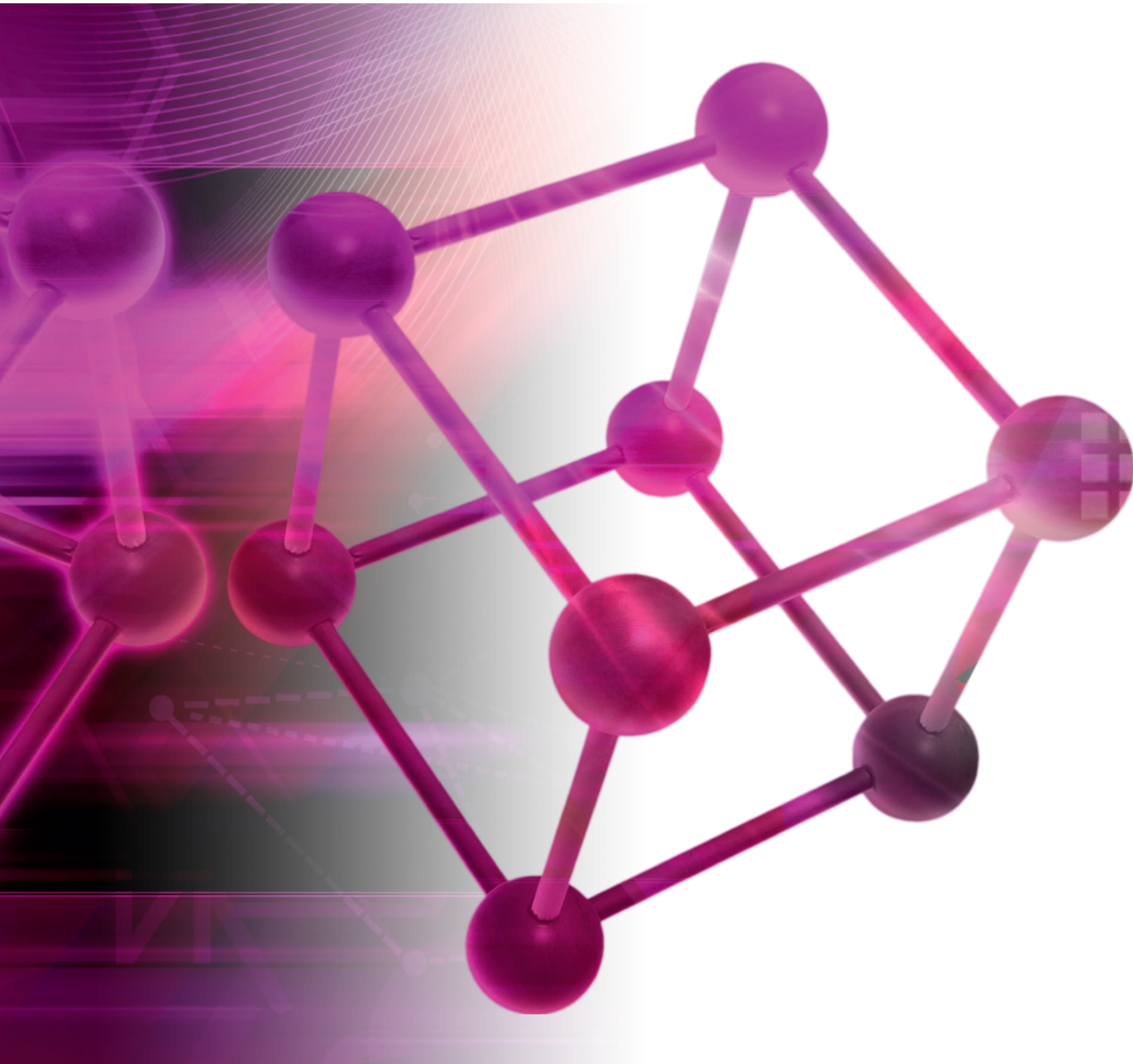


# Annual Report 2009



ACADEMY OF FINLAND  
RESEARCH FUNDING AND EXPERTISE



**JANUARY:** Finnish researchers were highly successful with their funding applications to the European Research Council.

**FEBRUARY:** Social impact assessments were completed for Centre of Excellence programmes.

**MARCH:** The Academy of Finland and the Finnish Council of University Rectors signed up to the European Charter for Researchers and to the Code of Conduct for the Recruitment of Researchers.

**APRIL:** The Academy appointed a graduate school support group to prepare the 2010 graduate school call and to develop procedures for monitoring and evaluating the graduate school system.

**MAY:** The Ministry of Education Finnish Science Award was given to Professor Riitta Hari, Helsinki University of Technology. The Academy of Finland Awards were granted in the autumn to Miia Kivipelto and Otso Ovaskainen, respectively.

**JUNE-AUGUST:** Three new Academicians of Science were appointed: the honorary title was conferred upon Anna-Leena Siikala, Erkki Ruoslahti and Leena Peltonen.

**SEPTEMBER:** Discussions at the Academy's Science Café and the Night of Science addressed the riddle that Darwin was unable to resolve. The year 2009 was Charles Darwin's 200th birthday.

**OCTOBER:** To celebrate the bicentennial of public administration, the Academy organised an Open Doors day.

**NOVEMBER:** The Academy published its latest review of the state and quality of scientific research in Finland.

**DECEMBER:** The Academy's Board and Research Councils held the last meetings of their three-year term.

# CONTENTS

3   Contents	18   Operating environment	Appendices
4   2009 in brief	20   Review and evaluation activities	32   Academy Board
4   Message from the President: New challenges to science policy	21   Research funding	32   Research Council members
6   Academy of Finland Research Councils 2007–2009	24   Research programmes	32   Management and Unit Directors
11   Research Council reports for 2009	26   Centres of Excellence	32   Research programmes
11   Research Council for Biosciences and Environment	26   International activities	33   Finnish Centres of Excellence in Research
12   Research Council for Culture and Society	30   Advancement of research careers	33   Nordic Centres of Excellence in Research
14   Research Council for Natural Sciences and Engineering	31   Academy personnel	34   International cooperation
16   Research Council for Health		



## MESSAGE FROM THE PRESIDENT: NEW CHALLENGES TO SCIENCE POLICY

*The year 2009* saw a number of significant reviews and restructurings in the Finnish science field that will continue to reverberate for years to come. In Europe, too, work was continued to create new visions for science policy.

Parliament adopted the Act on the Academy of Finland, following exceptional interest from the research community and the general public. Particularly the position of Academy Professors and Academy Research Fellows gave rise to a great deal of debate. One new seat was added to the Academy Board for an outside member. Under the changes made to the legal status of universities, funding awarded by the Academy to university researchers is now defined as discretionary government transfers. The adoption of the full cost model marked another significant change in the research funding system.

Inputs by the European Research Council (ERC) in particular contributed to strengthen the position of scientific research within European research policy. Academy Professors, Academy Research Fellows and other Finnish-based researchers had considerable success with their funding applications to the ERC. It is important that our talented scientists and researchers are encouraged to apply more often for funding from foreign sources.

## 2009 IN BRIEF

- Academy of Finland research funding accounted for 16.3 per cent of total central government R&D expenditure.
- The total value of Academy funding decisions came to 304 million euros.
- The Academy had 13 ongoing research programmes.
- There were two ongoing Finnish Centre of Excellence programmes, in which funding was provided to 41 CoEs.
- The Academy had national responsibility in four specific programmes under the EU's 7th Framework Programme for Research.
- The Academy was involved as a partner in 14 ERA-NETs and it was coordinator of one.
- The Academy was involved in three Nordic NORIA-nets.
- The Academy placed special emphasis on the importance of cooperation with major European countries and the Nordic countries; with Brazil, Chile, China, India, Japan, Russia and the United States.



Work continued in 2009 to outline the future challenges for European research policy. In particular, the European Research Area Board (ERAB) published its strategy on preparing Europe for a new renaissance, and the European Heads of Research Councils (EURO-HORCs) and the European Science Foundation (ESF) drew up a strategic programme for the development of a competitive European Research Area (ERA). Both these documents emphasise the key role that scientific research has to play in advancing and developing civilization, culture and society and in meeting the future. They will also inform our own development efforts at the Academy.

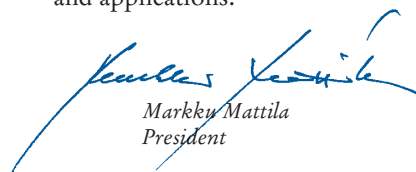
In 2009 the Academy was closely involved in the planning of Joint Programming at EU level.

*The Academy's review of the state and quality* of scientific research in Finland was completed in late autumn 2009. It concluded that research funding in Finland continues at a high level. One of the major assets of Finnish science is that it has access to large numbers of well-trained and qualified researchers. The bulk of funding goes to researcher training, but this has detracted from the growth and impact of scientific publishing. The conditions for scientific research at universities are not always optimal. Upgrading research infrastructures is therefore an urgent priority.

An international evaluation conducted of the Finnish innovation system drew attention to the lack of cohesion within the Finnish research system, failings in university funding mechanisms and insufficient international networking. Both this and the 2009 state of science review emphasise the importance of raising the overall quality of science and research. They provide the Academy with a sound basis for future science policy analysis and direction and for the development of its own operation.

*For the members of the Academy Board and Research Councils*, 2009 marked the last year of their three-year term. This period has seen some difficult and exciting challenges in the fields of both national and international science policy.

I would like to thank all our employees and all members of the Academy Board and Research Councils for their dedicated and successful efforts to serve the best interests of Finnish science. We now have in place a strong platform from which to further promote scientific research and to continue the search for new results and applications.



Markku Mattila  
President



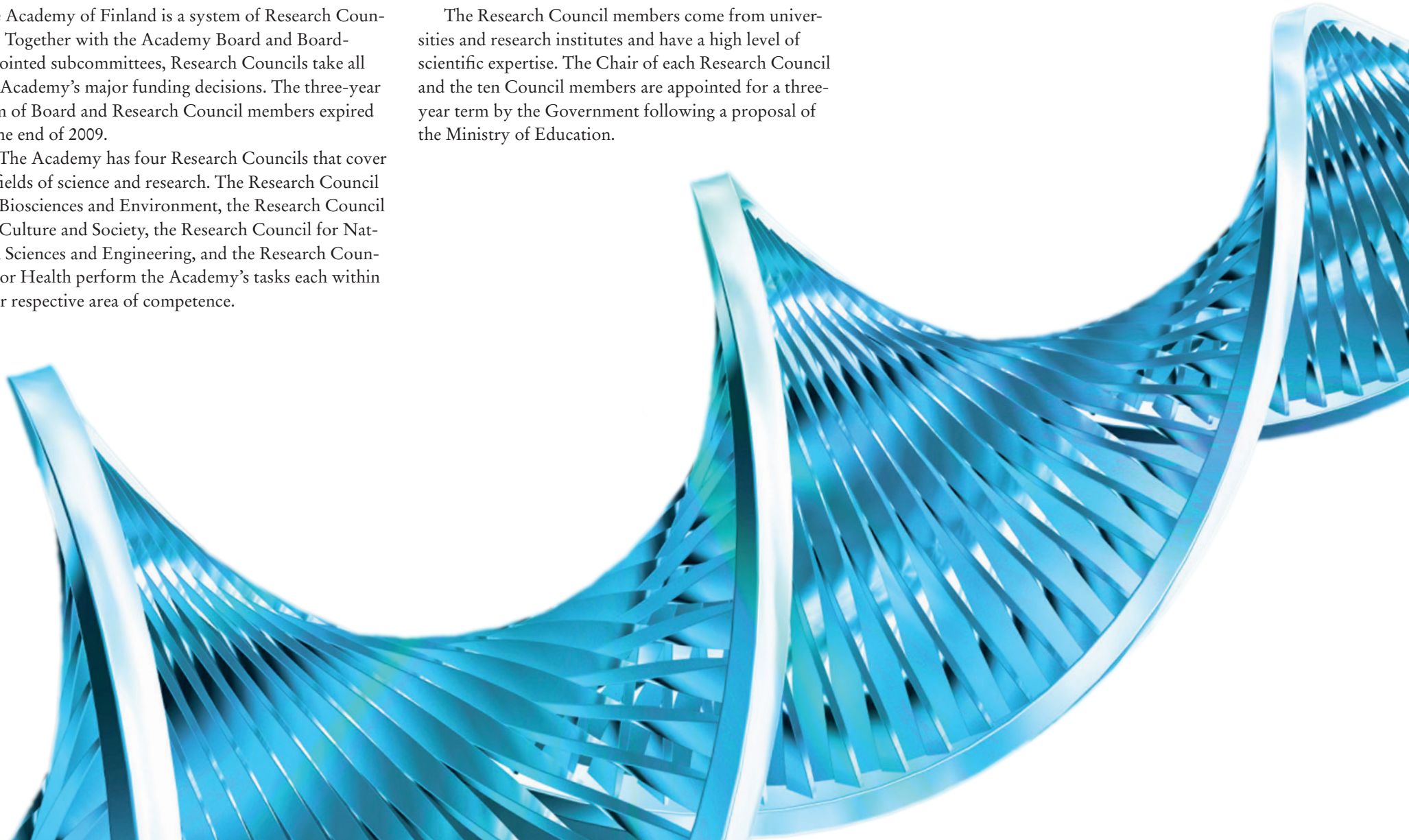
# ACADEMY OF FINLAND RESEARCH COUNCILS 2007–2009

## *System of Research Councils lays the foundation for success*

The Academy of Finland is a system of Research Councils. Together with the Academy Board and Board-appointed subcommittees, Research Councils take all the Academy's major funding decisions. The three-year term of Board and Research Council members expired at the end of 2009.

The Academy has four Research Councils that cover all fields of science and research. The Research Council for Biosciences and Environment, the Research Council for Culture and Society, the Research Council for Natural Sciences and Engineering, and the Research Council for Health perform the Academy's tasks each within their respective area of competence.

The Research Council members come from universities and research institutes and have a high level of scientific expertise. The Chair of each Research Council and the ten Council members are appointed for a three-year term by the Government following a proposal of the Ministry of Education.





