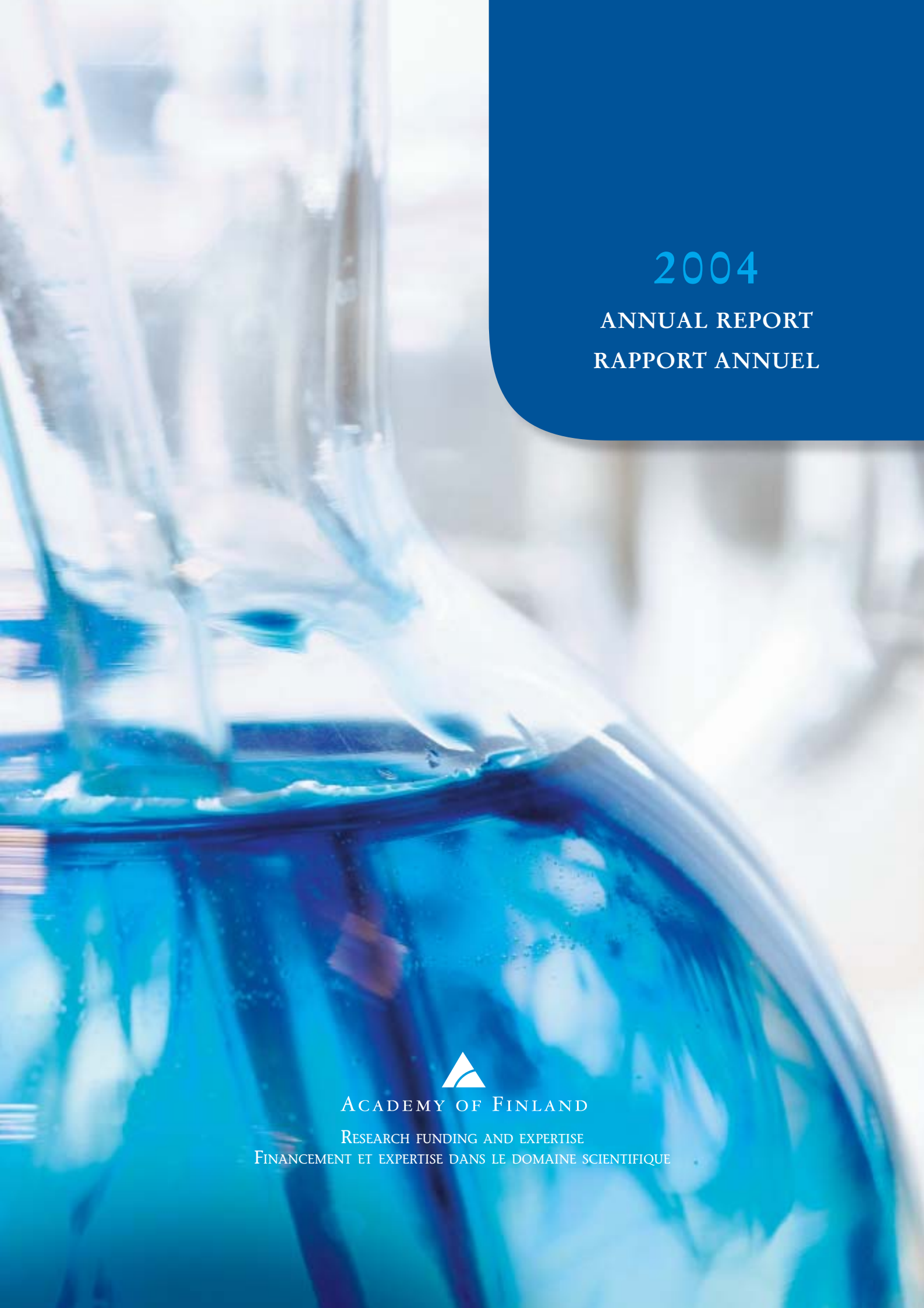

2004

ANNUAL REPORT
RAPPORT ANNUEL

ACADEMY OF FINLAND

RESEARCH FUNDING AND EXPERTISE
FINANCEMENT ET EXPERTISE DANS LE DOMAINE SCIENTIFIQUE

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Academy of Finland in brief

The Academy of Finland works to promote high-level research through long-term funding, reliable evaluation, science-policy expertise and global cooperation. In 2004, its funding for research primarily at universities and research institutes amounted to around 200 million euros.

The Academy is committed to securing the diversity of scientific research and its capacity for renewal and regeneration, and aims to advance the broad application of research in the interests of welfare, culture, the economy and the environment.

A further mission for the Academy is to improve the interaction between basic research and applied academic research and to promote international research cooperation as well as cooperation among research funding agencies.

The Academy also works to raise the public understanding of science and to enhance the esteem and social status of scientific research.

The Academy's highest executive organ is its Board of seven members who are responsible for the Academy's science policy line and the allocation of research appropriations to Research Councils. The Councils decide on research funding within their respective fields. There are four Research Councils: for Biosciences and Environment, Culture and Society, Natural Sciences and Engineering, and Health. The Board and the Research Councils are appointed by the Government for a three-year term; the current term runs from 2004 to 2006.

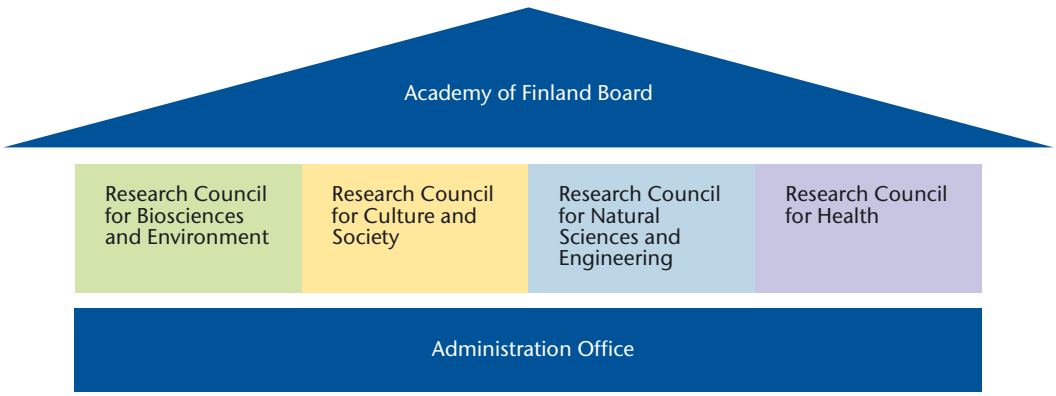
The Administration Office has responsibility for the Academy's administration and its development. It does all the necessary groundwork for official decision-making by the Board, Research Councils and subcommittees, and also implements and monitors their decisions.

The Academy of Finland is keen to ensure that

- Finland can continue to develop as an information and education society where welfare is essentially based upon new knowledge produced by research;
- Finnish research remains at the cutting edge of science; and
- Finnish research environments are internationally competitive.

The Academy's aim is that

- decision-makers and other interest groups look upon the Academy as a reliable, competent and efficient funding agency;
- the Academy's research policy and the way it runs its operation are recognised as best international practice; and
- the Academy is an active and sought-after partner in international cooperation.



2004 in a nutshell

- The new Research Councils took office on 1 January 2004
- Raimo Väyrynen was appointed the Academy's new President for a three-year term on 1 March 2004
- International evaluation of the Academy of Finland completed
- First volume of the History of the Academy of Finland completed
- Industry-Academia working group discussed ways of developing cooperation between basic research and business and industry
- The Academy began work to reform its research funding instruments, development proposals due in early 2005
- European ERA-NET to promote cooperation between national research programmes and research funding bodies launched, the Academy coordinated two ERA-NET projects, BONUS and NORFACE
- International cooperation between funding and science organisations in different countries was deepened further
- The Academy took active part in establishing NordForsk, the Nordic Research Board
- Plans were put in place for an international evaluation of the first national centre of excellence programme 2000–2005
- A total of 143 plans of intent were submitted to the third national centre of excellence programme in 2006–2011, 53 went through to the second round
- Six new research programmes were launched that are funded jointly with the National Technology Agency Tekes and other national funding bodies, such as ministries, research institutes, foundations and business and industry

A year of evaluations

2004 was a year of much activity in Finnish science policy. It may well be described as a year of evaluations. An international evaluation of the Academy of Finland was published in March. Overall, the assessment was highly positive, portraying the Academy as an efficient and credible source of funding for basic research in Finland. There were, of course, some recommendations for improvement as well, regarding for instance the streamlining of its funding instruments and the evaluation of interdisciplinary research projects.

