Tampere

Academy of Finland Administration Office: Management, Senior Advisers to Management and Unit Directors in 2006

Management
Raimo Väyrynen, President
Anneli Pauli, Vice President, Research
Juha Sarkio, Vice President, Administration

Senior Advisers to Management
Anne Heinänen, Senior Science Counsel, Senior Adviser to Vice President, Research
Maunu Häyrynen, Senior Adviser
Laine Jarmo, Senior Science Counsel, Senior Adviser to President

Biosciences and Environment Research Unit
Arja Kallio, Director, until 31 May 2006
Johanna Ikävalko, Director, as of 1 June 2006

Culture and Society Research Unit
Liisa Savunen, Director, until 30 April 2006
Pirjo Hiidenmaa, Director, as of 1 June 2006

Health Research Unit
Riitta Mustonen, Director

Natural Sciences and Engineering Research Unit
Susan Linko, Director

Administration Unit
Maarit Saarela, Director

Communications Unit
Maj-Lis Tanner, Communications Director

Finance Unit
Pirkko Virtanen, Director

Information Management Unit
Seppo Raejärvi, Director

International Relations Unit
Raija Hattula, Director

Programme Unit
as of 1 June 2006
Ritva Dammert, Director

Services Unit
Seppo Hongisto, Development Manager

Honorary title of Academician

The highest recognition to scientists and scholars

Based on nominations by the Academy of Finland, the President of the Republic may grant the title of Academician to highly distinguished Finnish or foreign scientists and scholars. The title of Academician can be held by no more than twelve Finnish scientists and scholars at a time. There are no restrictions on the number of foreign Academicians.

Finnish holders of the honorary title of Academician

Erik Allardt
Albert de la Chapelle
Nils Erik Enkvist
Olavi Granö
Pekka Jauho
Eino Jutikkala (d. 2006)
Teuvo Kohonen
Olli Lehto
Jorma K. Miettinen
Pirjo Mäkelä
Arto Salomaa
Päiviö Tommila

Foreign holders of the honorary title of Academician

Sir Arnold Burgen, Great Britain
Alfred W. Crosby, USA
Jared M. Diamond, USA
Ludvig Dmitrievish Faddeyev, Russia
Hans Fromm, Germany
Bengt Hultqvist, Sweden
Leon Lederman, USA
Yuri Ivanovish Marchuk, Russia
Sanjit K. Mitra, USA
Martha Nussbaum, USA
Birgitta Odén, Sweden
Richard Peto, Great Britain
Lennart Philipson, USA
Darwin J. Prockop, USA
Stig Strömholm, Sweden
Richard Villems, Estonia

Ongoing research programmes in 2006

Life as Learning, LEARN (2002–2006)

Baltic Sea, BIREME (2003–2005)*

Microbes and Man, MICMAN (2003–2005)*

Wood Material Science (2003–2006)**

Environmental, Societal and Health Effects of Genetically Modified Organisms, ESGEMO (2004–2007)

Future Electronics, TULE (2004–2006)

Health Services Research, TERTTU (2004–2007)

Industrial Design (2004–2007)

Russia in Flux (2004–2007)

Social Capital and Networks of Trust, SOCA (2004–2007)

Systems Biology and Bioinformatics, SYSBIO (2004–2007)

Application of Information Technology in Mechanical, Civil and Automation Engineering, KITARA (2005–2009)

Environment and Law, ENVLAW (2005–2008)

Business Know-how, LIIKE2 (2006–2009)

Nanoscience, FinNano (2006–2010)

Neuroscience, NEURO (2006–2009)

Nutrition, Food and Health, ELVIRA (2006–2010)

Sustainable Production and Products, KETJU (2006–2010)

*Part of the projects continued in 2006.

** The Academy took part in the research programme through targeted call.

Academy Professors in 2006

Lauri Aaltonen
1 Aug 2002–31 Jul 2007
Molecular Background of Hereditary Cancer
University of Helsinki

Helena Aksela
1 Aug 2001–31 Jul 2006
Electron Spectroscopy and Structure of Atoms and Molecules Using Synchrotron
University of Oulu

Risto Alapuro
1 Aug 2005–31 Jul 2009
Spaces of Democracy, Association and Political Culture in Finland in a Comparative Perspective
University of Helsinki

Rauno Alatalo
1 Aug 2004–31 Jul 2009
Individual Performance – Inheritance, Maternal Effects and Sexual Selection
University of Jyväskylä