## RESEARCH COUNCIL FOR BIOSCIENCES AND ENVIRONMENT 2007–2009:

### *Real innovations stem from scientific freedom*

“Over the past three years, the Research Council for Biosciences and Environment has awarded close to 170 million euros in research funding, which has provided opportunities for almost 2,000 researchers to work in various projects. This is our most significant achievement,” says Professor Paavo Pelkonen, University of Eastern Finland, Chair of the Research Council in 2007–2009.

Projects funded have included research into the culture of fear in the field of social geography; the personality and learning ability of tits in the field of evolutionary biology; and the harnessing of plant photosynthesis for energy production in the field of molecular biology. “The international evaluation of water research showed that the Research Council’s funding policy and investments in Academy research programmes have provided a major boost to this area that will have great future significance,” says Professor Liselotte Sundström, University of Helsinki, Vice Chair of the Research Council.

“The funding made available to evolutionary genomics brings together three strong existing disciplines – ecology, evolutionary biology and genomics – and is essential to maintaining the competitive edge of Finnish research. The timing was also just right because it coincided with the European Science Foundation’s EUROCORES call.”

### *One overarching objective: high-quality research.*

The Research Council’s single most important goal has been to maintain the quality of research and to promote high-level research. At the same time, it has sought to

enhance the social impact of research. “It’s important that in the future the Research Council continues to place premium on the quality of research projects. And universities should concentrate not on the quantity but the quality of their doctoral theses,” they both concur.

There are strong grounds for this view: both the review of the current state of scientific research in Finland and the international evaluation of the Finnish innovation system found that there had been a slight dip in the overall quality of research. In some fields of biosciences and environmental research it is felt that the situation now calls for intervention.

Professors Pelkonen and Sundström believe that part of the reason for the downward trend in relative citation impacts lies in the fact that other countries have only recently got up to speed in disciplines such as ecology and forestry where Finland has long had a pioneering role.

One of the main sources of concern for the Research Council has been the declining funding base for basic research. The quality and reach of Finnish research are bound to suffer unless something is done to reverse the situation.

“The thinking today is that new inventions and innovations can be forced by providing funding to just a few top units. However, history has taught us that new breakthroughs and genuinely new innovations stem from scientific freedom and broadly based research,” Sundström points out.

*The importance of international engagement.* One of the Research Council’s priorities has been to support and develop research careers, particularly among younger people. Professor Pelkonen insists that the focus of funding should be shifted to later stages of the research career because as it is, “the competition for funding is overly



intense, especially for senior researchers”. This would also contribute to improving the quality of research.

“Mobility has fallen short of expected levels, so this is another area where there’s plenty of work to do,” Pelkonen says. “It’s important that researchers move out and get experience working in other countries by the time they reach the postdoctoral stage. We also need to attract more foreign researchers and PhD students into the country.”



## RESEARCH COUNCIL FOR CULTURE AND SOCIETY 2007–2009:

### *Changing world situation places research under mounting pressures of expectation*

During 2007–2009, the Research Council for Culture and Society awarded funding to support high-quality basic research that has shed new light on cultural capital, identity and diversity, for example. Furthermore, it has

made funding available to research into issues of current interest, such as immigration and basic security.

“New research evidence can provide support for decision-making, the adoption of new social practices and the development of the public sector. It’s important to general education and to our cultural self-understanding,” says Professor Eila Helander, University of Helsinki, who chaired the Research Council from 2007 to 2009.

“There is a growing sense of unease and uncertainty about the world in which we live, and that has contributed to place social and cultural research under mounting pressures of expectation,” says Professor Pertti Haapala, University of Tampere, Vice Chair of the Research Council in 2007–2009. “The increasing prominence of global perspectives and ethics in this field has had largely the same effect. The eternal question, for cultural and social research in particular, is how people get along with one another.”

Increasingly, today’s complex research questions are addressed from a multidisciplinary angle. Social and cultural research disciplines play a crucial role in studying children’s and adolescents’ well-being, health, substance use and addictions as well as the Baltic Sea, the climate, ubiquitous computing and communication – in line with the Research Council’s declared objectives.

*Strengths and areas for improvement.* The efforts invested in the development of researcher training have been highly successful. The quality of researcher training and the level of methodological rigour have improved, and the perspectives of research have diversified.

“It’s important to get the most talented young people started on a research career, but this is far from unproblematic because there simply are not enough funding opportunities for people who have achieved and

even exceeded the Academy Research Fellow level,” Haapala observes. Research teams are now encouraged to hire PhD-level researchers rather than PhD students, and things are beginning to change.

A focused effort has been made to promote international mobility and cooperation. The Research Council has been actively involved in developing the European Research Area, contributing to research collaboration both through the European Science Foundation and EU ERA-NET programmes. In the education field, bilateral research collaboration was started with Chile.

“By contrast, the efforts to increase mobility between academia and industry have not had the desired results. Researchers out in the field have not been very interested in this funding opportunity,” Helander says.

*New insights, far-reaching implications.* “New initiatives and openings are essential for the constant development of science and its various disciplines. For example, advances in information technology might well shed further light on issues that have already received extensive research attention, but what matters most is to create environments that are conducive to new ideas and insights,” Haapala and Helander continue.

“It’s also important to get the new knowledge across more effectively than before, both to the science community and to the general public.”

The ongoing infrastructure debate has drawn attention to questions of research data sources in the humanities and social sciences. High on the agenda are such issues as the improvement of data collection and use, the promotion of free access to information, and the strengthening of expertise related to the archiving of research data.



## RESEARCH COUNCIL FOR NATURAL SCIENCES AND ENGINEERING 2007–2009:

### *The position of basic research must be secured*

The Research Council for Natural Sciences and Engineering has three overriding objectives: to maintain the high quality of research, to promote researcher training and equality, and to support infrastructure projects.

“We’ve wanted to support cutting-edge research and in that we’ve succeeded very well,” say Professor Erkki Oja from the Aalto University School of Science and Technology, Chair of the Research Council in 2007–2009, and Research Professor Johanna Buchert from VTT Finland, Vice Chair during the past three years.

“With very few exceptions we’ve been in the position to fund the projects whose research plans have received the highest scores for scientific quality and innovativeness. Funding has been available even to applicants with other ongoing Academy projects.”

General research grants have been awarded to support networking and multidisciplinary cooperation. In 2008, for example, 29 per cent of all applications submitted were approved, but for consortium applications the figure was 38 per cent.

The Research Council’s funding decisions gravitated somewhat towards engineering, because the evidence from various evaluations indicated that mechanical engineering and other hard technology fields were most in need of development.

Referring to the results of recent discipline assessments and the panels convened by the Academy for the current state of science and research review, Professors Oja and Buchert are both keen to stress the importance of high-quality basic research. “It’s crucial that steps are

taken to secure the position of basic research within the Finnish research and innovation system. This is readily appreciated in the natural sciences, but in many engineering fields it seems that business-driven applied research has the upper hand, and that is beginning to hamper the development of Finnish science.”

### *Helping to make the research career more attractive.*

During the past three years much progress has been made in regard to researcher training and equality. Funding support for Postdoctoral Researcher’s projects has been particularly strong. Researcher mobility has been one of the major evaluation criteria. The proportion of successful applications for general research grants has been consistently high for other than applicants at professor level. The percentage of women among funding recipients has almost doubled in the past five years: in 2009 the figure stood at 16 per cent.

“The Academy’s graduate schools play a prominent role in doctoral training, and it’s important that they are integrated into universities’ doctoral training programmes. However, other Academy funding should be targeted at later stages of the research career. This will help to ensure sufficiently ambitious research projects and high-quality publications – which doctoral theses rarely are.”

Professor Oja says that the postdoctoral stage is particularly important. From that stage there must be the option to progress, via competition, to a tenure-track career path. International contacts and mobility must be supported.

*Paper and pencil are not enough.* The Research Council has supported several international infrastructure projects and contributed actively to drafting the Academy’s infrastructure policy.



“We need to do more to protect and develop our research infrastructures, particularly in fields that do a lot of experimental research using sophisticated equipment and datasets. If we allow our infrastructures to decay any further, that will have a devastating effect on the quality of science and on Finland’s competitiveness,” Oja and Buchert point out.

“A new funding mechanism needs to be set up for the acquisition and maintenance of national infrastructures.”



## RESEARCH COUNCIL FOR HEALTH 2007–2009:

### *Urgent measures needed to secure the conditions for clinical research*

“We’ve had some good success in achieving the goals that were set for this term – and we did so on budget – but there still remain some areas of concern. Foremost among these concerns are the state of clinical research

and the waning interest among younger people in research,” says Professor Kalervo Väänänen, Rector of the University of Eastern Finland, who chaired the Research Council for Health from 2007 to 2009.

As has been the practice previously, the Research Council has based its funding decisions primarily on criteria of quality and excellence. To support the career development of clinical researchers, the Council has allocated dedicated annual funding for part-time clinical research positions.

There are high expectations that the Responding to Public Health Challenges research programme, launched in 2009, will generate new knowledge with practical application. “The research programme is focused on the life-cycle management of risk factors that are common to certain major public health challenges, such as cardiovascular disease, diabetes and dementia,” says Professor Anssi Auvinen, University of Tampere, Vice Chair of the Research Council, who has had charge of preparations for the four-year research programme. Allergies and musculoskeletal diseases are also covered in the programme.

“Multidisciplinary projects often combine public health research with behavioural, social and biosciences. A common concern in many of these projects is with the associations between genetic factors, living habits and the social and physical environment.”

The Research Council has been actively involved in the Academy’s international programmes. Professor Väänänen is Chair of the Steering Group for the Research Programme on Neuroscience, a joint venture between Finland, Canada and China. Finnish researchers have played a central role both in joint projects with Chinese partners and in the medical diagnostics projects recently launched with India.

### *Evaluations lend support to operational development.*

Several reviews and evaluations have been conducted in the health research field over the past three years. Professor Väänänen specifically mentions the evaluation of clinical research in Sweden and Finland in 2008–2009. In Finland the evaluation was commissioned by the Research Council for Health and in Sweden by the Scientific Council for Medicine under the Swedish Research Council.

The panel concluded that clinical research in both countries is of a high international standard. Both countries rank above the international average, and some of their biggest research units are world-class.

As far as Finland is concerned, Professor Väänänen believes that the most important observations have to do with the conditions for clinical research. “A clinical research career is no longer a particularly attractive option in Finland. Research environments have deteriorated significantly at many university hospitals. In the municipally-owned hospital system clinical research has all but dried up, and universities have been unable to assume sufficient responsibility for facilitating clinical research.”

“In some respects the relationship of cooperation between health care and the research system in Finland has reached crisis level,” Professor Väänänen says. One of the spillover effects is that young people are beginning to lose interest in research. That, in turn, may very quickly spill over to affect the quality of clinical work.

*A new social contract is needed.* The problems encountered in the field of health research are due in part at least to the sharp decline in public funding. The Council has sought actively to promote debate and discussion about the deteriorating prospects in this field.

# RESEARCH COUNCIL REPORTS 2009

## RESEARCH COUNCIL FOR BIOSCIENCES AND ENVIRONMENT 2009:

### *Promoting international engagement and researcher training*

The Research Council took steps to promote the internationalisation of Finnish research and the mobility of individual researchers. It also persisted with its policy to support researcher training abroad. Funding was made available to 16 researchers who moved abroad on completion of their doctorate to further upgrade their qualifications, to gain international experience and to establish international contacts. As previously, the Research Council was in favour of researchers spending longer periods abroad, and therefore virtually all the projects it funded were scheduled for two years.

The Research Council spent almost 8 million euros to support 27 three-year Postdoctoral Researcher's projects. Around 19 per cent of applicants were granted funding. In addition, one applicant received funding to set up a research team. The Research Council gave special consideration to international mobility and its benefits to the researcher's career progress. Some 70 per cent of the successful applicants for Postdoctoral Researcher's projects conduct part of their research in a foreign-based organisation. The best reviews were received by applicants who had spent a postdoc period abroad before starting their Postdoctoral Researcher's project.

### *Research grants and the applications review process.*

All applications for general research grants, Postdoctoral Researcher's projects and research posts were reviewed by foreign experts. Peer evaluations were conducted in

panels of experts. Research grant applications were reviewed by 69 experts from 18 countries in seven different panels. Applications for research posts were reviewed by 42 experts from 17 countries in three panels.

General research grants were awarded to 34 applicants. The total amount awarded came to 20.2 million euros. Around 21 per cent of all submitted projects were awarded funding. The projects involve one to two researchers and are scheduled to run for three or four years.

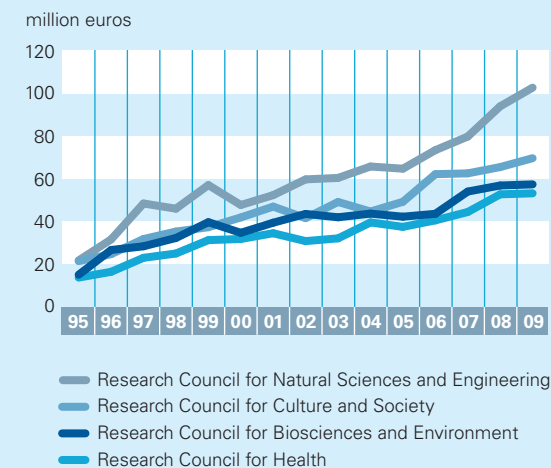
The changeover to the full cost model in 2009 had the effect of significantly swelling the size of applications. The resources available to the Research Council increased only marginally, and consequently the number of projects funded dropped sharply.

*Allocation of funding.* The Research Council announced a targeted call in the field of ecological and evolutionary genomics, which prompted a large number of very high-calibre applications. A total of around 3 million euros was awarded to six applications.

The projects funded are dedicated to exploring basic evolutionary processes. In a research tradition that goes back 150 years, the most eminent scientists are now applying ultramodern tools. Their interests include internal biological clock mechanisms, the genetic regulation of brain hormone systems and the impacts of habitat fragmentation on genome structure and gene expression.