2004 was also a year of evaluations in Finnish science and technology policy more generally. Several reports commissioned by the Science and Technology Policy Council and the Prime Minister's Office were published on such issues as Finland's position in the global economic competition, the national system of government research institutes, the structure of science universities and polytechnics, and technology transfer organisations. There is a perceived need now to update and reform these structures that so far have performed reasonably well.

The evaluations shared certain concerns in common. It is widely felt in Finland that the limited resources of our small country are too scattered and therefore are in need of reorganisation. There is talk about centres of expertise and know-how and about the need for universities to specialise. One of the recommended means is to increase the amount of competitive research funding. The Academy of Finland has long followed this policy by providing funding for centres of excellence in research and research groups working under Academy Professors, for example. Most of these units are based at universities, whose intellectual and economic resources are an important concern for the Academy as well.

A key challenge for science policy is to provide reliable and wide-ranging assessments of the impacts of funded research. This is not always easy, even though the role and importance of basic research should be clear enough. No society can achieve significant cultural, social and technological reforms without the new observations and interpretations produced by basic research. On top of that, it is also necessary to have an atmosphere conducive to reform, efficient institutions, and venture capital and other sources of funding. An effective science and technology policy also requires the ability to look ahead and anticipate possible and probable future scenarios.

Both Finnish and international evaluations have arrived at a positive assessment of the country's science and technology policy system. However, no institution is ever perfect. The Academy of Finland is also working constantly to improve its performance. During the past year, special focus was given to promoting cooperation between academic research and industry, developing the Academy's funding instruments and devising a new strategy for development studies. It is also the Academy's philosophy to maintain constant and open dialogue and interaction with stakeholder groups.

During 2004 the Academy of Finland and the National Technology Agency Tekes continued their efforts to strengthen the coherence of science and technology policy. To this end we signed an agreement of cooperation and launched several joint development projects. All this is based on the principles of mutual autonomy and reciprocal benefits. The impacts of research funding and the interaction between basic research and technology will figure prominently on our agenda for the future as well.

2004 was a year of much activity in international science policy as well. In its capacity as an EU member, Finland has contributed actively to the formulation of EU science and technology policy. This applies most particularly to the preparation of the seventh framework programme where one of the key objectives for the science community has been the establishment of the European Research Council. The Academy of Finland has given its full support to this project. The Academy has also put its weight behind the establishment of the Nordic

Research Board (NordForsk) and supported the structural development of the European Science Foundation.

Multilateral and regional cooperation is gaining ever greater significance in international science policy. This is no way detracts from the significance of bilateral relations of cooperation, although it does mean a shift in emphasis from researcher exchange towards deeper forms of research cooperation. In this cooperation research funding bodies have the role of facilitators and supporters. New information and new applications of science derive in turn from the joint efforts of research groups.

In line with its principles, the Academy of Finland renewed in 2004 its bilateral relations of cooperation with Japan (the Japanese Society for the Promotion of Science) and China (the National Natural Science Foundation of China, the Chinese Academy of Science and the Chinese Academy of Social Sciences). During the year under review we also opened talks with Indian science funding agencies to explore possibilities of cooperation. Apart from European countries, the Academy has had active bilateral cooperation most particularly with Canada. The Finnish academic community traditionally has close ties with the research community in the United States.

The kind of results I have described above cannot be achieved without confidence and cooperation among a wide range of partners. The people appointed to positions of trust in Academy Research Councils and the staff members have had a decisive contribution to the Academy's successful operation. The Academy is a strong expert organisation. In a broader perspective, its cooperation with domestic and foreign partners is continuously generating new information, new influences and new sources of inspiration, which are particularly valuable assets in the science and research community that is in a constant state of flux.

Raimo Väyrynen
President

Research funding in the best interests of science

Education, science and technology have an ever more important part to play in boosting national competitiveness. International comparisons have shown that the Finnish research and innovation system is highly effective, and Finnish research is of a high standard.

Finland has a very high level of research and development investment relative to GDP. R&D funding increased consistently in Finland throughout the 1990s. In 2004, the Government spent 1.54 billion euros on R&D. Finnish R&D expenditure as a proportion of GDP stood at 3.4 per cent. Business R&D expenditure accounted for 69 per cent of total R&D investment.

A survey measuring the implementation of the Lisbon strategy rated Finland among the top performers in 2004 on all indicators and as the most competitive EU country. Denmark came second and Sweden third in this comparison. Among the items measured in this survey are the efficiency of the information society and its financial services and investment in innovation and research. (World Economic Forum, 2004)

In an earlier comparison by the EU Commission in 2003, Finland ranked among the leading countries both in terms of investment in the knowledge-based economy and in terms of the performance of its economy. (Science, Technology and Innovation Key Figures, 2003–2004, EU)

According to the European Innovation Scoreboard, Sweden and Finland were among the leading European performers in 2004. Finland's main strengths were related to high technology patenting and cooperation, and to the turnover of new innovations brought into the marketplace. (European Innovation Scoreboard, 2004, EU)

Competition for research funding continues to intensify

The Academy of Finland is the major source of funding for basic research in Finland. The Academy accounts for 14 per cent of total government research funding. In 2004, Academy funding for basic research in Finland amounted to around 200 million euros.

The Academy provides funding for research projects in the form of general research grants, research programmes and centre of excellence programmes, grants for postdoc researchers and support for international cooperation, researcher training and researcher visits to foreign countries. High-level Finnish research is also supported through posts for Academy Professor and Academy Research Fellow. Most of the resources are allocated to research projects and programmes carried out at

universities and to centres of excellence in research. Academy funding provides for around 3,000 person-years of research.

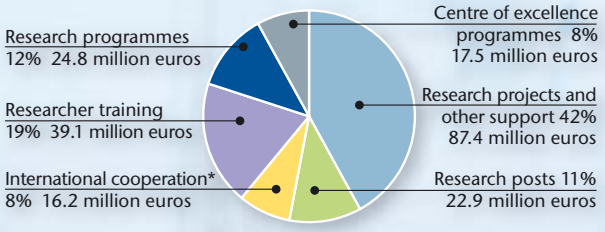
Research projects that received funding in the May call for general research grants accounted for 11 per cent of total Academy research funding in 2004. Research programmes, including Infrastructure Programme, accounted for 12 per cent of all research funding decisions, research posts for 11 per cent and researcher training for 19 per cent. Funding decisions for the latter three-year term of the national centre of excellence programme 2002–2007 were made in autumn 2004. A total of 17.1 million euros was awarded to the 16 centres of excellence selected to take part in the programme.

There is intense competition for Academy research funding. In 2004, the Academy received applications worth around 930 million euros. In the call for general research grants, the amount of funding awarded was 12 per cent of the value of applications received. Funding is made available for a fixed period, usually four years. All funding decisions are based on a scientific review and assessment by domestic and foreign experts of the applications received. In 2004, the evaluation panels involved experts from 15 different countries.

Research programmes to boost science

All Academy research programmes share the common goals of raising the scientific standards of research in the field concerned, developing the field of research or science, and creating new or reinforcing

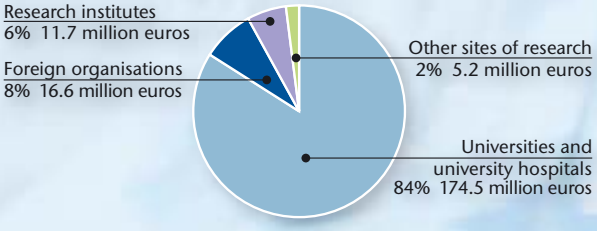
Academy of Finland research funding decisions by type of funding in 2004



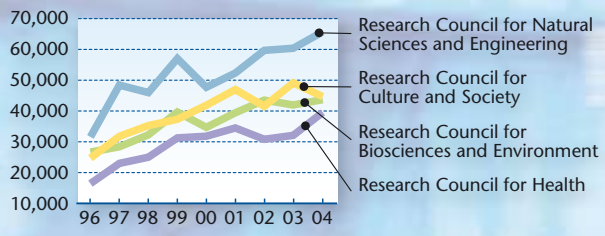
Total 208 million euros

*incl. membership dues to international organisations

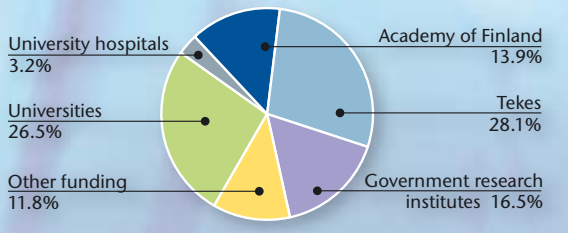
Breakdown of Academy of Finland research funding by site of research in 2004



Academy of Finland research funding by Research Councils in 1996–2004 (1,000 €)



Government R&D funding by organisation in 2004



Source: Statistics Finland

existing scientific traditions and know-how. Research programmes are carried out jointly with the National Technology Agency Tekes and other national funding agencies, such as ministries, research institutes, foundations and business and industry.