Kari Alitalo
as from 1 Aug 1993 with tenure
Molecular Biology of Cancer
University of Helsinki

Eva-Mari Aro
1 Aug 1998–31 Jul 2008
Dynamics and Signaling in Photosystem II
University of Turku

Kari Astala
1 Aug 2006–31 Jul 2011
Geometric Analysis and Applications
University of Helsinki

Jaakko Astola
1 Aug 2001–31 Jul 2006
Signal Processing Algorithm Group
Tampere University of Technology

Ralph-Johan Back
1 Aug 2002–31 Jul 2007
Formal Methods in Software Construction
Åbo Akademi University

Dennis Bamford
1 Aug 2002–31 Jul 2007
Structures of Macromolecular Assemblies and Functions of Molecular
University of Helsinki

Ilkka Hanski
1 Aug 1996–31 Jul 2011
Metapopulation Biology
University of Helsinki

Marjatta Hietala
1 Aug 2002–31 Jul 2007
Scholars, Science, Universities and Networks as Making Cities Attractive
University of Tampere

Olli Ikkala
1 Aug 2005–31 Jul 2010
Functional Materials Based on Hierarchical Self-Assembly of Synthetic and Biological Polymers
Helsinki University of Technology

Howard Jacobs
1 Aug 2006–31 Jul 2011
Mitochondria, Ageing and Disease
University of Tampere

Sirpa Jalkanen
1 Aug 1996–31 Jul 2006
Mechanism Controlling Cell Traffic in Malignancies and Inflammations
University of Turku

Kalevi Järvelin
1 Aug 2004–31 Jul 2009
Multi-lingual and Task-Based Information Retrieval
University of Tampere

Kai Kaila
1 Aug 1996–31 Jul 2006
GABA Ergic Transmission: Mechanisms Underlying Neuronal Communication, Development and Pathophysiology
University of Helsinki

Olli-Pekka Kallioniemi
1 Aug 2004–31 Jul 2009
Functional and Translational Canceromics
VTT Technical Research Centre of Finland

Kimmo Kaski
1 Aug 1996–31 Jul 2006
Computational Science and Engineering
Helsinki University of Technology

Seppo Kellomäki
1 Aug 2001–31 Jul 2006
Dynamics and Modelling of the Functioning and Structure of Forest Ecosystem with Implications for the Sustainability of the Forest Production and Climate Change Impacts
University of Joensuu

Simo Knuuttila
1 Aug 1994–31 Jul 2009
1 The History of the Philosophy of Mind, 2 From Philosophy to Science, 3 Medieval Trinitarian Theology
University of Helsinki

Martti Koskenniemi
1 Aug 2005–31 Jul 2010
The Limits of International Law
University of Helsinki

Erkki Koskela
1 Aug 2006–31 Jul 2011
Equilibrium Unemployment, Optimal Taxation and Forest Economics
University of Helsinki

Juha Kostamovaara
1 Aug 2006–31 Jul 2011
Design of High-speed Integrated Circuits and Devices
University of Oulu

Jussi Kukkonen
1 Aug 2005–31 Jul 2010
Ecotoxicology of Natural Organic Material (nom) in Aquatic Systems: Characterization and Effects on Contaminants and Organisms
University of Joensuu

Markku Kulmala
1 Aug 2004–31 Jul 2009
Formation and Growth of Atmospheric Aerosols
University of Helsinki

Antti Kupiainen
1 Aug 1999–31 Jul 2009
Mathematical Physics
University of Helsinki

Markku Laakso
1 Aug 2005–31 Jul 2010
Identification of New Genes for Type 2 Diabetes
University of Kuopio

Markku Leskelä
1 Aug 2004–31 Jul 2009
Nanomaterials and Nanostructures via Metalorganic Synthesis and Deposition of Thin Films
University of Helsinki

Heikki Mannila
1 Aug 2004–31 Jul 2009
Algorithmic Pattern Discovery and Theory of Data Mining
Helsinki University of Technology

Juha Merilä
1 Aug 2006–31 Jul 2011
Evolutionary Genetics of Adaptation in the Wild
University of Helsinki

Uskali Mäki
1 Aug 2006–31 Jul 2011
Trends and Tensions in Intellectual Integration: Studies on Inter-disciplinary and Inter-theoretic Relations in the Social Sciences, with Special Attention to the Role and Credibility of Economics
Erasmus University