Results from many of these projects will also help prepare for climate change. Good examples of the immediate application of high-level basic research are provided by projects concerned with the impacts of drought-induced stress on the barley genome and with how these impacts are reflected in harvest quality and quantity in the long term, as well as by projects explor-

Figure 1. Academy of Finland research funding by Research Council in 2007–2009



ing fish adaptation to temperature changes caused by climate change. The results of experiments conducted with the three-spined stickleback (*Gasterosteus aculeatus*) can be applied to salmon, cod and other commercially valuable species.

The Research Council's contributions to the field of ecological and evolutionary genomics were complemented by its participation in the European Science Foundation's EUROCORES programme EuroEEFG (Ecological and Evolutionary Functional Genomics). Funding was awarded to Finnish scientists involved in two European projects.



*Academy Research Fellowships.* The Research Council made 16 new appointments to Academy Research Fellowships. The success rate for applicants rose from 9 per cent in 2008 to 14 per cent. The new Academy Research Fellows include a number of foreign nationals who will be working in Finland and Finnish nationals who in turn will spend part of their term abroad. The persons appointed to these positions represent different fields of science, reflecting the diversity and broad spectrum of disciplines hosted by the Research Council.

*Impact of water research.* The social impact of research in the water sector was evaluated during 2009. The evaluation covered the cooperation between researchers and end-users of research as well as the contents, challenges and outcomes of cooperation. It involved 17 research organisations and their key partners.

The evaluation concluded that cooperation among research organisations and their partners is characterised by a broad value base, a diversity of objectives and a networked structure. The underlying value base may range from nature conservation values through to economic and technological values. Research collaboration is often geared to advancing different social values at one and the same time. The networks of cooperation are lean and light and based on the groups of people involved knowing and trusting one another.

To maximise the potential of this cooperation it is necessary first of all to find a common language and to align the different time horizons of research and other parties. It is recommended that a more conscious effort is made to plan ahead for cooperation so that it is easier to reconcile those different time horizons and to develop more lasting and more expanded networks. Further-

more, steps are needed to make research knowledge more easily accessible and digestible. End-users of research results urged scientists to voice their positions more clearly and to take more active part in public debate on social issues.

*In 2009, the Research Council for Biosciences and Environment awarded 57.3 million euros in research funding. The Council covers the following disciplines:*

- 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

## RESEARCH COUNCIL FOR CULTURE AND SOCIETY 2009:

### *Academy involved in record-breaking programme*

The number of doctorates completed under the Research Council for Culture and Society far exceeds the number of jobs available for PhD graduates. For this reason the Research Council has urged universities to spend project funding on hiring researchers who have already completed their doctorate rather than postgraduate students.

The Research Council has given special emphasis to the placement of PhD graduates in other than basic research positions. This has been supported by means of funding for workplace mobility, which allows PhD-level researchers to apply for 12-month funding for purposes of moving from academia to industry or vice versa. In both cases, the funding is awarded for implementation of a research plan.

Over the past three years, only very few researchers showed an interest and applied. Therefore there was no chance to see how good examples might help to create new jobs for people with a researcher training or how research knowledge is generated and disseminated in the interaction and exchange between different kinds of organisations and cultures.

*The Research Council has consistently emphasised the breadth and diversity of research. It has sought to keep the size of research grants in check and so ensure that funding can be made available to as many high-quality projects as possible. In 2009, project funding was awarded to 55 projects: the average grant for a four-*

year project was 500,000 euros. The total number of projects in 2009 was slightly down on the previous year because of new budgeting rules which required an increased volume of funding per project.

*The strengths of research in cultural and social fields* are documented in the latest report on the current state of scientific research in Finland. These fields of research have restructured in terms of both their methods and research questions. Methodological skills and competencies and the quality of research overall have improved based on the input of graduate schools and the closer cooperation among senior researchers.

Advances in information technology have made the processing of large datasets a matter of routine in several fields. Philology and the production of critical scientific editions offer good examples of how old research questions are being reframed by virtue of new methods. The integration of qualitative and quantitative methods as well as multidisciplinary cooperation are important sources of enrichment in various fields.

All applicants to the Academy are required to submit a materials management plan as part of their research plan. Introduced just over a year ago, this new procedure helps to improve the quality of research and draws attention to questions of research ethics, such as the conditions for data use. The general principle is that all data and materials acquired by public money are joint property.

Questions around research data and materials have come to the fore because of international recommendations and national research infrastructure policy. Universal access to and the shared use of research materials do not come about by themselves, but require training, guidelines for data compilation and metadata. It is also

necessary to have shared, centralised storage facilities. For the time being, there is just one such facility in the field of cultural and social research, i.e. the Finnish Social Science Data Archive. The Academy recommends that all research data are stored within this archive. There is an obvious need for similar archives for humanities data

Launched in 2004 and coordinated by the Academy the ERA-NET NORFACE network in the social sciences was wound up. The network involved 15 countries. In 2009 it issued funding decisions on a research programme with the theme Migration in Europe. The programme has a budget of 29 million euros, which makes it the biggest European research programme to date in the social sciences field.

*In 2009, the Research Council for Culture and Society awarded 69.6 million euros in research funding. The Council covers the following disciplines:*

- philosophy
- theology
- history and archaeology
- cultural studies
- arts research
- philology and linguistics
- law
- psychology
- logopedics
- education
- social sciences
- economics
- political science
- mass communication and library science



## RESEARCH COUNCIL FOR NATURAL SCIENCES AND ENGINEERING 2009:

### *Reviews provide support for strategic and operational planning*

Preparations ahead of the 2009 review of the current state of scientific research in Finland and the recommendations coming out of the workshops held in connection with the review had a major influence on the work of the Research Council for Natural Sciences and Engineering during the last year of its term. Among the proposed measures, the Council gave special prominence to the position of scientific research, research infrastructures and the development of the research career and school education. Furthermore, in response to the recommendations made, the Research Council undertook a discipline assessment in the field of chemistry together with Tekes, the Finnish Funding Agency for Technology and Innovation, and the chemical industry.

One of the recommendations of the 2009 review of the state and quality of scientific research in Finland concerned the postdoctoral research career. The Research Council supported younger researchers in gaining qualifications by granting 22 million euros for 20 five-year Academy Research Fellowships and 47 three-year Postdoctoral Researcher positions. In addition, 36.8 million euros was awarded in support of research projects. Approximately half of this sum went to projects in which the principal investigator was aged 45 or under. The proportion of younger researchers among funding recipients has been on the increase in recent years, and the good reviews they have received is an encouraging sign of the capacity for renewal among researchers today.

The Research Council provided support for the internationalisation of young researchers through all its funding instruments with a view to raising the standards of research through international cooperation. It also awarded funding for the mobility of doctoral-level researchers between industry and Finnish universities. In all, dedicated mobility funding from the Research Council amounted to 1.7 million euros.

*Infrastructure has prominent role.* The Research Council continued to pursue its long-term infrastructure policy by supporting research that has connections with major international science projects, programmes and organisations. Funding granted by the Research Council totalled around 4.6 million euros. Among the projects funded by the Council were those associated with the European Organization for Nuclear Research (CERN), the European Space Agency (ESA), the International Continental Scientific Drilling Program (ICDP) and the European Incoherent Scatter Scientific Association (EISCAT).

The Research Council's principal infrastructure policy decisions concerned the ICDP programme, the Nordic Optical Telescope (NOT) and the Mittag-Leffler Institute. Finland's membership of the ICDP was up for renewal, and the Research Council therefore commissioned a national report on the impact of Finland's contribution to the programme. The report showed that Finnish researchers had participated very actively in the ICDP and had had excellent success in the competition for Academy funding. The amount of funds returning to Finland via the ICDP programme is more or less equivalent to the sums paid out in membership fees. The Research Council decided in favour of an extension to Finland's membership of the programme in 2010–2014.

The Research Council continued to support the NOT through the payment of an additional membership fee. NOT continues to play an important role in researcher training. Access to use the telescope gives Finnish astronomers the experience they will need to succeed in the competition for observation time with the European Southern Observatory (ESO) very large telescopes.

Based in Sweden and funded from various Nordic sources, the Mittag-Leffler Institute for mathematics has in recent years been struggling financially. Working closely with its Nordic sister organisations, the Research Council is keen to strengthen Nordic research collaboration and is preparing to increase its contribution to the Institute's scientific programmes.

*Special investment in engineering research.* The Research Council's major policy decisions were informed by the recommendations based on the discipline assessments commissioned by the Research Council in 2006–2008 in the fields of energy technology, computer science research and mechanical engineering. In 2009, the Council's specific goal was to mobilise researchers in the mechanical and water engineering fields. In response to the recommendations of the mechanical engineering discipline assessment, the Research Council agreed with Tekes on a series of measures aimed at raising the quality of long-term research. By earmarking 3.1 million euros for a dedicated call in the field of mechanical engineering, the Research Council also wanted to support the Finnish Metals and Engineering Competence Cluster through the new knowledge and skills generated in research projects. In the water engineering field, the aim was to support the attainment of the objectives of the Finnish Water Programme, again working closely with



Tekes. The Research Council allocated a total of 1.8 million euros to water engineering research.

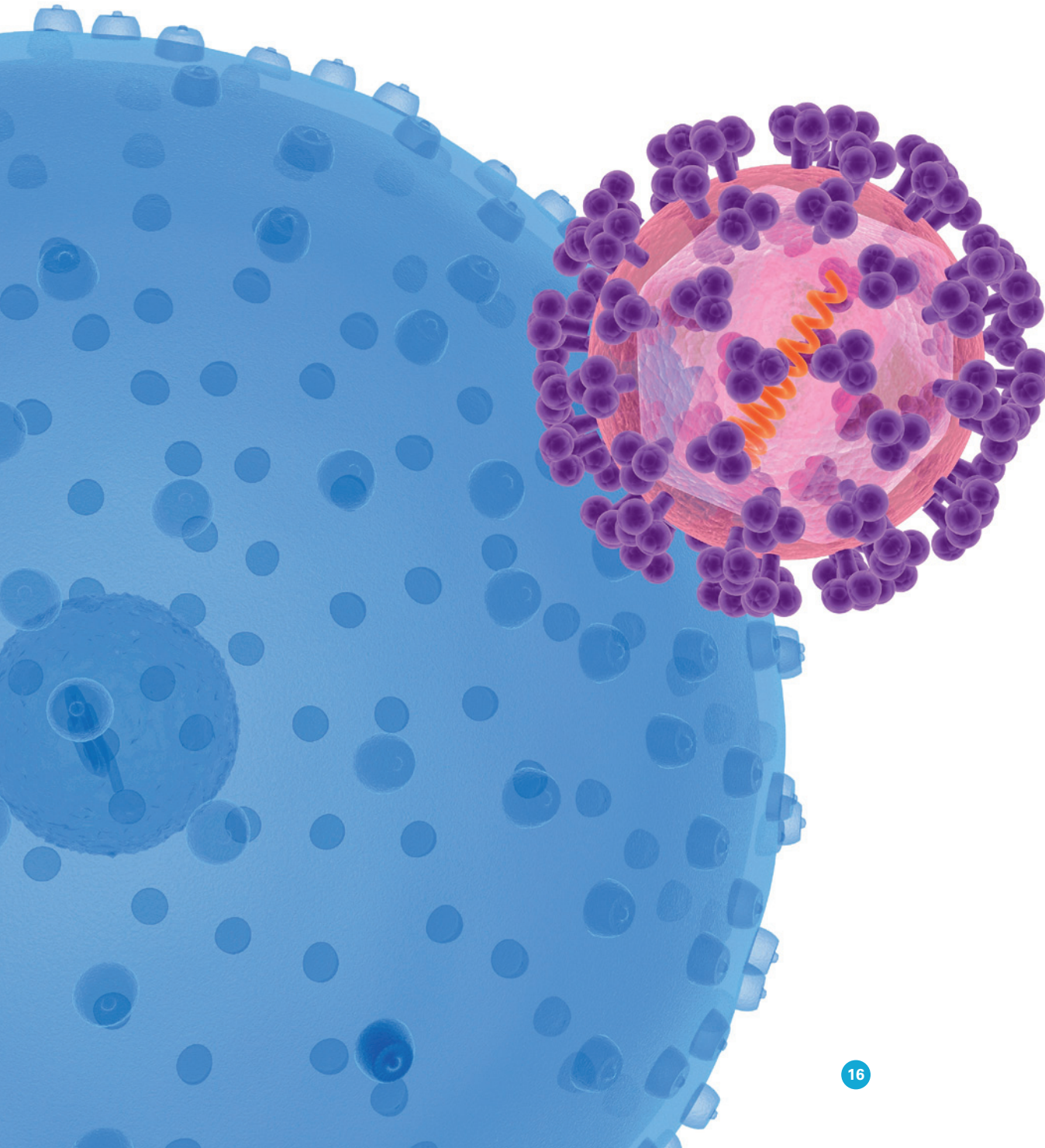
The Research Council's main areas of focus have included electronics, electrical engineering and computer sciences, all of which support the information industry. In the past three years, the proportion of electrical engineering and electronics projects receiving funding has increased from 16 to 25 per cent. In 2009, the Research Council decided on the allocation of funding to research in energy efficiency.

*Research has wide-ranging impact in society.* Research in natural sciences and engineering fields contributes significantly to the growth of skills and new knowledge within the scientific community and society at large. Research in these fields plays a critical role in addressing global environmental issues, in combating climate change, in facilitating the sustainable use of natural resources and in developing future energy solutions. Research results also allow for more informed political decision-making.

According to research reports for 2009, projects receiving general research grants in natural sciences and engineering fields produced on average 2.1 doctoral degrees, 0.1 licentiate's degrees and 1.8 master's degrees per one million euros of Academy funding. These same projects published on average 35 articles in scientific journals and 22 articles in edited scientific volumes or conference proceedings per one million euros. The number of articles published relative to the amount of funding was highest in space sciences and astronomy, physics and computer sciences. The number of patent applications filed and invention disclosures was highest in chemistry and geosciences.