In 2004, the Academy had 16 ongoing research programmes, four of which ended during the past year: the Research Programme for Space Research ANTARES, the Sustainable Use of Natural Resources SUNARE, the Research Programme on Finnish Companies and the Challenges of Globalisation LIIKE and the Health Promotion Research Programme TERVE.

Programmes starting up in 2004 included the Environmental, Societal and Health Effects of Genetically Modified Organisms ESGEMO, Russia in Flux, Social Capital and Networks of Trust SOCA, System Biology and Bioinformatics SYSBIO, Industrial Design and the Research Programme on Health Services TERTTU. In addition, an infrastructure programme was carried out in 2004.

ERA-NET networks European research programmes

There has been active international networking among research programmes, most particularly through the EU's ERA-NET instrument. The Academy of Finland is coordinating two ERA-NET projects: BONUS for the Baltic Sea – Network of Funding Agencies, and NORFACE, or New Opportunities for Research Funding Cooperation in Europe – A Strategy for Social Sciences. Furthermore, the Academy was involved in 2004 as a member in eight ERA-NET projects and contributed to preparations for several new projects.

ERA-NET is a new funding instrument aimed at bringing research funding agencies into closer cooperation. ERA-NET projects may involve various measures to enhance international cooperation and coordination, including the exchange of knowledge and know-how concerning evaluation practices or research programme management, for example, and the comparison of research funding agencies' best practices. Projects may lead to the launch of joint European research programmes or to the use of common resources and infrastructure.

Decision on three new programmes

During the past year the Academy Board gave the go-ahead for three new research programmes in 2005. These four-year programmes are the Research Programme on Business Know-how LIIKE 2, the Neuroscience Research Programme NEURO and the Research Programme on the Application of Information Technology in Mechanical, Civil and Automation Engineering KITARA.

International evaluation completed

Commissioned by the Ministry of Education, an international evaluation of the Academy of Finland was published in March. The evaluation panel was chaired by Professor Michael Gibbons (Association

Success rate of applications submitted in the May call for general research grants

Research Council	2000			2001			2002			2003			2004		
	Of applications		Of funding applied	Of applications		Of funding applied	Of applications		Of funding applied	Of applications		Of funding applied	Of applications		Of funding applied
	number	%	%	number	%	%	number	%	%	number	%	%	number	%	%
BE *	64	30	26	46	20	18	40	21	17	40	19	17	37	16	14
CS *	45	26	18	42	24	17	46	22	12	60	27	14	46	17	9
NE *	100	35	20	105	31	20	104	30	14	116	27	12	88	20	12
H *	48	33	19	62	34	16	52	37	15	64	37	15	48	27	15
Total	257	31	21	255	28	18	242	28	15	280	27	14	219	19	12

* BE = Biosciences and Environment, CS = Culture and Society, NE = Natural Sciences and Engineering, H = Health

of Commonwealth Universities, UK) and its other members were Professor Patrick J. Dowling (University of Surrey, UK), Professor Gretty Mirdal (Kobenhavn Universitet, Denmark) and Professor Ralf F. Pettersson (Karolinska Institutet, Sweden). The panel's recommendations included the proposal that the Academy promote interdisciplinarity and develop processes for the evaluation of interdisciplinary projects. This prompted the decision to appoint a working group to look into ways in which the Academy should evaluate interdisciplinary research projects and what kind of indicators can be used in these evaluations. The working group will publish its findings in early 2005.

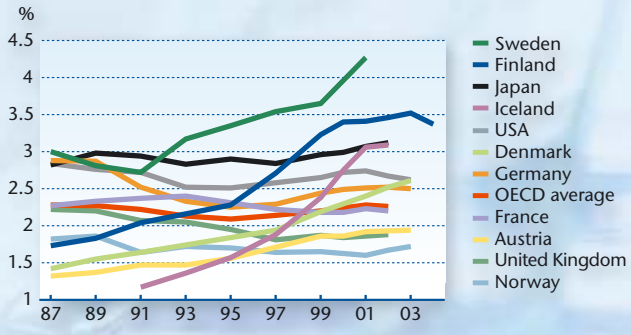
The international evaluation also drew attention to the Academy's wide range of funding instruments and recommended that they be streamlined. The Academy appointed a working group to draft proposals on how to take this forward. Furthermore, the panel suggested that steps be taken to further intensify the cooperation between the Academy of Finland and the National Technology Agency Tekes. The managements of the two organisations have drawn up concrete actions plans covering the various aspects of their operation (e.g. foresight and strategy processes, research and technology programmes, centre of excellence programmes, project funding, international cooperation, evaluation, administrative procedures).

The Academy of Finland and the Finnish Council of University Rectors have stepped up their cooperation. In addition to their annual joint meeting, the Academy management has met with the Council's executive committee to discuss ways of developing cooperation between the Academy and universities with a view to supporting high-level research and promoting the professional research career.

Applications and funding decisions in 2004

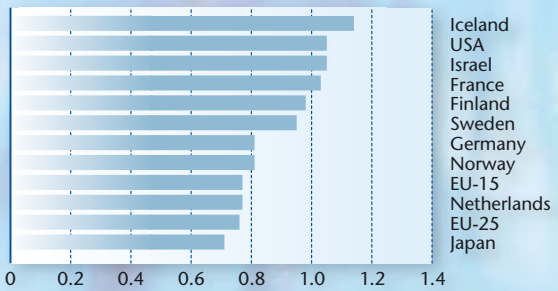
Applications		Funding decisions		Percentage of successfull applications	
euros	number	euros	number	of euros	of number
930,352,105	5,434	207,964,447	2,484	22%	46%

R&D investment in selected OECD countries (R&D spending as % of GDP)



Source: Statistics Finland/OECD

Government budget allocated to R&D as % of GDP in 2003*



* or latest available year

Source: European Commission, Key Figures 2003–2004

Promoting the research career

The continued sustainability of the research system requires an adequate supply of competent researchers and experts. The Academy of Finland promotes researcher training and professional careers in research and aims to increase awareness about the researcher's job particularly among young people.

Finland's increasing R&D investment and the growing number of people working in R&D in the 1990s both attest to the strengthening of the Finnish research system. Indeed along with Sweden, Finland is one of the most active EU members in terms of R&D human resources and investment trends relative to GDP and population.

The Academy of Finland promotes researcher training and professional careers in research by supporting graduate schools and by providing funding for the postdoctoral system, and by increasing the number of posts for Academy Research Fellow. Doctoral students are supported primarily through research project and programme funding. In 2004–2005, the Academy is supporting a pilot project aimed at supporting entrepreneurship training at graduate schools.

An adequate supply of competent researchers and experts is crucially important to the sustainability of the research system. It is the Academy's aim to try and make a career in research a more attractive proposition, to increase the range of research career options and opportunities upon completion of the doctorate and to promote the recruitment of women into research and other expert assignments.

Appointed by the Academy of Finland, the Industry-Academia working group has been charged with the task of preparing a proposal regarding measures for the promotion of researcher training and basic research that serves the needs of business and industry. The working group will publish its recommendations in early 2005.

The Academy Board decided to extend the Equality Plan, originally adopted for 2001–2003, until the end of June 2005. In addition, the Academy appointed in 2004 an equality working group chaired by Professor Riitta Keiski from the Research Council of Natural Sciences and Engineering. The working group is charged with drafting a new Equality Plan that covers the whole of the Academy of Finland. The equality working group will submit its proposal in May 2005.