Risto Nieminen
1 Aug 2003–31 Jul 2008
Computational and Theoretical Materials Physics
Helsinki University of Technology

Kevät Nousiainen
1 Aug 2004–31 Jul 2009
Egalitarian Contentions
Minna Canth Academy Professorship (Women's Studies and Gender Research)
University of Helsinki

Hannu Nurmi
1 Aug 2003–31 Jul 2008
Studies on Models of Political Institutions
University of Turku

Risto Näätänen
as from 1 Aug 1998 with tenure
Cognitive Function and Its Neural Basis
University of Helsinki

Leena Peltonen-Palotie
1 Aug 2003–31 Jul 2008
Genomwide Analyses of the Background of Common Diseases
National Public Health Institute and University of Helsinki

Heikki Räisänen
1 Aug 2001–31 Jul 2006
Christianity in Making: An Alternative to 'New Testament Theology' from the Perspective of Religious Studies
University of Helsinki

Riitta Salmelin
1 Aug 2006–31 Jul 2011
Neural Organisation of Language Function
Helsinki University of Technology

Mikko Sams
1 Aug 2002–31 Jul 2007
Neurocognitive Mechanicsms of Multisensory Perception
Helsinki University of Technology

Ari Sihvola
1 Aug 2005–31 Jul 2010
Electromagnetics of Geophysical, Composite and Metamaterials
Helsinki University of Technology

Lea Sistonen
1 Aug 2004–31 Jul 2009
Regulation of the Heat Shock Transcription Factors HSF1 and HSF2
Åbo Akademi University

Kaarina Sivonen
1 Aug 2000–31 Jul 2010
Cyanobacteria and Their Bioactive Compounds
University of Helsinki

Jari Turunen
1 Aug 2005–31 Jul 2010
Foundations of Wave-Optical Engineering
University of Joensuu

Jari Valkonen
1 Aug 2006–31 Jul 2011
Molecular Mechanisms of Resistance to Potyviruses
University of Helsinki

Kim Wallin
1 Aug 2006–31 Jul 2011
Micromechanism-based Modelling of Fracture
VTT Technical Research Centre of Finland

Mårten Wikström
1 Aug 1996–31 Jul 2006
The Catalysts of Cell Respiration – Molecular Dynamics, Structure and Pathophysiology
University of Helsinki

Seppo Ylä-Herttuala
1 Aug 2005–31 Jul 2010
Biology and Applications of Therapeutic Vascular Growth
University of Kuopio

Centres of Excellence in research in 2006

Units nominated for the national Centre of Excellence programme 2002–2007

Applied Microbiology
Research Unit
University of Helsinki
Academy Professor Kaarina Sivonen

Bio- and Nanopolymers
Research Group
Helsinki University of Technology, University of Helsinki and University of Turku,
Professor Jukka Seppälä

Centre for Environmental Health Risk Assessment
National Public Health Institute and University of Helsinki
Research Professor Juha Pekkanen

Centre of Excellence for Research in Cardiovascular Diseases and Type 2 Diabetes
University of Kuopio
Academy Professor
Seppo Ylä-Herttuala

Centre of Population Genetic Analyses
University of Oulu and University of Helsinki
Professor Pekka Pamilo

Developmental Biology
Research Programme
University of Helsinki
Professor Irma Thesleff

Finnish Research Unit for Mitochondrial Biogenesis and Disease (FinMIT)
University of Tampere and University of Helsinki
Academy Professor
Howard Jacobs

Formal Methods in Programming
Åbo Akademi University
Academy Professor
Ralph-Johan Back

From Data to Knowledge
Research Unit
University of Helsinki and Helsinki University of Technology
Professor Esko Ukkonen

Helsinki Brain Research Centre
University of Helsinki, Helsinki University of Technology, and Helsinki and Uusimaa Hospital District
Academy Professor Risto Näätänen

History of Mind Research Unit
University of Helsinki and University of Jyväskylä
Academy Professor Simo Knuuttila

Research Programme on Male Reproductive Health
University of Turku
Professor Ilpo Huhtaniemi

Research Unit of Geometric Analysis and Mathematical Physics
University of Helsinki and University of Jyväskylä
Professor Pertti Mattila

Research Unit on Economic Structures and Growth
University of Helsinki
Professor Erkki Koskela

Research Unit on Physics, Chemistry and Biology of Atmospheric Composition and Climate Change
University of Helsinki, University of Kuopio and Finnish Meteorological Institute
Academy Professor
Markku Kulmala