*In 2009, the Research Council for Natural Sciences and Engineering awarded 102.6 million euros in research funding. The Council covers the following disciplines:*

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



RESEARCH COUNCIL FOR HEALTH 2009:  
*Seeking solutions to the challenges faced by  
clinical medicine*

The Research Council for Health partnered with the Swedish Research Council to conduct a review of the field of clinical medicine. The simultaneous assessment across two countries and using the same panel of reviewers was a first of its kind. There were strong hopes that the report, which was published in June 2009, would help to identify solutions to the problems faced by clinical medicine in both countries.

The evaluation included five Finnish and six Swedish medical faculties as well as the university hospitals attached to these faculties. It was conducted by a panel of 15 international experts. The material consisted of a bibliometric background report compiled by the Swedish Research Council on Finnish and Swedish medical publications. In addition, data were collected on research environments, research strategies and researcher training at the faculties concerned. The panel made site visits to all the faculties where they met with faculty management and clinical researchers at different stages of their career.

The panel's study showed a high international level of clinical research in both Finland and Sweden. The quality of this research is above world average, and some of the largest units are close to the world leaders. Even though there are many differences between the two countries in clinical research and health care, the panel also noted a surprising number of similarities.

The panel observed that the appeal of a clinical research career has been eroded. In practice the job is no longer financially competitive. Furthermore, it has become increasingly difficult to reconcile academic



research and clinical practice. The toughening demands on efficiency in public health care, for example, are detracting from all activities that are not directly related to the delivery of patient care.

The clinical research career path should be improved to make it easier to combine academic research interests and clinical practice at all career stages. This will require additional funding. However, in recent years the level of EVO funding (a form of compensation by the Finnish Government for research activities at university hospitals), for example, has dropped to worrying levels. On the other hand, the injection of additional funds will not in itself be enough to revive the status of clinical research at university hospitals.

Steps are also needed to improve opportunities for mobility so that clinical researchers can more easily visit other universities and university hospitals both at home and abroad.

*Support for research careers.* The Research Council supported research careers by awarding grants to both Postdoctoral Researchers and Academy Research Fellows. A review of the recipients of funding for Postdoctoral Researcher's projects shows that there has been a sharp drop in the number of researchers with a medical background: while in 2007 medical doctors still accounted for 19 per cent of all recipients of funding for Postdoctoral Researcher's projects, in 2009 the figure was down to just 5 per cent.

Even before the international evaluation of clinical medicine the Research Council for Health had moved to support clinical research careers through a dedicated call in 2006. The purpose of these dedicated research grants is to give medical doctors who hold a doctorate degree the

opportunity to pursue their research interests while continuing in clinical practice, both during and after their specialist training. In 2006–2009, the Research Council received 121 applications for research grants to support clinical research careers, 50 of which were approved. The number of applications filed has dropped by 47 per cent since 2006. Given this sharp loss of interest it is important that the Research Council now moves to freshen up the appeal of this funding instrument.

*More than 200 applications.* The Research Council awarded a total of 42.7 million euros to 229 applications. The top three funding recipients – biomedicine, clinical medicine and public health – were the same as in many previous years. In 2009 they accounted for 78 per cent of all general research grants, Postdoctoral Researcher's projects and Academy Research Fellowships awarded.

The Research Council is involved in several national and international research programmes, including two new Academy research programmes that were launched in 2009: Responding to Public Health Challenges and Ubiquitous Computing and Diversity of Communication.

The Research Council's single biggest contribution to international cooperation was the sum of over 700,000 euros made available to the European ERA-NET Pathogenomics network call. In addition, the Research Council worked actively to promote cooperation between Finland and India: the joint call with the Department of Biotechnology (DBT) under the Indian Ministry of Science and Technology in the field of medical diagnostics secured funding for six joint projects.

*In 2009; the Research Council for Health awarded 53.2 million euros in research funding. The Council covers the following disciplines:*

- 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.



## OPERATING ENVIRONMENT

### *Government invests 1.9 billion euros in R&D*

Total R&D investment in the Government's 2009 Budget was 1.9 billion euros, up 102 million euros from the year before. R&D spending as a proportion of central government expenditure, excluding debt servicing costs, was 4.4 per cent. Public R&D expenditure as a proportion of GDP rose to 1.02 per cent.

Sectors under the Ministry of Education and the Ministry of Employment and the Economy received 82 per cent of total government R&D funding. R&D expenditure by the Ministry of Education increased by around 60 million to almost 840 million euros in 2009. The Academy of Finland comes under the administration of the Ministry of Education. Funding allocated through the Ministry of Employment and the Economy increased by 50 million euros, which benefited the other principal research funding body in Finland, i.e. Tekes, the Finnish Funding Agency for Technology and Innovation. R&D funding from Tekes increased to 575 million euros, or 30.3 per cent of total public research funding.

Competitive research funding from the Academy of Finland amounted to 309 million euros, or 16.3 per cent of public research funding.

*In 2009 total spending on research and product development in Finland came to 6.85 billion euros, compared to around 6.87 billion euros in 2008. The private business sector accounted for 5 billion euros, the higher education sector for 1.2 billion euros and the other public sector for almost 600 million euros. It is estimated that overall, R&D expenditure in 2009 remained at roughly the same level as in 2008.*

In 2009, R&D expenditure as a proportion of GDP notched up from 3.7 to 3.9 per cent. This was explained by the decline in GDP. This figure has long been the second highest among EU countries (after Sweden), and the only other country in the whole world with a higher percentage is Israel.

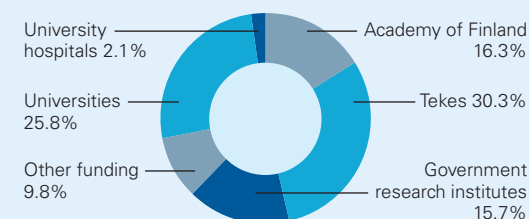
*Academy reviews the current state of scientific research.* Over the past 10 years, Finnish science and research and the research system have consistently ranked among the strongest OECD performers as measured by various indices, but the latest review by the Academy together with more than 400 experts indicates that there has been some loss of momentum.

The 2009 review of the state and quality of scientific research in Finland found that R&D investment as a proportion of GDP and business investment in R&D have remained at the same high level achieved in the early 2000s. Also on a positive note, cooperation between industry and academia is close and intense; and both the number of research personnel and the number of scientific publications per capita are high.

On the other hand, the reduced number of foreign visits by researchers and the declining number of scientific articles published give some cause for concern. It is particularly noteworthy that citation indices, a key measure of scientific impact and quality, are falling. When measured on this indicator, the quality of scientific research in Finland is no higher than in the OECD countries on average, and in a Nordic comparison Finland comes last by a wide margin.

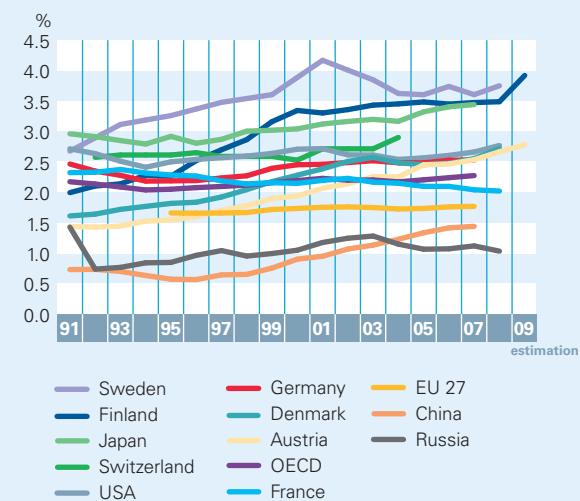
According to the Academy one possible reason for the current trends could lie in the emphasis that is now placed on applied research, both in research funding

Figure 2. Breakdown of central government R&D expenditure in 2009



Source: Statistics Finland, 2009

Figure 3. R&D expenditure in selected OECD countries and in China and Russia (R&D expenditure as a percentage of GDP)



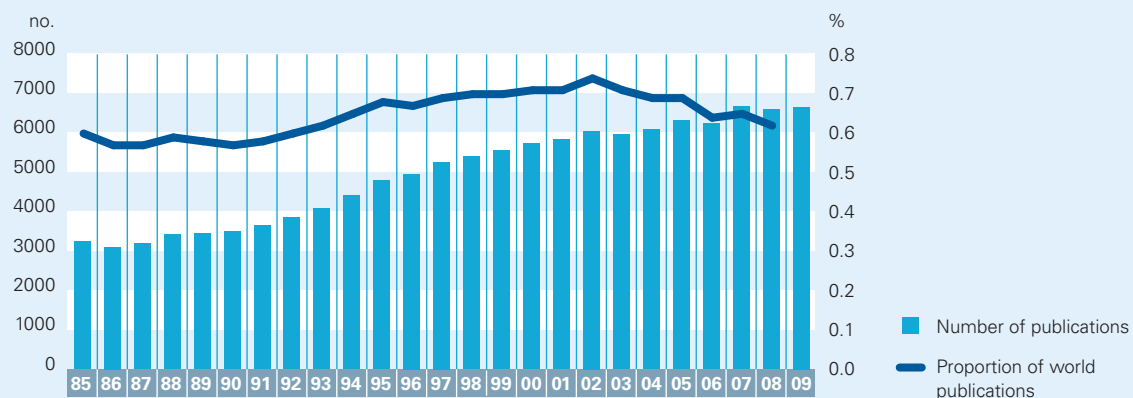
Sources: OECD Main Science and Technology Indicators, 2010 and Statistics Finland, 2010

Table 1. R&D expenditure by sector and as a percentage of GDP in 2002–2008 and estimate for 2009

Year	Private business sector****		Public sector***		Higher education sector		Total	R&D spending as % of GDP**
	€ million	%	€ million	%	€ million	%	€ million	%
2002	3,375.1	69.9	529.7	11.0	925.6	19.2	4,830.3	3.35
2003	3,527.9	70.5	515.4	10.3	961.7	19.2	5,005.0	3.43
2004	3,683.5	70.1	530.1	10.1	1,039.8	19.8	5,253.4	3.45
2005	3,876.9	70.8	554.7	10.1	1,042.1	19.0	5,473.8	3.48
2006	4,107.8	71.3	574.2	10.0	1,079.2	18.7	5,761.2	3.45
2007	4,513.4	72.3	564.7	9.0	1,164.6	18.7	6,242.7	3.47
2008	5,102.0	74.3	588.5	8.6	1,180.6	17.2	6,871.1	3.72
2009*	5,021.8	73.3	594.8	8.7	1,233.7	18.0	6,850.2	3.92

\* Estimate based on survey responses and other calculations  
 \*\* GDP 2006–2008 preliminary Statistics Finland data, GDP 2009 forecast by the Ministry of Finance  
 \*\*\* Including PNP (private non-profit sector)  
 \*\*\*\* More accurate reporting practices in the private business sector explain some 350 million euros of the increase from 2007 to 2008  
 Source: Research and development 2008, Statistics Finland 2009

Figure 4. Number of scientific publications from Finland and proportion of world publications in 1985–2008



Source: The State and Quality of Scientific Research in Finland 2009, Academy of Finland 2009

decisions and in science and technology policy debate. Universities engage disproportionately in applied research and development at the expense of basic research. The Government's principal policy documents have focused heavily on technological and economic issues and largely ignored scientific research. Other possible factors include the high proportion of doctoral students among research personnel, the erosion of research infrastructures, the low level of international engagement in science and research, and shortcomings in research funding principles and in scientific leadership.

The Academy has called for the development of a 10-year national science strategy. The 14 development proposals outlined in the review comprise the internationalisation of the Finnish research system, doctoral training and the research career, creative research environments and cooperation, research infrastructures and the role of science in society.

#### *Evaluation of the National Innovation System.*

The results of the evaluation conducted under the auspices of the Ministry of Employment and the Economy are largely in line with the Academy's findings. The evaluation concludes that the Finnish research and innovation system is in the midst of great upheavals and in need of fundamental reform. The new national innovation strategy, the university reform and many other changes in the research and funding system are driving our innovation and research policy in a new direction. Many science, research and innovation indicators suggest that Finland's international position has begun to weaken over the past decade or so.

## EVALUATION ACTIVITIES

### *Assessments of science and Academy-funded research*

The Academy continues to invest considerable effort in evaluating research and in developing evaluation methods with a view to improving its own operation and the quality and impact of Finnish research. Its evaluation activities include monitoring the state and quality of scientific research in Finland, assessments of individual disciplines and fields of research, and the review of funding applications. Some 90 per cent of all applications submitted to the Academy are reviewed by international experts. Research programmes and Centre of Excellence programmes are evaluated on their completion.

The single biggest evaluation project of 2009 concerned the current state of scientific research in Finland, which included an analysis of scientific research in Finland and the national research system in a European and global context; an assessment of the current state of science and research based on various indicators and comparisons; and the formulation of proposed future directions for scientific research and the national research system. The assessment of the state of scientific research was structured around the Academy's four Research Councils.

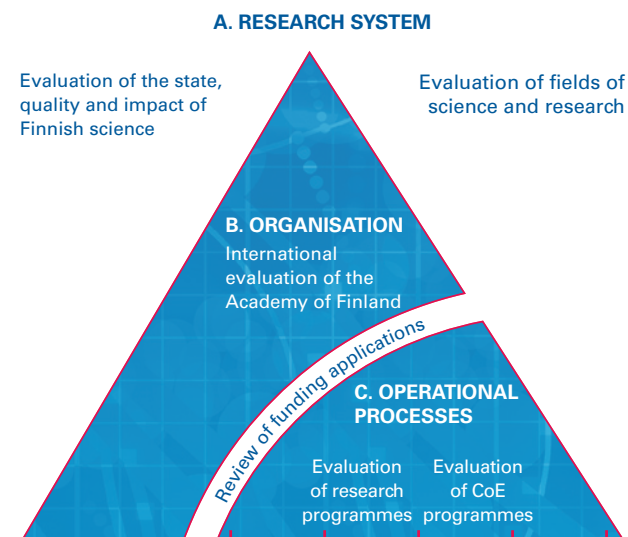
As part of this review the Academy also commissioned an assessment of the internationalisation of scientific research in Finland. In addition, the Academy continued to work closely with Tekes to explore and develop indicators for the measurement of various aspects of science.



From 1998 to 2009, the Academy has commissioned 35 assessments of individual disciplines and fields of research.