The Academy supports the internationalisation of researcher training and researcher mobility, and has responsibility for administering the researcher's mobility portal www.aka.fi/eracareers that was opened in summer 2004 as part of the European Commission's and the Sixth EU Framework Programme mobility network. The portal is designed to facilitate the movement of researchers from one country to another and to attract researchers from around the world into Europe. The national mobility portal compiles information on research funding, job opportunities and studies and on other practical issues related to working and living in Finland.

In July 2004, the European Heads of Research Councils (EUROHORCs) granted the first European Young Investigators Awards (EURYI) to 25 talented European researchers. EURYI is a new scheme developed jointly by EUROHORCs and the European Science Foundation (ESF) with a view to supporting the scientific independence of talented young researchers and generating high quality research in Europe. The grant recipients were selected on the basis of open competition and scientific evaluation.

The EURYI awards are funded by national research organisations from 15 European countries. The Finnish contribution comes from the Academy of Finland. There were no Finnish researchers among the 25 first granted researchers.

New Academicians

The President of the Republic granted the honorary title of Academician to historian, Professor Päiviö Tommila. American evolutionary biologist, Professor Jared M. Diamond was awarded the honorary foreign Academician. The title of Academician is the highest honour that the President of the Republic can confer upon a highly distinguished researcher for a life's work in science and research. No more than twelve Finnish scientists and scholars can hold the title of Academician at a time. There are no restrictions on the number of foreign Academicians. In 2004 there were 17 foreign Academicians.

Towards deeper international cooperation

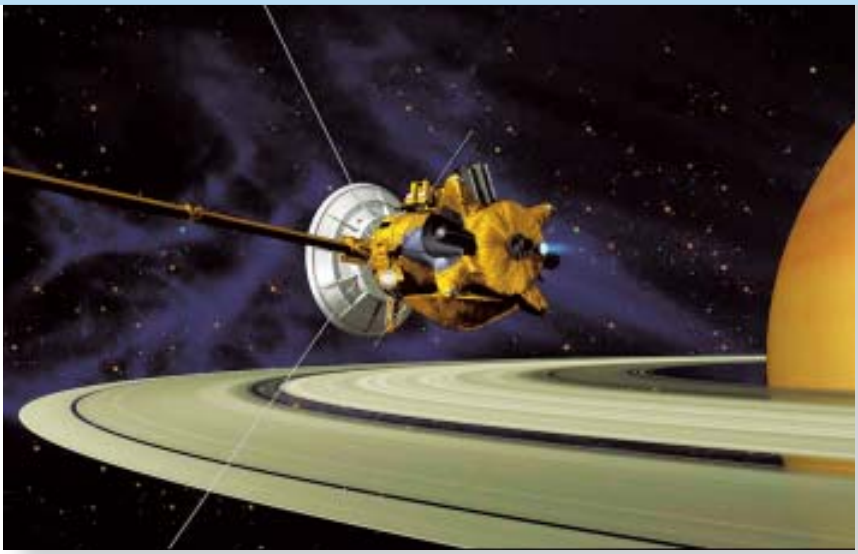
It is the Academy's conviction that its ultimate goal of raising the quality standards of research is best achieved through broader and deeper international exchange and cooperation. In practice, internationalisation is promoted by networking research programmes and centres of excellence in research, by advancing international exchange in researcher training, by increasing awareness of Finnish science and the appeal of Finnish research environments, and by removing obstacles to the mobility of researchers.

In 2004, the Academy took steps to intensify its cooperation with science organisations from a number of different countries. Three new agreements of cooperation were signed with the National Natural Science Foundation of China (NSFC), the Chinese Academy of Sciences (CAS) and the Chinese Academy of Social Sciences (CASS). Agreements with the Japan Society for the Promotion of Science (JSPS) and the Russian Academy of Sciences were renewed. The agreements signed with the Chinese funding agencies and science academies are aimed at promoting joint projects among Finnish and Chinese researchers and at providing funding for research programmes, and thus ultimately at deepening knowledge-based cooperation between the two countries. The agreements cover cooperation in centres of excellence, in thematic programmes and joint research projects as well as researcher mobility.

During the year under review the Academy also had discussions on possibilities for cooperation with Indian research funding and science organisations. The aim is to reach agreement with Indian partners in 2005.

In the future the Academy hopes to place greater emphasis in its international cooperation not only on promoting researcher mobility, but also on funding and evaluating research programmes and projects. The Academy is committed to developing and deepening its existing relations of cooperation and to opening new relations.

The Academy's President Raimo Väyrynen is member of the European Research Advisory Board (EURAB) and the European Heads of Research Councils (EUROHORCs).



Nordic centre of excellence programme in molecular medicine

The Nordic Joint Committee for Medical Research (NOS-M) selected three Nordic centres of excellence in molecular medicine for the 2004–2009 term. Over this five-year period, the Nordic centre of excellence networks that are coordinated in Finland, Sweden and Norway will receive around two million euros each. The funding will allow the units to promote researcher mobility, researcher training and exchange and interaction between Nordic research teams. The networks are aimed at increasing knowledge at the gene and molecular level about diseases and at laying the foundations for more effective treatments. One of the three centres of excellence is a network coordinated by Academy Professor Leena Peltonen-Palotie and comprising six research teams from Finland, Sweden and Denmark. The Nordic Academy for Advanced Study (NorFA, reorganised as NordForsk, the Nordic Research Board, on 1 January 2005) provides funding to graduate schools in connection with this programme. The programme secretariat is based at the Swedish Research Council's Scientific Council for Medicine.

The programme initiative was made by the Nordic Joint Committee for Medical Research (NOS-M), the Nordic Council of Ministers and NorFA, which are also responsible for programme funding. The Academy of Finland's annual contribution to the programme is 120,000 euros.

A Nordic centre of excellence programme has earlier been launched in the field of global change research (2003–2007) in response to an initiative by the Joint Committee of the Nordic Natural Science Research Councils (NOS-N). The aim of this programme is to raise the quality and increase the international visibility of Nordic research and to increase cooperation among and postgraduate training for Nordic researchers in this field. The programme involves four centres of excellence, one of which is headed by Academy Professor Markku Kulmala. NorFA provides funding for two joint Nordic graduate schools in connection with this programme. The programme secretariat is based at the Academy of Finland. Academy funding for the programme amounts to 189,000 euros annually.

Finland joins ESO

In 2004, Parliament adopted a decision which made Finland a member of the European Southern Observatory (ESO). ESO is the world technology leader in the field of astronomy and the world's major astronomical research organisation, providing access for researchers from member countries to large and highly sophisticated telescope equipment and measurement data. It also provides an opportunity for Finnish research institutes and businesses to become involved in the development of methods of data processing and analysis. The ESO observatories are located in Chile.

In connection with the country's ESO membership Finland has launched a 2.5 million euro development project in 2004–2007 focusing on the data analysis environment. Finland's entrance and membership fee will be covered by the Academy of Finland. The annual membership fee will be around 1.8 million euros.

Finns have confidence in science

Finnish people have a high regard for science and confidence in scientists. The Academy of Finland works to increase the public understanding of science and the professional research career by means of information through the mass media, various events for the general public, science fairs and exhibitions and annual awards and prizes for successful researchers. The Academy encourages young people to take up a career in research by organising an annual science competition for senior secondary school students.

People in Finland have confidence in science and scientists. According to the 2004 Science Barometer commissioned by the Finnish Society for Scientific Information, 62 per cent of Finns say they followed developments in science, research and technology with interest. Three-quarters or 78 per cent regarded the quality and level of Finnish science and research as good, and almost 90 per cent thought the level of medicine and technology was good. The clear majority or 70 per cent of the respondents took the view that 'although scientific research requires considerable economic resources, the investment yields a good return'. Science organisations also enjoy broad popular confidence.

The Science Barometer shows that young people are the most interested in science. They have a higher regard than older age groups for the level of technology and they are particularly optimistic about the future development of science.

The Ministry of Education's Research and Society Committee completed its report on the relationship between research and society, the state of science education and science communication practices in Finland. On the basis of its inquiries the committee listed a number of proposals and recommendations geared to promote civic participation in the debate and discussion on the means and aims of research, to strengthen the status of researched knowledge in society and relevant decision-making, to develop science literacy in all age groups and to increase the public understanding of science. The Academy of Finland took part in the work of the Research and Society Committee.