Smart and Novel Radios
Research Unit
Helsinki University of Technology
Professor Antti Räisänen

Units nominated for the national Centre of Excellence programme 2006–2011

CoE in Ancient Greek Written Sources
University of Helsinki
Professor Jaakko Frösén

CoE in Cancer Biology
University of Helsinki
Academy Professor Kari Alitalo

CoE in Complex Disease Genetics
National Public Health Institute, University of Helsinki and Folkhälsan
Academy Professor
Leena Peltonen

CoE in Computational Complex Systems Research
Helsinki University of Technology
Academy Professor Kimmo Kaski

CoE in Computational Nanoscience
Helsinki University of Technology
Academy Professor
Risto Nieminen

CoE in Evolutionary Genetics and Physiology
University of Turku and University of Helsinki
Professor Mikko Nikinmaa

CoE in Evolutionary Research
University of Jyväskylä
Academy Professor Rauno Alatalo

CoE in Global Governance Research
University of Helsinki and University of Turku
Professor Jan Klabbers

CoE in Low Temperature Quantum Phenomena and Devices
Helsinki University of Technology and VTT Technical Research Centre of Finland
Professor Mikko Paalanen

CoE in Political Thought and Conceptual Change
University of Jyväskylä
Professor Kari Palonen

CoE in Process Chemistry
Åbo Akademi University
Professor Mikko Hupa

CoE in Signal Processing
Tampere University of Technology
Academy Professor Jaakko Astola

CoE for Study of Variation, Contacts and Change in English
University of Helsinki and University of Jyväskylä
Professor Terttu Nevalainen

CoE in Systems Neuroscience and Neuroimaging Research
Helsinki University of Technology and University of Helsinki
Professor Riitta Hari

Finnish CoE in Adaptive Informatics Research
Helsinki University of Technology
Professor Erkki Oja

Finnish CoE in Computational Molecular Science
University of Helsinki
Professor Pekka Pyykkö

Finnish CoE in Inverse Problems
University of Helsinki, University of Kuopio, Helsinki University of Technology, University of Oulu, Lappeenranta University of Technology
Professor Lassi Päivärinta

Finnish CoE in Learning and Motivation Research
University of Jyväskylä
Professor Jari-Erik Nurmi

Finnish CoE in Metapopulation Research
University of Helsinki
Academy Professor Ilkka Hanski

Finnish CoE in Nuclear and Accelerator Based Physics
University of Jyväskylä
Professor Rauno Julin

Finnish CoE in Plant Signal Research
University of Helsinki and University of Turku
Professor Tapio Palva

Finnish CoE in Translational Genome-Scale Biology
VTT Technical Research Centre of Finland, University of Turku, University of Helsinki
Academy Professor
Olli-Pekka Kallioniemi

Finnish CoE in Virus Research
University of Helsinki
Academy Professor
Dennis Bamford

Nordic Centres of Excellence in Global Change Research 2003–2007

Nordic Centre for Studies of Ecosystem Carbon Exchange and Its Interactions with the Climate System
Lund University
Professor Anders Lindroth

Research Centre on Biosphere – Aerosol – Cloud – Climate Interactions
University of Helsinki
Academy Professor Markku Kulmala

The Dynamics of Ecological Systems under the Influence of Climatic Variation
University of Oslo
Professor Nils Chr. Stenseth

The Nordic Centre for Luminescence Research: Supporting Climate Change Research by the Provision of Precise and Accurate Chronological Control
University of Aarhus
Associate Professor Andrew Murray

Nordic Centres of Excellence in Molecular Medicine 2004–2009

Nordic Centre of Excellence for Research in Water Imbalance Related Disorders
University of Oslo
Professor Ole Petter Ottersen

Nordic Centre of Excellence in Neurodegeneration
Lund University
Professor Patrik Brundin

Nordic Network of Excellence in Disease Genetics
University of Helsinki
Academy Professor Leena Peltonen

Centres of Excellence in Humanities and Social Sciences in 2005–2010

Cognitive Control: Behavioural and Brain Studies of Cognitive Control in Attention, Perception, Language, Memory, and Emotion
Umeå University
Professor Lars Nyberg

Empirical Labor Economics
Uppsala University
Professor Per-Anders Edin

The Nordic Countries and Medieval Expansion of Europe. New Interpretations of a Common Past
University of Bergen
Professor Sverre Bagge