In 2009, the Academy published evaluations of the impact of water research and art research; an impact assessment of Centre of Excellence programmes; an evaluation of the field of clinical medicine conducted together with the Swedish Research Council; and final evaluations of three research programmes.

Figure 5: **Academy of Finland evaluation activities**





# ACADEMY FUNDING FOR RESEARCH

## *Research funding from the Academy continues to increase*

In 2009, the Academy awarded 304.2 million euros to support high-quality research and to promote researcher mobility and research careers, up from 287.2 million euros the year before.

The Academy's most important funding instruments were project funding, programme funding (research programmes and Centre of Excellence programmes), research posts (Academy Professors and Academy Research Fellows), Postdoctoral Researcher's projects and support to graduate schools.

The bulk of Academy funding, or 46 per cent, went to supporting research projects (Figure 6). Funding for research programmes accounted for 10 per cent, for researcher training 21 per cent and for researcher posts 15 per cent.

80 per cent of the Academy's funding was awarded to researchers working at universities (Figure 7). The breakdown by university is shown in Table 3 (page 23).

The Research Council for Natural Sciences and Engineering accounted for the largest share of Academy research funding (Figure 1).

The Academy received 4,391 funding applications to a total value of 1.6 billion euros: the figures in 2008 were 4,228 and 1.2 billion euros.

The number of applications received in any one year is linked with the number of research programmes and Centre of Excellence programmes open for application and with the allocation of research funding to different funding instruments.

The number of successful applications has declined from 2,510 in 2006 to 1,660 applications in 2009. The percentage of applications that were granted funding has remained almost unchanged.

The Academy monitors funding pressures on an ongoing basis. In the 2009 call for general research grants, for example, 22 per cent of applications were approved, and funds awarded amounted to 14 per cent of the total value of applications (Table 4).

The Academy awarded a total of 6.3 million euros for high-level research in 16 research projects in the fields of Strategic Centres for Science, Technology and Innovation. The Research Council for Natural Sciences and Engineering accounted for 70 per cent of this funding, or a total of 4.4 million euros.

In 2009, the Academy continued work to develop its research funding instruments.

Figure 6. Academy of Finland research funding decisions in 2009

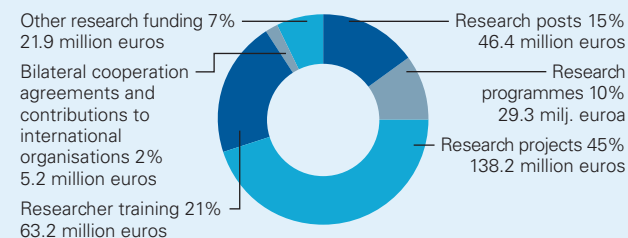


Figure 7. Academy of Finland research funding decisions by site of research in 2009

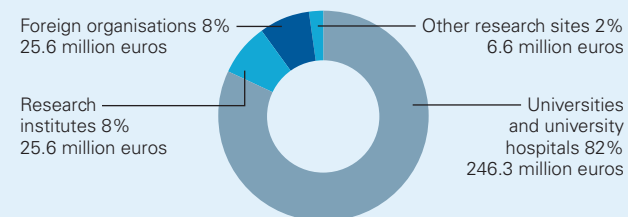


Figure 8. Development of Academy of Finland research funding 1995–2009

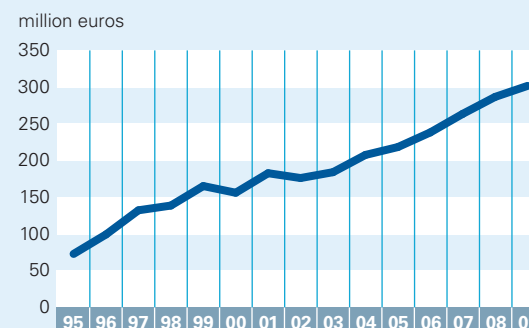


Table 2. Academy of Finland research funding decisions by discipline 2007–2009, €

Discipline	2007	2008	2009
<b>Natural sciences</b>	<b>102,818,690</b>	<b>120,381,740</b>	<b>134,871,800</b>
Space research and astronomy*	5,656,630	5,874,310	8,183,710
Biology, environmental sciences	37,136,330	43,414,480	43,957,130
Physics**	25,665,290	30,399,830	38,991,190
Chemistry	9,334,080	9,744,580	11,298,710
Mathematics	7,085,320	7,463,510	8,877,280
Information processing science	9,470,310	14,095,870	13,661,210
Geography	3,457,770	1,187,030	2,916,490
Geosciences, meteorology	5,012,960	8,202,130	6,986,080
<b>Engineering</b>	<b>30,679,052</b>	<b>30,352,490</b>	<b>31,848,750</b>
Architecture	202,000	165,000	115,230
Construction engineering, community planning and municipal engineering	1,410,300	778,560	2,490,680
Electrical engineering	15,396,170	13,537,060	13,515,590
Energy technology	1,499,150	0	664,000
Metallurgy and extractive engineering	557,080	7,290	404,370
Mechanical engineering	1,510,610	961,260	4,804,970
Process and materials technology	1,997,030	2,394,240	1,763,060
Chemical engineering and chemical process technology	3,278,290	3,204,330	2,977,400
Wood processing technology	176,960	1,094,120	144,520
Biotechnology and food engineering	3,824,792	2,334,080	3,106,170
Other engineering	826,670	5,876,550	1,862,760
<b>Medicine and health sciences</b>	<b>53,037,113</b>	<b>59,887,400</b>	<b>53,254,800</b>
Biomedicine	24,737,620	30,385,720	29,742,710
Clinical medicine	13,841,350	11,939,410	8,508,980
Nutrition science	736,960	1,734,990	1,462,590
Public health science	5,607,765	9,688,910	7,371,200
Dental science	275,280	2,510,710	1,855,960
Sports sciences	987,620	270,300	664,340
Pharmacy	3,658,498	3,177,070	2,151,010
Nursing science	10,000	136,900	394,600
Veterinary medicine	3,182,020	43,390	1,103,410

Discipline	2007	2008	2009
<b>Agriculture and forestry</b>	<b>6,916,840</b>	<b>6,160,260</b>	<b>7,880,310</b>
Agricultural sciences, food sciences	2,915,850	2,206,770	4,342,490
Forest sciences	4,000,990	3,953,490	3,537,820
<b>Social sciences</b>	<b>40,166,072</b>	<b>40,272,150</b>	<b>45,673,135</b>
Economics	3,037,160	2,436,200	2,953,040
Business economics, economic geography	5,365,460	5,144,460	5,706,680
Law	3,020,110	2,500,590	2,391,302
Social sciences	12,683,669	9,833,280	13,101,103
Psychology	4,799,550	6,325,400	5,280,800
Education	2,862,533	3,357,180	7,426,120
Political science and administration	6,318,600	6,134,820	4,820,410
Communication, library science and information science	1,699,550	4,525,020	3,737,690
Statistics	379,440	15,200	255,990
<b>Humanities</b>	<b>24,940,240</b>	<b>28,205,420</b>	<b>28,689,470</b>
Philosophy	2,793,190	4,146,200	4,937,280
History and archaeology	5,860,100	7,314,050	8,560,330
Philology and linguistics	5,192,080	8,934,320	6,464,430
Arts research and literature	5,752,390	4,166,420	3,010,460
Theology	4,039,970	1,978,460	1,599,920
Cultural studies	1,302,510	1,665,970	4,117,050
<b>Others***</b>	<b>5,471,370</b>	<b>1,930,000</b>	<b>1,940,000</b>
<b>Total</b>	<b>264,029,377</b>	<b>287,189,460</b>	<b>304,158,265</b>

\* The figures include the ESO annual membership dues (€2,196,000 in 2009)

\*\* The figures include the CERN membership dues (€11,324,320 in 2009)

\*\*\* To the Federation of Finnish Learned Societies for discretionary government transfers of learned societies (€920,000), for support to international scientific conferences and national scientific seminars (€820,000) and for scientific publishing (€200,000)

Table 3. Academy of Finland research funding decisions by site of research 2007–2009, €

Site of research	2007	%	2008	%	2009	%
<b>Universities</b>	<b>208,789,577</b>	<b>79.1</b>	<b>232,003,510</b>	<b>80.8</b>	<b>242,095,405</b>	<b>79.6</b>
Helsinki School of Economics	2,078,150	0.8	1,196,140	0.4	1,757,900	0.6
University of Helsinki	66,896,560	25.3	76,895,010	26.9	84,359,575	27.7
University of Joensuu	8,362,790	3.2	6,635,870	2.3	6,589,460	2.2
University of Jyväskylä	18,764,813	7.1	22,414,390	7.8	17,903,010	5.9
University of Kuopio	10,594,722	4.0	9,003,620	3.1	10,907,730	3.6
University of Lapland	967,090	0.4	797,640	0.3	1,235,600	0.4
Lappeenranta University of Technology	3,233,860	1.2	1,126,270	0.4	3,588,280	1.2
University of Oulu	15,653,840	5.9	21,561,530	7.5	19,483,810	6.4
Sibelius Academy	233,420	0.1	202,840	0.1	642,620	0.2
Hanken School of Economics	1,399,280	0.5	599,420	0.2	240,000	0.1
University of Art and Design Helsinki	491,000	0.2	1,834,200	0.6	378,500	0.1
Tampere University of Technology	6,854,920	2.6	9,432,290	3.3	9,559,250	3.1
University of Tampere	13,286,815	5.0	15,817,510	5.5	19,024,380	6.3
Theatre Academy	317,020	0.1				
<b>Site of research</b>	<b>2007</b>	<b>%</b>	<b>2008</b>	<b>%</b>	<b>2009</b>	<b>%</b>
Helsinki University of Technology	21,544,290	8.2	27,689,810	9.6	30,138,660	9.9
Turku School of Economics	1,172,270	0.4	907,010	0.3	2,789,940	0.9
University of Turku	27,410,300	10.4	22,764,910	7.9	26,043,250	8.6
University of Vaasa	891,880	0.3	797,190	0.3	207,120	0.1
Åbo Akademi University	8,636,557	3.3	12,327,860	4.3	7,246,320	2.4
<b>University hospitals</b>	<b>2,661,050</b>	<b>1.0</b>	<b>898,780</b>	<b>0.3</b>	<b>4,213,110</b>	<b>1.4</b>
<b>Research institutes</b>	<b>19,952,430</b>	<b>7.6</b>	<b>26,670,420</b>	<b>9.3</b>	<b>25,602,760</b>	<b>8.4</b>
<b>Foreign organisations</b>	<b>23,125,860</b>	<b>8.8</b>	<b>19,874,930</b>	<b>6.9</b>	<b>25,598,010</b>	<b>8.4</b>
<b>Registered associations/ Scientific societies</b>	<b>1,762,390</b>	<b>0.7</b>	<b>2,490,070</b>	<b>0.9</b>	<b>2,252,500</b>	<b>0.7</b>
<b>Polytechnics</b>	<b>385,900</b>	<b>0.1</b>	<b>664,740</b>	<b>0.2</b>	<b>36,000</b>	<b>0.0</b>
<b>Business companies</b>	<b>626,500</b>	<b>0.2</b>	<b>748,730</b>	<b>0.3</b>	<b>1,333,030</b>	<b>0.4</b>
<b>Other site of research</b>	<b>6,725,670</b>	<b>2.5</b>	<b>3,833,720</b>	<b>1.3</b>	<b>3,027,450</b>	<b>1.0</b>
<b>Individual researchers</b>			<b>4,560</b>	<b>0.0</b>		
<b>Total</b>	<b>264,029,377</b>	<b>100.0</b>	<b>287,189,460</b>	<b>100.0</b>	<b>304,158,265</b>	<b>100.0</b>

Table 4. Success rate of applications submitted for general research grants 2005–2009

Research Council	2005		2006		2007		2008		2009	
	Of applications		Of funding applied		Of applications		Of funding applied		Of applications	
	no.	%	no.	%	no.	%	no.	%	no.	%
Research Council for Biosciences and Environment	29	12	40	15	69	26	61	26	42	20
Research Council for Culture and Society	47	17	64	22	66	23	73	25	59	21
Research Council for Natural Sciences and Engineering	82	18	119	25	122	27	133	31	97	20
Research Council for Health	38	22	46	23	70	32	59	31	49	28
<b>Total</b>	<b>196</b>	<b>17</b>	<b>269</b>	<b>22</b>	<b>327</b>	<b>27</b>	<b>326</b>	<b>28</b>	<b>247</b>	<b>22</b>



## RESEARCH PROGRAMMES

### *Academy research programmes have significant impact*

The Academy of Finland opened several international calls for research programmes and hosted a number of related seminars. The Academy's research programmes also engaged in active dialogue with the surrounding society. They enjoyed high visibility both nationally and internationally.

The Academy had 13 ongoing research programmes (for a full list, see page 32). It invited applications for three new research programmes, conducted reviews of applications received and issued decisions on the research projects to be funded. Final evaluations were published on three research programmes.

The Academy continued to work closely with other research funding agencies. Ten national funding bodies contributed to Academy research programmes in 2009. Funding was also obtained from private business companies. The Academy's research programmes provided a framework for the international networking of research and for cooperation with funding organisations from 14 other countries.

*Research programmes* support the attainment of the science policy objectives set out in the Academy's research programme strategy. Focusing on selected thematic areas, their aim is to reform and strengthen research within those fields. Furthermore, they are designed to address society's long-term needs. The added value of research programmes comes from the collaboration and exchange between scientists and researchers working in different disciplines, the end-users of research results and research funding bodies.

The general public was kept informed about the progress of research programmes through seminars,

fairs, science breakfasts and the media. The researchers involved in the programmes contributed actively to public debate on various subjects.

In 2009, preparations were started for two new Academy research programmes, both of which organised an exploratory workshop in June. The purpose was to give researchers in the field an opportunity to contribute to the preparations and to comment on the proposed themes and the planning process more generally. The exploratory workshops for the Research Programme on Climate Change and for the Future of Living research programme attracted a strong attendance of 140 and 120 participants, respectively.