Various events were arranged to bring the general public closer to science and research. The Academy took part in the Man and Cosmos event in Kuhmo, a meeting place for the arts and science. Science cafés aimed at the general public were organised twice during the year under review. The Academy also had its own stand at and contributed with researcher lectures to the September Biotec 2004 event in Helsinki. The Academy was also involved in the Turku Science Fair where its programme was aimed primarily at children and young people.

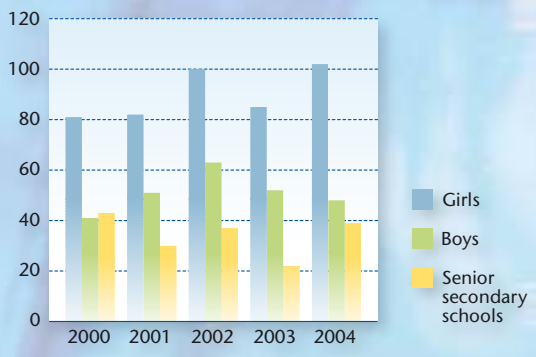
In November, the Second Science Gala at the Old Student House in Helsinki brought together more than 600 guests to honour and celebrate researchers who received recognitions and awards.

A total of 130 entries were received to the science competition for senior secondary school students: 85 entries came from girls, 52 from boys, and seven were by teams of two.

First volume of the History of the Academy of Finland published

The first volume of the History of the Academy of Finland was published. Written by Docent Allan Tiitta under the title 'Top Individuals and Research Councils', it covers the Academy's history from 1948 to 1969 and traces the development of the Finnish system of science administration after the Second World War. The other two volumes of the trilogy will be published in 2005.

Gender breakdown of students and number of schools participating in the science competition for senior secondary school students in 2000-2004



Recognition and incentive awards

The Academy announced its second annual recognition and incentive awards to promising researchers who are at a dynamic stage of career development. An recognition award is presented to a researcher who has contributed significantly to increasing knowledge and awareness about research and the researcher's job, to inspiring public interest in science and research and who has taken part in the public debate in society. An incentive award is granted to a researcher who has shown exceptional creativity, courage and openmindedness in his or her research. The award can be granted for an innovative or original research idea, intellectual audacity in overstepping scientific boundaries, or openmindedness to risk-taking in research.

The Academy's recognition award was presented to Academy Research Fellow Hanna Tuomisto, who has done groundbreaking work in her studies of plant ecology in Amazonian rain forests.

Tuomisto and her Amazon research group are widely recognised for their broad, multidisciplinary approach. They also have close cooperation with the local authorities and researchers, which has facilitated the transfer of their basic research results into the practice of everyday life.

Tuomisto and her team have been particularly interested to find out how variations in natural factors and related distinctive regional characteristics are reflected in the flora, its structure, the composition of plant species and plant reproduction.

The Academy's incentive award was presented to Academy Research Fellow Anna-Stiina Jääskeläinen, whose research is aimed at simplifying and enhancing the efficiency of the pulp production process. Jääskeläinen has been working to develop UV resonance Raman spectroscopy for purposes of determining the structure and quantity of lignin in pulp, i.e. the component that is removed from wood. The method allows researchers to characterise the behaviour of lignin in the bleaching process, which is crucial to making this process more efficient and at the same time environmentally friendlier.

Hanna Tuomisto

Anna-Stiina Jääskeläinen

Knowledge knows no boundaries

Professor Mart Saarma, Director of the Institute of Biotechnology at the University of Helsinki, says international exchange is an integral and inherent part of doing science. "In order to be able to generate new knowledge you must keep up-to-date about the latest research results from all around the world. This is a complex process of co-operation where information is constantly being processed and re-processed," Saarma says.

Saarma studied and took his doctorate at the University of Tartu, Estonia. He has now been in charge of the Institute of Biotechnology in Finland since 1990. Some one-third of the Institute's researchers and one-half of its PhDs come from outside Finland. The working language at the Institute is English.

"If we are to recruit the best experts, we need to have an open international application process. For reasons of professional development and independence it is also extremely important that young Finnish researchers go abroad to work on their PhD or take up a postdoc position."

Saarma's own main area of research interest is in nerve cells and proteins that regulate their survival. Ultimately the aim is to develop new therapies for Parkinson's disease, Alzheimer's disease and other neurodegenerative disorders.

"International cooperation is also crucially important to data collection and analysis: this is the only way we can compile large genome and protein databases."

Increasing cooperation with Eastern Europe

Saarma says he expects EU enlargement to bring increasing cooperation with Eastern European countries.

"We have long-standing contacts with the University of Tartu, the University of Kraków and the Charles University in Prague, for example. The Institute of Biotechnology also has educational co-operation in Estonia, Poland, the Czech Republic and Hungary. In the future we will also have joint research projects," Saarma adds.

One aspect that Saarma feels needs to be given more attention in Finland is the active recruitment of foreign researchers. "In terms of competitiveness and on many other measures Finland ranks among the best performers in the world, but this is not true of the number of foreign researchers. The visa application system is too slow and inflexible for many foreign researchers. We would also need to have more English-language tuition at universities with a view to promoting internationalisation," he concludes.

Research Council for Biosciences and Environment in 2004:

Continued commitment to international cooperation

All the disciplines that come under the aegis of the Research Council for Biosciences and Environment have a strong international orientation and are involved in numerous international research projects. Finnish science and research in these fields enjoys broad international recognition. This provides a solid platform for the further development of international research cooperation.

The Research Council's commitment to promoting international exchange and cooperation is well reflected in its everyday work. The Council supported the international mobility of researchers by means of various funding instruments. Through the forum of ERA-NET, the Council had close research cooperation in Europe, and research programmes opened up new contacts as far afield as China and Canada.

The Council places great importance on supporting the international mobility of young researchers. In 2004, the Council encouraged young PhDs to continue their studies by issuing grants for periods of work and study abroad. The Research Council had 0.5 million euros at its disposal for these purposes. It received 39 applications, 11 of which were funded. One of the decision factors was the diversity of disciplines hosted by the Research Council, including that of environmental law.

In 2004, the Research Council awarded 10.7 million euros to 37 projects in the form of general research grants. Some of these projects had good existing international contacts and networks. Research projects provide an excellent opportunity not only for PhDs but also researchers working on their doctoral thesis to make shorter visits abroad and in this way to gain first hand experience of international cooperation.

One of the key aims of funding for graduate schools since 2003 has been to support their internationalisation. This refers primarily to networking with foreign graduate schools and to the mobility of graduate school students and staff members out of and into Finland. There are 13 graduate schools under the Council's scope of responsibility. Eight of these schools received a total of 40,000 euros in 2004 for purposes of promoting internationalisation. During the year under review graduate schools noticeably stepped up their networking efforts, and the movement of students to foreign countries has clearly increased.

The Research Council conducted a survey to assess client satisfaction. This had two objectives: to describe the current state of the applications review process from the clients' point of view and on this basis to identify development needs. The results indicated that the greater involvement of international experts was considered a definite improvement. In 2004, the Council continued to apply the proven method of using panels and international experts in the review process. One of the Council's panels was a joint panel that reviewed applications for general research grants addressed to the Research Council for Biosciences and Environment and the Research Council for Culture and Society. This provided a more competent and effective forum for weighing applications on the interface of the disciplines hosted by the two councils.

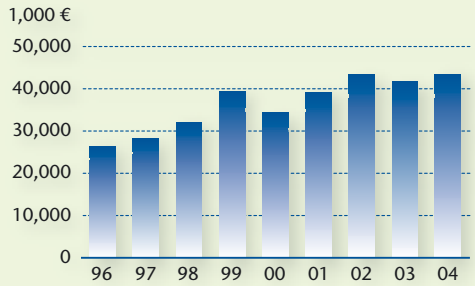
Research programmes internationalise

An important aspect of research programme activities was to look at the international research environment. The Research Council has main responsibility for the Research Programme on Sustainable Use of Natural Resources (SUNARE 2001–2004), the Baltic Sea Research Programme (BIREME 2003–2005), the Research Programme on Wood Material Science (2003–2006) and the Environmental, Societal and Health Effects of Genetically Modified Organisms (ESGEMO 2004–2007) programme. As well as providing support for research projects, the ESGEMO programme has awarded travel grants for researcher visits abroad with a view to promoting GMO research especially in the social context.