NORMS – Nordic Centre of Excellence in Microcomparative Syntax
University of Tromsø
Professor Peter Svenonius

Academy of Finland and ERA-NETs in 2006

Coordination

BONUS, BONUS for the Baltic Sea Science – Network Funding Agencies, 2004–2007

NORFACE, New Opportunities for Research Funding Co-operation in Europe – A Strategy for Social Sciences, 2004–2008

Partners

ERA-CHEMISTRY, Implementation of Joint bottom-up European Programmes in Chemistry, 2004–2006

ERA-AGE, European Research Area in Aging Research, 2004–2007

ERA-PG, European Research Area in Plant Genomics, 2004–2007

WoodWisdom-Net, Networking and Integration of National Programmes in the Area of Wood Material Science, 2004–2007

MarinERA, National and Regional Marine RTD Activities in Europe, 2004–2008

Pathogenomics, Trans-European Cooperation and Coordination of Genome Sequencing Functional Genomics of Human-Pathogenic Microorganisms, 2004–2009

NanoSci-ERA, NanoScience in the European Research Area, 2005–2008

CIRCLE, Climate Impact Research Coordination within a Larger Europe, 2005–2009

CO-REACH, Co-operation of Research between Europe and China, 2005–2009

HERA, Humanities in the European Research Area, 2005–2009

Matera, Material Science and Engineering in Europe, 2005–2009

ERA-SAGE, European Research Area on Societal Aspects of Genomics, 2005–2010

ERASysBio, Towards a European Research Area for Systems Biology, 2006–2009

Academy of Finland publications in 2006

SIGHT 2006: Publications and other material related to the assessment of the state, quality and impact of Finnish scientific research

Impact of Academy of Finland research funding

Sivistystä ei voi tuoda – tutkija-puheenvuoroja kulttuurin ja yhteiskunnan tutkimuksen vaikuttavuudesta. Publications of the Academy of Finland 5/2006. (Available in English: Civilisation cannot be imported. Publications of the Academy of Finland 3/07).

Suomen Akatemian rahoittama luonnontieteiden ja tekniikan alojen tutkimus: Arviointi hankkeiden vaikuttavuuksista. Publications of the Academy of Finland 6/2006.

Tutkimuksen vaikuttavuus bio-tieteiden ja ympäristön tutkimuksen aloilla. Publications of the Academy of Finland 7/2006.

Strategisella rahoituksella vaikuttavampaa tutkimusta? Kolme esimerkkiä vaikutusten ja vaikuttavuuden arvioinnista terveyden tutkimuksen alalta. Publications of the Academy of Finland 8/2006.

Kanninen Sami & Lemola Tarmo: Methods for Evaluating the Impact of Basic Research Funding: An Analysis of Recent International Evaluation Activity. Advansis Ltd. Publications of the Academy of Finland 9/2006.

Suomen Akatemian tutkimus-rahoituksen vaikuttavuus. Arviointiraportti. Publications of the Academy of Finland 11/2006.

Standard and structure of Finnish scientific research

Lehvo Annamaija & Nuutinen Anu: Finnish Science in International Comparison: A Bibliometric Analysis. Publications of the Academy of Finland 15/2006.

Foresighting: FinnSight 2015

FinnSight 2015: Tieteen, teknologian ja yhteiskunnan näkymät, Suomen Akatemia ja Tekes, Helsinki 2006.

FinnSight 2015: Tieteen, teknologian ja yhteiskunnan näkymät (synteesiraportti), Suomen Akatemia ja Tekes, Helsinki 2006.

FinnSight 2015: The Outlook for Science, Technology and Society (synthesis report), Academy of Finland and Tekes, Helsinki 2006.

The synthesis report is also available in Japanese and Chinese.

Other publications of the Academy of Finland publication series

1/06 Kehitystutkimuksen strategia.

2/06 Food Sciences and Related Research in Finland 2000–2004. International Evaluation.

3/06 “Se on kompromissin tulos”, Suomen Akatemian yhteis-rahoitteiset tutkimusohjelmat neuvotteluina: Rahoittajien näkökulma. Laura Valkeasuo.

4/06 Immateriaalioikeuden suunnattu haku 2001–2004. Arviointiraportti.

10/06 Development Research Strategy.

12/06 Research Programme on Finnish Companies and the Challenges of Globalisation. Evaluation Report.

13/06 Antarctic Research in Finland 1998–2005: International Evaluation.

14/06 Energy Research in Finland 1999–2005. Evaluation Report.

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