The Academy Board took the decision to launch preparations for two new research programmes: Programmable Materials and the Sustainable Management of Aquatic Natural Resources.

Funding was earmarked for three new programmes: Photonics and Modern Imaging Techniques; Computational Science – models and applications from social to natural sciences; and the Health and Welfare of Children and Young People.

*The Photonics and Modern Imaging Techniques* research programme opened three calls for research grants: the two-stage call for national projects in the spring and in October the joint international calls with Brazil's National Council for Scientific and Technological Development (CNPq) and with the Russian Foundation for Basic Research (RFBR).

*The Computational Science Research Programme* (LASTU) announced its first calls. Seven research consortia were selected for funding. Together, they were

awarded 8.6 million euros. In addition, the Finnish partners to the ERA-NET for systems biology, ERA-SysBio, were taken under the programme's umbrella and awarded 900,000 euros. The programme's projects are wide-ranging and multidisciplinary. As well as working on the development of computational methods, they also address current problems in various fields of application, such as brain research, fusion energy research and linguistics.

*The first call of proposals for the Health and Welfare of Children and Young People* (SKIDI-KIDS) research programme prompted 135 letters of intent; 57 of these applicants were shortlisted and requested to submit full applications. A mini seminar was held for all Finnish-Canadian consortia involved in the second stage of the calls with a view to strengthening research cooperation. Eight consortia and eight research projects were awarded a total of 8.5 million euros. In addition, the Ministry of Education undertook to finance a ninth consortium. Two of the consortia funded involve researchers from Canada.

*The Future of Work and Well-being* (WORK) research programme joined forces with the Rehabilitation and Research Centre Verve to organise a seminar in Oulu that attracted an attendance of over 100 people.

*In the Ubiquitous Computing and Diversity of Communication* (MOTIVE) research programme the funding period started.

*The Responding to Public Health Challenge* (SALVE) research programme themes gained extensive visibility in the mass media.

*The Substance Use and Addictions* research programme partnered with the A-Clinic Foundation to host an information seminar for media professionals and psychosocial service providers' PR and communications officers. The seminar discussed a diverse range of issues relating to alcohol, drugs and gambling, including various cultures of substance use, the relationship of the arts and science to culture, young people's and families' cultures of substance use, substance abuse subcultures, the cultures of substance abuse treatment systems, politics and drugs, and addictions in the media.

*During preparations for the Future of Living* (ASU-LIVE) research programme a round table meeting was held with experts in the field. In addition, an exploratory workshop was held that was attended by 117 researchers. The research programme is structured around three main themes – life spans, spaces and society – in which it is expected to produce significant research results. The programme will be arranging a joint call with the Japan Society for the Promotion of Science.

*The Research Programme on Climate Change* (FICCA) was given the go-ahead in November by the Academy Board. The Board earmarked 12 million euros for the four-year programme in 2011–2014.

*The final report of the Environment and Law* research programme (2005–2008) was published. The evaluation panel concluded that the research themes covered in the programme were highly challenging and of great current interest. The greatest strength of the

programme was its genuine interdisciplinarity, a goal that was approached in an innovative and exemplary way. The panel concluded that the programme had been particularly successful in establishing a highly visible and interactive programme community. Furthermore, it pointed out that the law and environment research field needs further support to improve its conceptual and thematic integrity and to develop a stronger common identity.

*The evaluation report of the Russia in Flux* research programme (2004–2007) concluded that Finnish research on Russia is among the very best in Europe. The evaluation panel gave high praise for the programme's international dimension, the active involvement of Russian researchers and the efforts made to communicate the research results to the wider public. Another point of praise concerned the thematic extent of the programme. Articles by the programme's researchers were collected into a volume entitled *Witnessing Change in Russia*.

*The Systems Biology and Bioinformatics* research programme (SYSBIO 2004–2007) was judged as a success in terms of both its scientific quality and value added. Finland has given high priority to the systems biology approach in natural science research, which has attracted a number of high-level computational science and mathematics research teams into this field. However, the evaluation panel took the view that Finland does not yet have the critical mass necessary to secure research in systems biology, and therefore stressed the importance of continued infrastructure development, researcher training and adequate research funding.



## CENTRES OF EXCELLENCE

### *Finnish Centre of Excellence programmes are a great success*

The Academy had two ongoing Finnish Centre of Excellence (CoE) programmes in which it provided funding to 41 CoEs: 23 CoEs in the 2006–2011 programme and 18 CoEs in the 2008–2013 programme. A full list of the CoEs is given on page 33.

The Academy published its impact assessment of the 2000–2005 and 2002–2007 Centre of Excellence programmes. According to this assessment the programmes are a great success. The most significant value added benefits have come through the development of environments for leading-edge research and researcher training. A change in attitudes is considered important because competition and above all success in the international competition is essential. Based on the results and recommendations of the evaluation the CoE strategy was reviewed and updated, and the decision was taken to announce a call in 2010 for a new CoE programme 2012–2017.

*Nordic Centre of Excellence programmes.* The Academy provided funding for all four ongoing Nordic Centre of Excellence (NCoE) programmes. Under the NCoE Food, Nutrition and Health programme (2007–2011), funding is provided for three units, one of which is coordinated from Finland and the two others of which involve Finnish research teams. Total programme funding amounts to around 11.5 million euros.

NCoE Welfare (2007–2011) involves two units, one of which is coordinated by Finnish partners, while the other involves Finnish research teams. Programme funding totals around 9.3 million euros.

In the NCoE Molecular Medicine programme (2004–2009, NOS-M), funding was provided for three units, one of which is coordinated by Finnish partners, while the two others involve Finnish teams. Total funding for the programme amounts to around six million euros.

In NCoE Humanities and Social Sciences (2005–2010, NOS-HS), funding was made available to four units, all of which involve Finnish researchers. Total programme funding comes to around 8.5 million euros.

The final evaluation of NCoE Global Change (2003–2007) was published. The programme was considered to have achieved its goals. Cooperation among Nordic funding agencies in a thematically defined research field generally proved to work well. The Secretariat for global change research was based at the Academy of Finland. Other aspects of the programme and its coordination were the responsibility of NordForsk. The Nordic Centres of Excellence are listed on page 33.

## INTERNATIONAL ACTIVITIES

### *Emphasis on active European cooperation*

The European Research Area (ERA) is developing vigorously. The Lisbon Treaty has for the first time provided a legal foundation for scientific research. An important shift in emphasis is the formulation in the Treaty that underpins the commitment to strengthen the EU's scientific and technological foundations.

The principles of Joint Programming were adopted in European research policy as a significant new approach to tackling major common challenges faced in society.

The EU Competitiveness Council lent its support to the initiative for the launch of Joint Programming focused on neurodegenerative diseases and to the Member States' proposal for the preparation of three new initiatives. These initiatives concern agriculture, food supply and climate change; a healthy diet; and cultural heritage. The Academy has been actively involved in drafting these initiatives and in developing best practice solutions.

The Academy organised an ERC seminar as well as two seminars on the foundations of the ERA and the ERAB document, which outlines a vision for the ERA in 2030.

The Academy had national responsibility for two specific programmes and six sub-programmes under the EU's 7th Framework Programme for Research:

- Cooperation: Health; Environment and climate change; Socio-economic sciences and humanities
- Ideas: European Research Council (ERC)
- People: Marie Curie
- Capacities: Research infrastructures; Science in society; and International cooperation.



The Academy continued to contribute to the work of ERA-NET, INCO-NET, NORIA-net and ESFRI (European Strategy Forum on Research Infrastructures).

*ERA-NETs.* Continued progress was made in upgrading ERA-NETs into European research programmes. ERA-NETs work in different fields of research and have different objectives and ways of working. They continued to pursue their original goal of promoting cooperation among national research programmes and, by the same token, researcher networking. In the future, ERA-NETs will provide a basis for or be incorporated as part of Joint Programming.

The Academy coordinated one and was a partner in 14 ERA-NET networks (see page 34). The networks announced several calls for research project proposals and applied to the Commission for further funding either as new ERA-NET projects or in order to open ERA-NET Plus calls.

The Academy participated in two European research programme calls in connection with ERA-NET networks: ELSA-GEN and PRIOMEDCHILD.

All ERA-NETs have announced joint calls for proposals. The Academy has awarded around 16 million euros in research funding to Finnish research teams involved in consortia funded through calls in 2007–2009.

New ERA-NET networks were established. The Academy took part in drafting five applications, three of which were follow-ups to existing ERA-NETs (CO-REACH, Circle2 and NORFACE II), while two concerned the creation of new networks (ERA-NET on Genomics and Genetic Epidemiology of Multifactorial Disease, GenERA; and ERA-NET on Water Research and Water Management, watERAnet). All projects are

aimed at launching jointly funded European research programmes. Furthermore, international ERA-NETs help to network EU Member States with research funding bodies outside Europe.

The European Commission approved the proposal for a Joint Baltic Sea Research Programme (BONUS 169). The BONUS 169 initiative has subsequently been passed on to the European Parliament and European Council. Budgeted at 100 million euros, the programme provides a broad research framework for the EU Member States in the Baltic Sea Area. The aim is to increase the research capacity around the Baltic Sea rim and ultimately to secure sustainable development. The Commission proposes to contribute 50 million euros to the common pot, with the rest to come from the EU Member States surrounding the Baltic Sea: Finland, Sweden, Denmark, Estonia, Germany, Latvia, Lithuania and Poland. BONUS 169 will coordinate national research programmes and other measures in the Baltic Sea region under the umbrella of one research programme in which the primary focus is on environment research. BONUS 169 follows on from BONUS ERA-NET and the BONUS+ project, which were both coordinated by the Academy.

The second funding term started for the Tekes-coordinated WoodWisdom-Net (2009–2012), a network aimed at deepening research collaboration in the field of wood material science.

The Academy participates in the ERA-AGE network, now in its second ERA-NET term (2009–2012), and in the European FUTURAGE project. The ERA-AGE is a network of research funding agencies that supports both research projects on ageing and promising young researchers. The aim of FUTURAGE is to

produce a roadmap for ageing research for the next 10–15 years. These projects are coordinated from the University of Sheffield in the UK. The Academy is involved in both of them.

Designed to promote research cooperation in the field of systems biology, the ERASysBio network announced an ERA-NET Plus call. Finnish scientists had notable success with their applications. ERASysBio has points of contact with the Academy's Computational Science Research Programme.

The Academy was in charge of practical arrangements for the calls announced in two ERA-NETs, even though it does not have responsibility for the coordination of these networks. In the Matera ERA-NET Plus call the Academy was responsible for the review process, and in the ERA-NET Neuron call for general arrangement.

*European Science Foundation (ESF).* The Academy contributed to the ESF through European science policy, research funding cooperation and actual research funding. It was also actively involved in various ESF Member Organisation fora, which provide a platform for discussion of current and important science policy and science administration issues at European level and for the development of best practice solutions.

The Academy decided to join four new ESF MO fora, which are Research infrastructures; Science in society relationships; Evaluation of publicly funded research; and Indicators of internationalisation. The Academy has previously contributed to five fora. The ESF MO fora are listed on page 34.

The Academy appointed its representative to the ESF's RESCUE (Responses to Environmental and

Societal Challenges for our Unstable Earth) foresight project and contributed to the reform and planning of the ESF's EUROCORES research programmes, timetables and applications procedures.

Each year the Academy's Research Councils provide some two million euros in funding to support Finnish research teams involved in successful EUROCORES consortia. In addition, the Research Councils contribute to the funding of some 40 ESF Research Networking programmes.

*European Research Council (ERC).* Projects that will be based in Finland or conducted in other countries by Finnish researchers were highly successful in ERC calls. Finland was the second most successful Nordic country in the ERC Starting Grants call: no less than six Finnish research projects were approved for funding. Five of these applicants have previously enjoyed success in securing competitive research funding and research posts through the Academy.

The Academy allocated funding to those researchers who received positive reviews in ERC calls but who were put on a reserve list. The aim of this funding is to enhance the applicants' and their projects' international competitiveness.

*Nordic cooperation.* The Academy contributed to funding NordForsk and to planning and conducting its work. It was also involved in promoting the joint Nordic top-level research and innovation initiative in the fields of climate, energy and environment. The joint initiative was based on a statement issued by the Nordic Council of Ministers. The budget for the initiative is around 40 million euros over a period of five years.

The first calls were announced under the initiative in the fields of interaction between climate change and the cryosphere; effect studies and adaptation to climate change; and energy efficiency with nanotechnology.

The Academy's Research Councils contributed to the work of Joint Committees of the Nordic Research Councils (Nordiska samarbetsnämnden, NOS). The Joint Committee of the Nordic Medical Research Councils (NOS-M) announced a call on the theme of neurosciences and metabolic and nutritional disorders. Funding was awarded to two joint Nordic seminars, one of which was held in Finland.

The Joint Committee for Nordic Research Councils for the Humanities and Social Sciences (NOS-HS) selected for funding ten Nordic NORDCORPS projects. Each project will receive 500,000–600,000 euros over their four-year term. Seven of these projects involve Finnish researchers. In two of them the principal investigator is Finnish. NOS-HS also announced an Exploratory Workshops call in which a total of 400,000 euros was awarded to 13 joint Nordic workshops. Finnish researchers were involved in ten of these workshops, and in five they were the project's principal investigator. Furthermore, NOS-HS contributed to funding four Nordic Centres of Excellence.

Working under the auspices of NOS-HS, the Nordic Board for Periodicals in the Humanities and Social Sciences (NOP-HS) provided funding for 30 joint Nordic publications.

The Academy was involved in organising and hosting various events held in connection with the Swedish-Finnish bicentennial, in cooperation with Swedish research funding agencies, as well as in the Swedish-Finnish Future Conference in Stockholm.

NORIA-nets, joint projects among Nordic research funding agencies launched by NordForsk, continued with their work. The Academy coordinated two networks and was otherwise involved in a further four (see page 34). The networks have been highly effective, and the benefits of funding cooperation have had immediate impact: the Academy's latest review of the state and quality of scientific research, for instance, was able to benefit directly from the cooperation under the Nordic Bibliometrics Network. The Peer Review NORIA-net led to one joint Nordic project review.