The Research Council has continued to pursue its international cooperation mission through ERA-NET projects under the Sixth EU Framework Programme for Research (EU FP6). One Academy-coordinated ERA-NET project that started up in 2004 is the Baltic Sea Science – Network of Funding Agencies (BONUS), which ties in closely with the themes of BIREME. The themes in WoodWisdom-Net (Networking and Integration of National Programmes in the Area of Wood Material Science) are in turn close to those covered in the Finnish-Swedish Research Programme on Wood Material Science. Another ERA-NET that started up in 2004 was ERA-PG (Plant Genomics), which ties in with the themes of the Plant Genomics project programme. Other new ERA-NET projects that the Research Council has been involved in preparing include MarinERA, which brings together European marine research projects; CIRCLE, a network of climate change research; and ERA-SAGE, where the focus is on the social impacts of genome research. Each ERA-NET project involves several European research funding bodies, providing an excellent opportunity for further networking and to set up joint European research programmes – and by the same token to work towards consolidating the European Research Area.

In its preparations for the Neuroscience Research Programme NEURO the Research Council has from the outset worked closely with several inter-

Funding decisions 1996–2004



national bodies. At a European level, most efforts to establish links of cooperation have been through ERA-Neuron, an ERA-NET initiative coordinated by the German BMBF. Elsewhere, the Council has opened contacts with research funding organisations in China (NSFC, CAS), Canada (INMHA/CIHR) and the United States (NSF). As a result of these discussions the Academy of Finland, the NSCF (China) and the INMHA (Canada) will be jointly funding the NEURO programme, which will be opened for applications in spring 2005. The Council has also been involved in preparations for the OECD International Neuroinformatics Coordination Facility (INCF), which will be launched in July 2005. The Academy of Finland will be one of the partners in this project.

International operations will continue to strengthen

The Research Council took active steps to promote research cooperation in the Nordic countries, in Europe and more widely.

The Council is involved in a project funded through the EU FP6 International Cooperation (INCO) programme to support the networking of national contact points of the EU Sustainable Development, Global Change and Ecosystems Programme. The 22 participating countries are looking to find the best way of increasing information and communication so that it would be easier for researchers to find new partners especially in new member countries and in this way to strengthen the European Research Area.

Steps have also been taken to deepen European research cooperation through the European Science Foundation (ESF). The Research Council took part in an extensive ESF development effort to upgrade and improve existing research funding instruments and the application review process by making its own experiences and know-how available to the international research funding community on several forums. The Council is involved in three ESF EUROCORES programmes by providing funding to Finnish research groups that have been successful in international evaluations. These programmes are EuroCLIMATE, EuroDIVERSITY and Science of Protein Production (EuroSCOPE), which is funded jointly with the Research Council for Health.

The Research Council is the Finnish coordinator of two UNESCO science programmes, Man and the Biosphere Programme (MAB) and the International Hydrological Programme (IHP). In September 2004, the Academy joined forces with the Ministry of Education and the Finnish UNESCO Commission to host a seminar dealing with Nordic cooperation in UNESCO science programmes. The seminar was attended by researchers involved in these programmes as well as science administrators from the Nordic and Baltic countries.

The Research Council contributed to the creation of a Nordic Research and Innovation Area (NORIA) within the European Research Area. In spring 2004, the Nordic Research Policy Council (FPR) consulted the opinion of Nordic research councils to identify fields of science and research that are considered the Nordic countries' main areas of strength. The list compiled by the Academy included research in the fields of ecology, bioscience and environmental research. Key criteria in the Council's nominations were the presence of a strong and innovative Nordic research culture or a strong potential to develop into a significant research cluster. Other special criteria included the international visibility of research as well as the value added generated by Nordic cooperation.

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

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

Listening to the environment for an improved quality of life

"Soundscape research is not only about listening to music; we also need to open our ears and listen to the environment," says Academy Research Fellow and University of Turku soundscape researcher Helmi Järviluoma.

Listening to the acoustic environment can pave the way to an improved quality of life. "Listening adds to our awareness of the environment. At the same time this probably adds to our willingness to protect and improve the environment. The local and the international have a simultaneous presence in research because the acoustic environment always has some spatial connection," Järviluoma continues.

The acoustic environment changes in time

Helmi Järviluoma was in charge of the Academy of Finland research project Acoustic Environments in Change, which ended in 2004. The project's final report and two doctoral theses will be published in 2005.

"Researchers Noora Vikman, Heikki Uimonen and Tero Hyvärinen have done a huge job. The results of our research in six countries show how soundscapes have changed over the past 25 years in the wake of radical changes in industries and the rhythm of life," Järviluoma explains.

In her current position as Academy Research Fellow, Järviluoma is researching the soundscape and social memory.

"I am interested in exploring acoustic memories by going on acoustic memory walks with people in Brittany, France. As people walk in a certain soundscape, familiar places bring memories to mind that otherwise would be hard for them to recollect."

Close international cooperation

Helmi Järviluoma first took an interest in soundscape research in the late 1980s when it originally arrived on the shores of Finland.

"Soundscape is a very international area of study. Research is ongoing on all continents around the world and it cuts across various scientific disciplines and genres of art. We have excellent cooperation and networks with colleagues abroad."

Researchers in different countries follow different lines of inquiry and apply different methods. Most of the work in Finland consists of soundscape ethnography, which also includes the study of culture.

"Amidst all this internationalism, however, Finnish language and culture are still very important to me. I want to be able write in my own mother tongue as well," Järviluoma stresses.

Research Council for Culture and Society in 2004:

Funding cooperation at Nordic and European level

As in other fields and disciplines, the growing volume of international research funding in the humanities and social sciences has encouraged increased networking and cooperation among researchers. The general aim is to build up the European Research Area and to increase the international exposure and visibility of Finnish research. As far as research funding bodies are concerned, this requires a more determined and more focused joint effort with both national and international players in the field.

International funding cooperation and the networking and opening up of research programmes have gradually become an integral part of programme planning and preparation. The Research Council for Culture and Society has had good experiences of funding cooperation at both the Nordic and European level.

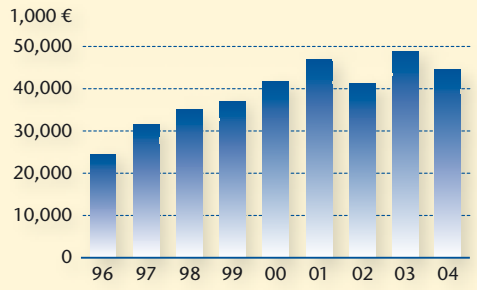
The scene of Nordic cooperation changed significantly with the launch of a jointly funded Nordic centres of excellence programme in the humanities and social sciences. There have also been talks on securing partial funding for the programme from the Nordic Council of Ministers. No specific theme has been identified for the programme that covers all disciplines. Its aim is to increase the visibility and exposure of high-level Nordic research in Europe. Project selection will take place in 2005.

Based on the strong network of cooperation between Nordic research councils and the UK, the EU-funded NORFACE ERA-NET (New Opportunities for Research Funding Cooperation in Europe) project in the social sciences started up in 2004. The Academy-coordinated project was set up by leading social science funding bodies in Finland, Sweden, Norway, Denmark, Iceland, the UK and Ireland; the next stage will see Germany, Holland, Estonia, Portugal and Slovenia join in. Ultimately the aim is to create a research programme jointly funded by all the countries involved. In the humanities a similar joint European project called HERA was launched under Dutch coordination.

Not only social sciences research but also the humanities are presented in the EU Sixth Framework Programme. Although most researchers in these fields have extensive contacts and networks, the forming of research groups at EU level and international networking have marked a new opening. The Seventh Framework Programme for Research will be launched in 2007. The Research Council has been involved in the preparation of that programme, and is pleased to see that the humanities and social sciences will receive greater weight than before.

The Research Council has a long-standing policy of active involvement in the European Science Foundation (ESF) and COST Actions. Among the ESF's most high-profile activities are the EUROCORES programme and Forward Looks.

Funding decisions 1996–2004



The Council was involved in one EUROCORES programme in the humanities and in the ECRP project in the social sciences.

Preparations for cooperation with Chinese science organisations were set in motion, although no agreements were signed on concrete joint projects. Discussions were held with the Russian Foundation for Humanities on an agreement of cooperation, which would add new elements to the Russia in Flux research programme that started in 2003.

Social impacts through research programmes and evaluations

A growing area of focus in the preparation and final evaluation of research programmes in recent years is not only the attainment of purely scientific, but also the generation of research knowledge that has social relevance. The Research Council launched the Environment and Law Research Programme which has the aim of strengthening research on legal and social systems and practices concerning the environment and natural resources. Its main thematic focus is on the issues of transparency and influence. The programme is a multidisciplinary effort involving several different disciplines and universities. Funding is provided to a total of seven projects.

The Research Council commissioned an international panel to evaluate the Research Programme on Marginalisation, Inequality and Ethnic Relations in Finland. The final report offered the critical assessment that it had been overly ambitious in view of the resources made available to the programme. On the other hand, the panel observed that because of the diverse contents of the programme, it was difficult to assess its broader social impacts. According to the panel some of the projects had had good success in bringing its research to public attention, in collaborating with minority groups and even in contributing to the drafting of legislation.

The Council supported research and researcher training at arts universities by providing funding for research into the interaction between the arts and research. Funding was also allocated to ethical and social research on stem cells and to supporting the internationalisation of research on ageing.

During the year under review the Research Council hosted two exploratory workshops in preparation of new programme initiatives. The workshop on the Business Know-how Research Programme was designed to explore potential avenues for following up the Finnish Companies and the Challenges of Globalisation (LIIKE) programme, the biggest ever investment in Finnish research in this field. Upon completion of LIIKE, the new research programme that is starting up in 2005 will be addressing such questions as how business know-how generates social and economic wellbeing in present-day Finland. As well as working on this new programme, the Council carried out a discipline assessment in business know-how. An international panel visited several universities in order to evaluate the state and quality of research. The results of the evaluation will be published in 2005.

Among the issues discussed at the exploratory workshop on the Research Programme on Substance Use and Addictions were drug-related marginalisation, the aetiology of addictions and addiction therapies. The research programme is due to begin in 2006.

Competition for research funding remains intense

The Research Council encourages researchers to innovative approaches and provides funding for significant research in the humanities and social sciences. Its intention is to ensure that even interdisciplinary and other research that breaks down traditional boundaries shall receive a competent and expert review. The Council aims to provide facilities and opportunities for good and significant research in all fields under its area of responsibility.

The Council's single most important funding instrument is represented by research grants that are open for application by research teams. Both the number of applications and the sums applied for are steadily rising. The applications are of a very high standard. For purposes of reviewing applications received by the Council relies increasingly on the services of international experts. However, it is now in the situation where it can provide funding for no more than around one in six projects filing applications. In most cases the average project budget of 220,000 euros is not enough to build up significant projects, but on the other hand this is more than the figure for other research councils. A larger average

project size reduces the overall number of projects for which funding can be provided.

Apart from supporting research projects, another major aim for the Research Council is to promote professional careers in research. In this effort individual research posts for postdoc researchers and Academy Research Fellows played a major part. Competition is particularly intense for research posts. The Council was able to award five-year posts for Academy Research Fellow to no more than one in ten applicants.

Almost 90 per cent of all the funding from the Research Council for Culture and Society goes to researchers working at universities. Universities have begun recently to place growing emphasis on their so-called third task and on the impacts of scientific research. This is not, as such, anything new; research and researchers in the humanities and social sciences have always had close links with the surrounding society. The new challenge now is for research in these fields to demonstrate its concrete impact, which is much harder than in the natural sciences and medicine, for example. As soon as the humanities and social sciences can offer more solid evidence of how they contribute to people's welfare and quality of life, they will also find themselves better placed in the competition for research funding.

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

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

"I worked for ten years in the chemical industry, where I was one of the few physicists amongst the chemists. This was an instructive period for me; I picked up many ideas on how we can contribute to each other's work. This was what triggered my interest in the transdisciplinary," says Olli Ikkala, who is starting his five-year term as Academy Professor in August 2005.

Transdisciplinarity drives materials science revolution

Ikkala's own field of materials science is currently in the midst of a revolution. Traditionally, the field has been divided into such disciplines as chemistry, physics, materials science, electronics and biosciences. With its recent advances, the whole field has moved ever closer to the molecular level. Nanoscience, which combines the expertise of various disciplines, has the aim of developing new material properties by controlling structures less than one hundred nanometres in size.

Externally controlled materials

The research group under Professor Ikkala is interested to study organic polymers and oligomers, which are key to the development of new kinds of smart materials and surfaces.

"Our aim is to develop materials whose properties such as porosity, electrical conductivity and optical properties can be controlled externally," Ikkala explains.

As well as its transdisciplinary orientation, another distinctive characteristic of Ikkala's group is its drive to find links between basic research and applications.

"In reality most of our concepts are still evolving and preliminary, and practical applications are possibly years away."

International cooperation and everyday encounters

Ikkala is keen to stress the importance of cooperation in international networks.

"By exchanging and integrating information in these networks we can create new know-how. Competition in the world markets for talented researchers is intense, and therefore it is important that efforts are stepped up to increase awareness of Finnish research outside the borders of our country."

Contacts between researchers at the local level are equally important.

Research Council for Natural Sciences and Engineering in 2004:

Focus on new research avenues and closer cooperation

The Research Council for Natural Sciences and Engineering focused its efforts on identifying and supporting new, innovative avenues of research as well as on broadly-based cooperation between the research community, research funding bodies and business and industry. All its activities reflected a strong international orientation.

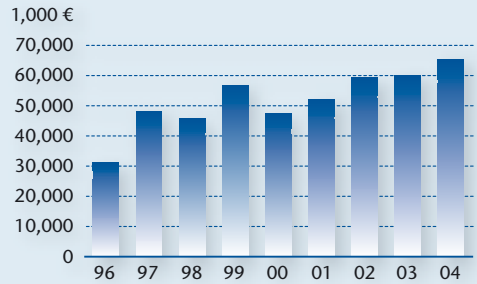
The Research Council for Natural Sciences and Engineering has responsibility for the exact natural sciences as well as the technical disciplines that provide the foundation for Finnish industry. High-quality basic research and the effective application of research results in these fields create a sound basis for economic and sustainable development in society.

The Council has chosen to focus on electronics, electrical engineering, information technology and information processing, all of which are crucial to the information industry. During the year under review an extra 1.1 million euros was allocated to basic research in programming and algorithms and supportive activities. The Research Council took the decision to take part in the joint Nordic research programme on Internet research, Nordunet3. In addition, the Research Programme for Future Electronics (TULE 2003–2006) received a top-up of around half a million euros to boost its thematic component of 'Integrated systems'. A useful new framework for international cooperation in this field of study is the ERA-NET project MATERA, which networks European funding organisations in materials research.

The Research Council also decided to allocate special measures to fields of research that support basic industries. It is considered paramount that researcher training and basic research in these fields be strengthened. In response to a proposal by the Research Council for Natural Sciences and Engineering, the Academy's Board took the decision in November to launch in 2005 a four-year Research Programme on the Application of Information Technology in Mechanical, Civil and Automation Engineering (KITARA, 2005–2009).

The Council allocated 15.2 million euros in research grants that are open for general application. On average, the funding volume of research projects increased by one-third compared to the previous year. One-fifth of all applicants received funding. In value terms this represented about 12 per cent of the total sum of applications received.

Funding decisions 1996–2004



Research funded by the Council has a high impact

During the year under review a survey was carried out to assess the impacts of funding awarded by the Research Council, the scientific achievements of the projects funded and the practical application of their results. The assessment was based on the final reports of research projects whose funding was decided by the Council in 1995–1999.

The researchers in charge of the projects regarded Academy funding as crucial to project success. In particular, they pointed out that Academy funding had made it possible for postgraduate students to gain scientific qualifications, to establish contacts and cooperation and to concentrate more consistently on fundamental issues. Projects funded by the Research Council produced on average around seven refereed journal articles, five conference papers, 0.9 doctoral and Master's level theses and 0.4 Licentiate's theses. New inventions were reported by 27 per cent of the projects, the average number of patents was 0.13 per project. The average amount of funding allocated to research projects was 150,000 euros.