*Cooperation with India.* The Academy of Finland, the Department of Biotechnology (DBT) under the Indian Ministry of Science and Technology, and Tekes announced a call for joint project proposals in the field of medical diagnostics. The Academy and the DBT chose to finance five three-year projects under the call. Tekes and the DBT pledged funding for one project.

The Academy took part in India's biggest technology event as a member of a major science, research and business delegation from Finland, and attended the first follow-up meeting to the implementation of the science and technology agreement between the two countries.

The Academy signed joint guidelines with the Indian Department of Science and Technology (DST) regarding a joint call for proposals in 2010 in the field of green chemistry. The call was closed in January 2010 and is organised as part of the Academy's Research Programme on Sustainable Production and Products.

The Academy was charged with the coordination of Nordic-Asian research funding cooperation (Asia NORIA-net) and participated in the European New Indigo ERA-NET in an observer role.

*Cooperation with Japan.* Funding cooperation between Finland and Japan was intensified. The Academy received distinguished guests from each partner organisation: the Japan Society for the Promotion of Science (JSPS), the Japan Science and Technology Agency (JST) and the National Institute of Science and Technology Policy (NISTEP). The Academy reciprocated these visits. In June, the Academy attended the founding meeting of the JSPS Alumni Club in Turku.

The theme chosen for the bilateral call to be opened with the JSPS is the Future of Living. In addition, with the JST and Tekes, the Academy has agreed on three joint calls for project proposals in functional materials research in 2008–2010. The Academy hosted with the JST and Tekes a workshop in Helsinki on functional materials with a view to identifying Finland's and Japan's strengths in this field, to discuss the significance of funding cooperation to individual researchers and to promote the establishment of links between researchers from both countries. Based on the workshop the call was confined to research in photonics, optoelectronics, solar cell modules and batteries. At the same time it was incorporated as part of the Research Programme on Photonics and Modern Imaging Techniques.

The Academy reinforced its cooperation with the JST by participating in networking and training events organised for representatives of partner funding organisations in Tokyo and Kyoto.

In the Academy's January call, funding was granted to support the work of three Finnish researchers at Japanese universities and to cover the travel costs of 13 Finnish seminar speakers to Japan. In addition, grants were awarded to support the work of five Japanese researchers and the organisation of one Finnish-Japanese seminar in Finland.

The Academy has cooperation with the Finnish Institute in Japan and FinNode. The Academy has representation on the Institute's Delegation and Board.

*Cooperation with China.* The Academy partnered with the National Natural Science Foundation of China (NSFC) to organise a joint call for projects in the fields of signal processing and computational sciences. Funding was awarded to four Finnish-Chinese research projects. In addition, the Academy and the NSFC organised a joint energy seminar in Beijing.

The Academy worked with the Graduate University of Chinese Academy of Sciences (GUCAS) to organise a joint seminar for graduate schools in the natural science field; and with the Chinese Academy of Social Sciences (CASS) to organise a seminar in the field of comparative law. Both seminars were held in Beijing. Based on its agreements with the NSFC, CASS and the Chinese Academy of Sciences (CAS), the Academy awarded funding to support the work of 19 Chinese researchers in Finland and the work of 11 Finnish researchers in China. The Academy participated in the ERA-NET CO-REACH call through which the Academy supports one EU-China joint project.

*Latin America.* The Academy issued a joint call in connection with the Sustainable Energy research programme together with Brazil's National Council for Scientific and Technological Development (CNPq). With the Chilean National Commission for Scientific and Technological Research CONICYT, the Academy implemented a joint call in the field of education research. As part of the EULARINET INCO-Net, the Academy organised an Opening knots workshop for Latin American and

European research funding agencies and for business companies to enhance their cooperation.

Senior executives from the Academy, Tekes, VTT Finland and the Finnish Innovation Fund visited Chile and Brazil to further bolster this cooperation.

*North America.* The Academy continued to deepen its cooperation with the US National Science Foundation (NSF). It has offered US doctoral students contacts with Finnish graduate schools and with the Academy's Centres of Excellence and Academy Professor projects through the NSF's Graduate Research Fellows (GRF) programme. The aim is to try and encourage doctoral students in the GRF programme to spend a few months as exchange researchers in Finland. Furthermore, the Academy has embarked on talks with the US Department of Agriculture (USDA) to establish cooperation in the fields of nutrition and public health and agricultural research.

Cooperation with Canada has been stepped up particularly in the context of research programmes.

*Cooperation with Russia.* The Academy prepared several joint calls with Russian science funding agencies. The Academy and the Russian Foundation for the Humanities (RFH) issued a joint call on the theme of Finland's and Russia's shared history in 1809–2009. Two joint projects received almost one million euros in funding.

In October, a joint call related to the Research Programme on Photonics and Modern Imaging Techniques was implemented together with the Russian Foundation for Basic Research (RFBR). The Academy participated in the Europe INCONET EECA and ERA.Net.RUS projects as well as in the Finnish-Russian 1809 symposium for historians.



## ADVANCEMENT OF RESEARCH CAREERS

### *Academy investment in graduate schools stepped up*

The Academy announced its decisions on the ninth call for national graduate schools. It awarded 901 graduate school positions to 110 graduate schools, 19.8 million euros in operating grants and 80 graduate school co-ordinator person-years. The funding decisions were based primarily on the criteria of scientific quality and overall graduate school performance, PhD demand and placement, and the graduate school's international activities. This means that as from the beginning of 2010, there will be 112 graduate schools in Finland with a total of 1,600 graduate school positions funded by the Ministry of Education.

The Academy appointed a support group for the development of the graduate school system, with representatives from the Academy of Finland, the Ministry of Education, universities, graduate schools and business and industry. The support group is charged with preparing the next graduate school call, developing mechanisms for monitoring and evaluating the graduate school system, and drafting recommendations for the development of the system.

The support group familiarised itself with the US and Irish graduate school system. To explore the prospects for deepening international cooperation among graduate schools and to identify areas of thematic interest, a seminar was organised in Beijing between Finnish graduate schools and China's biggest graduate school.

The Academy undertook a major information tour to raise awareness about researcher training and research career issues. Special focus was given to the four-tiered research career model and to the role of Marie Curie

actions of the People specific programme under FP7 in promoting researcher mobility and internationalisation. The Academy is a member of the European researchers in motion website EURAXESS and therefore published a new national version of the website portal.

The Academy has representation on the EU Steering Group Human Resources and Mobility. It is also involved in the ESF Member Organisation Forum on Research Careers that is aimed at finding ways of promoting research careers through research funding. Furthermore, the Academy has contributed actively to the work of the European Network on Research Careers (ENRC), a body that consists mainly of research funding agencies.

*Fixed-term research posts* are among the Academy's most important funding instruments for supporting research careers. These positions have given researchers the independence they need to concentrate longer term on scientific work. The Academy had 280 posts for Academy Research Fellows and 41 posts for Academy Professors when in August 2009 the former number was increased by 13 posts and the latter by one. The research post system was reformed as from the beginning of 2010.

The Academy awarded 146 three-year grants for Postdoctoral Researcher's projects.

*FiDiPro programme a continued success.* The Finland Distinguished Professor (FiDiPro) funding programme, jointly administered by the Academy and Tekes, gives Finnish universities and research institutes the opportunity to hire highly qualified foreign researchers for fixed periods. In 2009, Academy funding was made available to 27 international FiDiPro researchers at different

universities and research institutes. The total volume of the funding programme was 19 million euros.

The Academy conducted an assessment of the significance and impact of FiDiPro funding in research organisations. Based on the results, it is clear that the funding programme has a major role in advancing the internationalisation of research organisations. FiDiPro professorships have clearly reinforced the areas of strength identified by universities, and for most organisations they have brought in additional funding. Support received from international funding organisations and for purposes of international engagement and exchange is particularly important from an internationalisation perspective. Significant sources of additional funding include FP7, the European Research Council, Nord-Forsk and the Nordic Council of Ministers.

The Academy's third FiDiPro call was opened. Decisions on the projects that will be supported under the programme will be made in summer 2010.

*Promoting women's research careers* and gender equality. The Academy is committed to promoting gender equality and preventing discrimination in all its activities. The gender balance in Academy research posts and research grants is becoming increasingly equitable. However, at the start of 2009 just 13 per cent of all Academy Professors were women, although that figure is set to rise to 22 per cent as from the beginning of 2010. The Academy's Research Councils have taken into account the needs of gender equality when submitting their shortlists of candidates to the Academy Board, which makes the final decisions on the appointment of Academy Professors.

## ACADEMY PERSONNEL

### *Academy of Finland has excellent employer image*

In 2009, the Academy's Administration Office had a staff of 164, of whom 73 per cent were women.

Ongoing changes in the operating environment are reflected in many ways in the daily work of all personnel. The reforms that are sweeping the university and research sector, the adoption of the full cost model, the central government productivity programme and the new Act on the Academy of Finland are changing practices in the workplace and creating new demands. Various changes in information systems and internal development projects resulted in the need to learn new skills and to develop workplace practices and procedures.

Implementation of the new personnel strategy was continued in close collaboration with employees. The aim of the strategy is to ensure employee well-being in the workplace and to provide an exciting and inspiring atmosphere in which to work. The Academy is committed to staff development. Management is fair and equitable. Key areas of development in the personnel strategy are staff competencies and human resources planning, well-being in the workplace as well as management and supervision.

Employee job satisfaction was measured for the first time using the VMBaro survey. The results for the Academy were consistently high and better than in comparative groups. Particular strengths for the Academy include ready access to support from immediate superiors, high levels of job autonomy and influence over job contents, opportunities for skills development and a positive climate of cooperation in the workplace.

High scores were also given to the Academy's public image as a good employer. The areas of development identified in the survey will be addressed.

*The Academy's commitment to developing staff competencies* was reflected in common training and personnel exchange schemes. In addition, to maintain and develop personal skills, Academy employees attended scientific conferences and other outside training.

Work was continued to develop the Administration Office's wage system. The aim is to make the system clearer, simpler and fairer and to increase its incentive effect. The Academy also developed flexible practices for changing life situations. Working hours guidelines were revised.

Furthermore, active efforts were continued to promote physical and mental well-being in the workplace. In view of future office facilities needs, a process was started in the Administration Office to survey the views of personnel as to what constitutes a good workplace.

Good management and a clear management system support staff well-being. The Academy also places great premium on the well-being of management. To this end and to ensure consistency of management, round table discussions were held for superiors on current personnel matters. Job supervision was also provided for superiors. An outside consultancy was commissioned to review the management system and organisation structure and to launch a development project.

The Academy's personnel is willing to assume responsibility for creating a stimulating atmosphere in the workplace and for ensuring their own as well as their colleagues' well-being at work. This is clearly reflected in their proactive and creative input in personnel issues.



# APPENDICES

## Board of the Academy of Finland

Professor Markku Mattila  
President of the Academy  
of Finland  
Chair of the Board

Professor Paavo Pelkonen  
Research Council for  
Biosciences and Environment  
University of Joensuu

Professor Eila Helander  
Research Council for Culture  
and Society  
University of Helsinki

Professor Erkki Oja  
Research Council for Natural  
Sciences and Engineering  
Helsinki University of  
Technology

Professor Kalervo Väänänen  
Research Council for Health  
University of Turku

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

Pirkko Nuolijärvi, Director  
Research Institute for the  
Languages in Finland

## Administration Office Management

Markku Mattila, President  
Riitta Mustonen,  
Vice President, Research  
Ossi Malmberg,  
Vice President, Administration

### Units and Unit Directors

Biosciences and  
Environment Research Unit  
Laura Raaska

Culture and Society  
Research Unit  
Pirjo Hiidenmaa

Natural Sciences and  
Engineering Research Unit  
Susan Linko

Health Research Unit  
Mikael Fogelholm

International Relations Unit  
Raija Hattula

Programme Unit  
Ritva Dammert

Administration Unit  
Maarit Saarela

Services Unit  
(until 1 Oct 2009)  
Seppo Hongisto

Finance Unit  
Mervi Taalas

Information  
Management Unit  
Marja Kylämä

Communications Unit  
Maj-Lis Tanner

Lists of Academy Professors,  
Academy Research Fellows,  
FiDiPro Professors and  
Academicians are available  
on the Academy's website at  
www.aka.fi/eng.

## Members of the Research Councils

### Research Council for Biosciences and Environment

#### Chair

Professor Paavo Pelkonen  
University of Joensuu

#### Members

Professor Jaana Bamford  
University of Jyväskylä

Adjunct Professor Marina Heinonen  
University of Helsinki

Professor Hely Häggman  
University of Oulu

Professor Jouni Häkli  
University of Tampere

Professor Jaakko Kangasjärvi  
University of Helsinki

Professor Juha Kämäri  
Finnish Environment Institute

Professor Reijo Lahti  
University of Turku

Adjunct Professor Jyrki Luukkanen  
Turku School of Economics

Professor Liselotte Sundström  
University of Helsinki

Professor Karl Åkerman  
University of Helsinki

### Research Council for Culture and Society

#### Chair

Professor Eila Helander  
University of Helsinki

#### Members

Professor Pertti Haapala  
University of Tampere

Research Director  
Päivi Hovi-Wasastjerna  
University of Art and  
Design Helsinki

Professor Anne Kovalainen  
Turku School of Economics

Professori Pauli Niemelä  
University of Kuopio

Professor Jaakko Pehkonen  
University of Jyväskylä

Professor Lea Rojola  
University of Turku

Professor Pekka Ruohotie  
University of Tampere

Professor Katariina Salmela-Aro  
University of Jyväskylä

Professor Marja Tuominen  
University of Lapland

Professor Jan-Ola Östman  
University of Helsinki

### Research Council for Natural Sciences and Engineering

#### Chair

Professor Erkki Oja  
Helsinki University of  
Technology

#### Members

Professor Helena Aksela  
University of Oulu

Professor Jaakko Astola  
Tampere University of  
Technology

Research Professor  
Johanna Buchert  
VTT Technical Research  
Centre of Finland

Professor Hannu Hänninen  
Helsinki University of  
Technology

Professor Timo Jääskeläinen  
University of Joensuu

Professor Pertti Mattila  
University of Helsinki

Professor Jarmo Partanen  
Lappeenranta University of  
Technology

Research Professor Tuija  
Pulkkinen  
Finnish Meteorological  
Institute

Professor Kaisa Sere  
Åbo Akademi University

Professor Pirjo Vainiotalo  
University of Joensuu

### Research Council for Health

#### Chair

Professor Kalervo Väänänen  
University of Turku

#### Members

Professor Anssi Auvinen  
University of Tampere

Professor Helena Gylling  
University of Kuopio

Professor  
Kirsti Husgafvel-Pursiainen  
Finnish Institute of  
Occupational Health

Professor Marja-Liisa Hänninen  
University of Helsinki

Professor Tatu Juvonen  
University of Oulu

Professor Jorma Keski-Oja  
University of Helsinki

Professor Mikael Knip  
University of Helsinki

Research Director  
Anna-Elina Lehesjoki  
University of Helsinki

Professor Tuula Salo  
University of Oulu

Professor Pia Vuorela  
Åbo Akademi University

## Academy research programmes

Business Know-how, LIIKE2  
(2006–2009)

Environment and Law,  
ENVLAW (2005–2009)

Future of Work and Well-being,  
WORK (2008–2011)

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

Nanoscience, FinNano  
(2006–2010)

Neuroscience, NEURO  
(2006–2009)

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

Power and Society in Finland,  
VALTA (2007–2010)

Responding to Public Health  
Challenges, SALVE  
(2009–2012)

Sustainable Energy, SusEn  
(2008–2011)

Sustainable Production and  
Products, KETJU (2006–2010)

Substance Use and Addictions,  
ADDIKTIO (2007–2010)

Ubiquitous Computing and  
Diversity of Communication,  
MOTIVE (2009–2012)



## *Finnish Centres of Excellence in Research*

### **Centres of Excellence 2006–2011**

Adaptive Informatics Research  
Helsinki University of  
Technology

Ancient Greek Written Sources  
University of Helsinki

Cancer Biology  
University of Helsinki

Complex Disease Genetics  
National Institute for  
Health and Welfare,  
University of Helsinki  
and Folkhälsan

Computational Complex  
Systems Research  
Helsinki University  
of Technology

Computational  
Molecular Science  
University of Helsinki

Computational Nanoscience  
Helsinki University  
of Technology

Evolutionary Genetics  
and Physiology  
University of Turku and  
University of Helsinki

Evolutionary Research  
University of Jyväskylä

Global Governance Research  
University of Helsinki

Inverse Problems Research  
University of Helsinki,  
University of Kuopio,  
Helsinki University  
of Technology,  
University of Oulu and  
Lappeenranta University  
of Technology

Learning and  
Motivation Research  
University of Jyväskylä

Low Temperature Quantum  
Phenomena and Devices  
Helsinki University  
of Technology and  
VTT Technical Research  
Centre of Finland

Metapopulation Research  
University of Helsinki

Nuclear and Accelerator  
Based Physics  
University Jyväskylä

Plant Signal Research  
University of Helsinki and  
University of Turku

Political Thought and  
Conceptual Change  
University of Jyväskylä

Process Chemistry  
Åbo Akademi University

Signal Processing  
Tampere University  
of Technology

Study of Variation, Contacts  
and Change in English  
University of Helsinki and  
University of Jyväskylä

Systems Neuroscience and  
Neuroimaging Research  
Helsinki University  
of Technology and  
University of Helsinki

Translational  
Genome-scale Biology  
VTT Technical Research  
Centre of Finland,  
University of Turku and  
University of Helsinki

Virus Research  
University of Helsinki

### **Centres of Excellence 2008–2013**

Algorithmic Data  
Analysis Research  
University of Helsinki and  
Helsinki University  
of Technology

Analysis and  
Dynamics Research  
University of Helsinki and  
University of Jyväskylä

Cardiovascular Diseases and  
Type 2 Diabetes Research  
University of Kuopio and  
University of Oulu

Foundations of European  
Law and Polity Research  
University of Helsinki,  
Åbo Akademi University and  
National Institute for Health  
and Welfare

Functional Materials  
Åbo Akademi University  
and University of Helsinki

Generic Intelligent  
Machines Research  
Helsinki University of  
Technology and Tampere  
University of Technology

Host Defence Research  
University of Turku,  
University of Helsinki and  
National Institute for Health  
and Welfare

Integrative Photosynthesis  
and Bioactive Compound  
Research at Systems  
Biology Level  
University of Turku and  
University of Helsinki

Interdisciplinary  
Music Research  
University of Jyväskylä  
and University of Helsinki

Microbial Food Safety  
Research  
University of Helsinki

Molecular and Integrative  
Neuroscience Research  
University of Helsinki

Molecular Imaging  
in Cardiovascular and  
Metabolic Research  
University of Turku,  
Åbo Akademi University and  
Turku University Hospital

Philosophical Psychology,  
Morality and Politics:  
Human Conduct in  
the History of Philosophy  
University of Helsinki and  
University of Jyväskylä

Physics, Chemistry,  
Biology and Meteorology  
of Atmospheric Composition  
and Climate Change  
University of Helsinki,  
University of Kuopio and  
Finnish Meteorological  
Institute

Public Choice Research  
University of Turku and  
Turku School of Economics

Research on Mitochondrial  
Disease and Ageing  
University of Tampere and  
University of Helsinki

Smart Radios and Wireless  
Research  
Helsinki University of  
Technology and Tampere  
University of Technology

White Biotechnology –  
Green Chemistry Research  
VTT Technical Research  
Centre of Finland

## *Nordic Centres of Excellence in Research*

### **Nordic Centres of Excellence on Molecular Medicine 2004–2009**

(NCoE Molecular Medicine)

Disease Genetics  
University of Helsinki

Neurodegeneration  
Lund University

Research in Water Imbalance  
Related Disorders  
University of Oslo

### **Nordic Centres of Excellence for the Humanities and Social Sciences 2005–2010**

(NCoE Humanities and  
Social Sciences)

Cognitive Control  
Umeå University

Empirical Labor Economics  
Uppsala University

NORMS –  
Microcomparative Syntax  
University of Tromsø

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

### **Nordic Centre of Excellence Programme on Food, Nutrition and Health 2007–2011**

(NCoE Food, Nutrition  
and Health)

HELGA: Nordic Health –  
Wholegrain Food  
Danish Cancer Society

MitoHealth: Centre  
for Bioactive Food  
Components and Prevention  
of Lifestyle Diseases  
University of Bergen

SYSDIET: Systems Biology  
in Controlled Dietary  
Interventions and  
Cohort Studies  
University of Kuopio

### **Nordic Centre of Excellence Programme on Welfare Research 2007–2012**

(NCoE Welfare)

Reassessing the Nordic  
Welfare Model  
Norwegian Institute  
for Research on Welfare  
and Aging

The Nordic Welfare State –  
Historical Foundations and  
Future Challenges  
University of Helsinki

## International cooperation

### ERA-NET projects

#### Coordinator

NORFACE, New Opportunities for Research Funding Co-operation in Europe – A Strategy for Social Sciences, 2004–2009

NORFACE+, New Opportunities for Research Funding Co-operation in Europe – A Strategy for Social Sciences, 2009–2014

#### Partner

BONUS+ and BONUS A169, BONUS for the Baltic Sea Science – Network Funding Agencies, 2008–2016

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

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

ERA-AGE 2, European Research Area in Ageing, 2009–2012

ERA-CHEMISTRY, Implementation of Joint Bottom-up European Programmes in Chemistry, 2004–2009

ERA-NET Neuron, Network of European Funding for Neuroscience Research, 2007–2010

ERA.Net.RUS, Linking Russia to the ERA: Coordination of MS/ AC S&T Programmes towards and with Russia, 2009–2011

ERA-PG, European Research Area and Plant Genomics, 2004–2009

ERASysBio and ERASysBio+, Towards a European Research Area for Systems Biology, 2006–2010

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

Matera and Matera+, Material Science and Engineering in Europe, 2005–2011

NanoSci-ERA and NanoSci-ERA+, NanoScience in the European Research Area, 2005–2010

Pathogenomics, Trans-European Cooperation and Coordination of Genome Sequencing Functional Genomics of Human-pathogenic Microorganisms, 2004–2012

WoodWisdom-Net2, Networking and Integration of National Programmes in the Area of Wood Material Science and Engineering in the Forest-based Value Chains, 2009–2012

### INCO-NET projects

EULARINET, European Union – Latin American Research and Innovation Networks, 2008–2012

INCO-NET EECA, Cooperation Network for Eastern and Central Asian Countries, 2008–2010

### Nordic NORIA-nets

#### Coordinator

Development of Peer Review in the Nordic Context, 2008–2009

Nordic-Asian Research Funding Cooperation, 2008–2009

#### Partner

The Nordic eScience Initiative, 2008–2009, Coordinator: Research Council of Norway

Nordic Network for International Research Policy Analysis 2009–2010, Coordinator: Swedish Research Council

Nordic Research Infrastructure Network, 2009–2010, Coordinator: Danish Agency of Science, Technology and Innovation

The Use of Bibliometrics in Research Policy and Evaluation Activities, 2008–2009, Coordinator: Swedish Research Council

### EUROCORES programmes in which the Academy of Finland has participated from 2001 onwards

Better Analyses Based on Endangered Languages, BABEL 2009–2012

Challenges of Biodiversity Science, EuroDIVERSITY 2006–2009

Climate Variability and the Carbon Cycle (Past, Present and Future), EuroCLIMATE 2005–2008

Cross-national and Multi-level Analysis of Human Values, Institutions and Behaviour, HumVIB 2009–2011

Development of a Stem Cell Tool Box, EuroSTELLS 2005–2008

Ecological and Evolutionary Functional Genomics, EuroEEFG 2010–2012

European Collaborative Research on Cooling in Acute Ischemic Stroke, EuroCOOLS 2010–2012

European Collaborative Research Projects, ECRP 2001–

European Comparisons in Regional Cohesion, Dynamics and Expressions, EuroCORECODE 2010–2012

Friction and Adhesion in Nanomechanical Systems, FANAS 2008–2011

Higher Education and Social Change, HESC 2009–2012

Histories from the North – Environments, Movements, Narratives, BOREAS 2006–2010

How Cells Shape and Utilize Their Membranes, EUROMEMBRANE 2009–2012

Inventing Europe (Technology and the Making of Europe, 1850 to the Present) 2007–2010

Logical Modelling in Interaction, Communication, Cognition and Computation, LogiCCC 2009–2011

Maximizing the Impact of Graphene Research in Science and Innovation, EuroGRAPHENE 2010–2012

The Origin of Man, Language and Languages 2002–2005

Pan-European Clinical Trials, ECT, EURAMOS 2005–2009  
Quantum Cold Matter, EuroQUAM 2007–2010

Science of Protein Production for Functional and Structural Analysis, EuroSCOPE 2006–2009

Self-organised Nanostructures, SONS 2003–2006

Smart Structural Systems Technologies, S3T 2006–2008

Stress and Mental Health, EuroSTRESS 2009–2011

Synthetic Biology: Engineering Complex Biological Systems, EuroSYNBIO 2010–2012

### EUROCORES programmes for which decision on participation made in 2009

Bio-inspired Engineering of Sensors, Actuators & Systems, EuroBioSAS

Ecology of Plant Volatiles, from Molecules to the Globe, EuroVOL

Functional Genomic Variation in the Epilepsies, EuroEPINOMICS

Molecular Science for a Conceptual Transition from Fossil to Solar Fuels, EuroSolarFuels

The Nature of Cyberbullying: Prevalence, Developmental Precursors, Longitudinal Course, and Prevention and Intervention Strategies, EuroCYNAT

Understanding and Misunderstanding: Cognition, Communication and Culture, EuroUnderstanding

### European Science Foundation (ESF) Member Organisation Fora

Evaluation: Indicators of Internationalisation

Evaluation of Funding Schemes and Research Programmes

Evaluation of Publicly Funded Research

Medium-Sized Research Infrastructures

Peer Review

Promoting Internationalisation of Social Sciences in Central and Eastern Europe

Research Careers

Research Integrity

Science in Society Relationships

### Captions:

Page 7: Sanna Sevanto measures changes in the diameter of a pine tree stem at the SMEAR II station as part of the research at the Centre of Excellence in Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change. (Photo: Martti Perämäki)

Page 8: Geoff Luck conducts research into music and movement at the Centre of Excellence in Interdisciplinary Music Research, at the University of Jyväskylä's Department of Music. (Photo: Petteri Kivimäki)

Page 9: Pasi Myllyperkiö works at the FUNANO consortium at the University of Jyväskylä, which forms part of Academy of Finland's Research Programme on Nanoscience. (Photo: Petri Blomqvist)

Page 10: Howard Jacobs of the University of Tampere Institute of Medical Technology (IMT), head of the Centre of Excellence in Research on Mitochondrial Disease and Ageing. (Photo: Jonne Renvall)

Page 20: The Academy of Finland Awards were presented to two researchers at the Academy's Science Gala in 2009. Academy Research Fellow and Adjunct Professor Miia Kivipelto of the University of Kuopio was given the award for social impact and Professor Otso Ovaskainen of the University of Helsinki was given the award for scientific courage. (Photo: Petri Asikainen, STT Info)

Published by the Academy of Finland, Helsinki 2010

Graphic design: SEK PRO

Translated by David Kivinen

Printed by Erweko

Electronic annual report: [www.aka.fi/publications](http://www.aka.fi/publications)

More information on the Academy of Finland: [www.aka.fi/eng](http://www.aka.fi/eng)

More information on the Finnish science and science policy:

[www.research.fi](http://www.research.fi) and [www.euraxess.fi](http://www.euraxess.fi)

ISBN: 978-951-715-779-7 (print), 978-951-715-780-3 (pdf)







Vilhonvuorenkatu 6 • POB 99, FI-00501 Helsinki, Finland  
Phone +358 9 774 881 • Fax +358 9 7748 8299 • [keskus@aka.fi](mailto:keskus@aka.fi) • [www.aka.fi/eng](http://www.aka.fi/eng)