These results on the importance of Academy funding not only to raising the level of know-how and to promoting scientific careers but also to practical application, were further confirmed in a follow-up survey among researchers in charge of projects concluded in 1996 and 1997. The projects were from the fields of electronics, chemistry, mechanical engineering and manufacturing technology, materials and process technology, electrical engineering and information processing sciences. Two-thirds of these projects reported industrial applications or commercialisation of research results within 5.5–7 years of the ending of funding. The number of patents per 150,000 euros of funding was 0.7.

Research programmes promote networking among researchers

Having received authority from the Academy Board to conduct negotiations on the start-up of two programmes, the Council proceeded with preparations for the Research Programme on Chemical, Physical and Biological Nanosciences; and the Research Programme on Sustainable Production. The nanoscience programme has been prepared in close consultation with researchers, other Academy research councils, national and international funding bodies and business and industry representatives. The Academy is involved in the ERA-NET project NanoSci-ERA, which would provide direct links with European research programmes in this field. As for the Research Programme on Sustainable Production, the Council has entered into discussions with the French science and ecology ministries on international funding cooperation. Both programmes are due to start up in 2006.

The call for applications for the Research Programme on the Application of Information Technology in Mechanical, Civil and Automation Engineering (KITARA, 2005–2009) was opened in August 2004. The programme supports the Academy's and the National Technology Agency's (Tekes) common goals of strengthening research in mechanical and civil engineering and supporting the formation of high-level research groups. The Confederation of Finnish Construction Industries RT, the Finnish Association of Building Owners and Construction Clients, Tekes and the Ministry of the Environment will also be supporting projects in this research programme. A total of 128 research groups were involved in the 44 consortium applications received in the call, and their combined value was in excess of 33 million euros. The Academy has earmarked 5.5 million euros for this programme.

The completion of Telectronics II in 2003 marked the end of a six-year investment programme in basic research in the datacommunications sector. The international evaluation of the research programme in 2004 concluded that the scientific outputs and innovations of the programme as well as the international networking of the projects involved were highly successful.

The Research Programme for Space Research (ANTARES), jointly funded by the Academy of Finland and Tekes, was also evaluated in 2004. Academy funding for the programme amounted to 4.6 million euros. The programme involved 11 projects focusing on various aspects of space science and remote sensing. According to the international

evaluation panel the programme outputs have boosted the position of Finnish researchers in the field of space research. The cooperation of research groups, experienced instrument developers and industry in the context of development projects was also commended.

International cooperation an integral part of activities

In 2004, the Research Council took active part in Nordic cooperation. It decided to provide funding for the joint Nordic research programme on Internet research, Nordunet3, and to continue its funding for the Nordic Data Grid project in 2005. Originally launched as a two-year project, the aim of Data Grid is to lay the foundation for a Nordic Grid centre. For the two-year term starting in November 2003, the chair of the Research Council for Natural Sciences and Engineering will also be chairing the Joint Committee of the Nordic Natural Science Research Councils (NOS-N).

The agreement among the seven EISCAT Associates, which together fund and manage a European ionosphere radar facility in the Nordic countries, is due to expire at year-end 2006. Negotiations on a new agreement and the possible accession of new members have been ongoing throughout 2004. Since EISCAT has been a great success for Finnish near space research, the Council takes the view that Finland should remain a founder member beyond 2006.

On the European front, the Research Council decided to take part in two ESF EUROCORES programmes, i.e. European Solar Terrestrial and Atmospheric Research (E-STAR) and Smart Structural Systems Technologies (S3T). Furthermore, the Council joined four new ESF à la carte programmes designed to support the networking of researchers and research groups.

The Research Council decided to take part in the International Continental Drilling Programme (ICDP) in 2005–2009. The view taken by the Council was that participation in ICDP would support internationalisation in this field and promote researcher mobility, which was one of the key recommendations of the 2003 discipline assessment of geosciences in Finland.

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

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

Mitochondrial research is an international endeavour

For Academy Research Fellow, Docent Anu Wartiovaara, international exchange is a natural and integral part of her job. She is concerned in her research with cellular energy metabolism and diseases caused by metabolic disorders, i.e. mitochondrial diseases.

"Mitochondria researchers have a close international network. If we are having difficulties with a new method or other similar problems, I can send out a student from our group to Minneapolis, for instance. Samples and materials are also frequently exchanged between research groups based in different countries," Wartiovaara explains.

Wartiovaara is in charge of one of three research teams working under the FinMIT centre of excellence at Biomedicum, University of Helsinki. The other two FinMIT teams are headed by Professor Howard Jacobs and Docent Johannes Spelbrink at the University of Tampere. Professor Jacobs's research team was awarded the EU Descartes Prize in December 2004.

Network provides concrete help

Anu Wartiovaara's work in the field of mitochondrial research has brought her the Europe & Médecine Junior Prize for 2004 and the prestigious Anders Jahre Prize for young medical researchers in 2003. She has been involved in the European Molecular Biology Organization's (EMBO) three-year Young Investigator Programme since 2003, working in that context to build up an international network of co-operation among talented young scientists.

"This programme is intended primarily for researchers who have just set up their own group. The network provides concrete help and support with practical research issues, such as access to the European Molecular Biology Laboratory (EMBL) antibody production unit."

"Students may attend courses organised by other groups in the programme, and the joint European network facilitates recruitment as well. If we had our own EMBL research unit in Finland, that would no doubt help to bring in more researchers and further intensify international contacts," Wartiovaara says.

Research Council for Health in 2004:

The dissemination of research knowledge is crucial to the effective application of research

Strong health research is crucially important to the promotion of public health and the development of health care. The Research Council for Health continued in 2004 to support a diversity of research, bearing in mind the needs of smaller disciplines. The identification of new emerging disciplines and the proper timing of funding are paramount to the success of the Council's research strategy.

The effective application of research depends on the broad dissemination of research knowledge and scientific debate on the validity of the evidence produced. The aim of the regular consensus meetings that are jointly organised by the Academy of Finland and the Finnish Medical Society Duodecim is to assess the validity of medical procedures by reference to the existing evidence. On the basis of the debate and discussion at these meetings, a consensus statement is drafted on recommended practice and on future directions for research. A further purpose of the consensus meeting and statement is to provide accurate and up-to-date information to health care professionals, decision-makers and the general audience. The consensus meeting in November on menopausal hormone therapy debated the reliability of the existing research knowledge and the benefits and drawbacks of hormone therapy.

The Research Council visited the universities of Helsinki, Jyväskylä, Kuopio, Oulu, Tampere and Turku, all of which have research and education programmes in the disciplines that come under the Council's domain. During these visits Council members provided information on the work and the funding principles of the Academy of Finland and the Research Council for Health in particular. Discussions were also held with researchers about the future prospects of their disciplines, and they were encouraged to maintain active contact with the Council.

Identifying emerging new disciplines

The Research Council continued in 2004 to support a diversity of research, bearing in mind the needs of smaller disciplines. Nutrition and food researchers were invited to an exploratory workshop in December on the subject of 'Nutrition, foodstuffs and health'; the purpose was to review and discuss the current state and development prospects for Finnish research in this field, to assess research needs, to outline new goals for research and to draft proposals for development plans. Changes in nutrition and eating culture are a key factor behind a number of growing public health problems. High-level nutrition and food research can help to unravel the causes and consequences of these problems. The Council is working closely with other Academy research councils to prepare a research programme on the subject of 'Nutrition, food and health', and also seeking funding cooperation from other partners, including the National Technology Agency Tekes and the Ministry of Agriculture and Forestry. Key objectives of the programme will be to promote national and international cooperation among researchers in this field and to strengthen a multidisciplinary research approach.

The identification of new emerging disciplines and the proper timing of funding for these fields are paramount to the success of the Council's research

strategy. Stem cell research is one of the fields that has promising potential applications in the treatment of diseases. The Council has taken an active part in charting and participating in international funding cooperation in stem cell research. It participates in the International Stem Cell Forum launched at the initiative of the British Medical Research Council, which is aimed at promoting stem cell research among other things by coordinating the characterisation of stem cells lines produced in different parts of the world. Furthermore, the Council is involved in the ESF EUROCORES programme on the development of a stem cell tool box (EuroSTELLS). Stem cell research was also promoted through joint funding programmes with other Academy research councils and the US-based Juvenile Diabetes Research Foundation (JDRF). A total of around 2.5 million euros was granted to 15 projects. The nature of stem cell research required that special attention was given to the ethical assessment of the projects funded.

New programmes in the pipeline

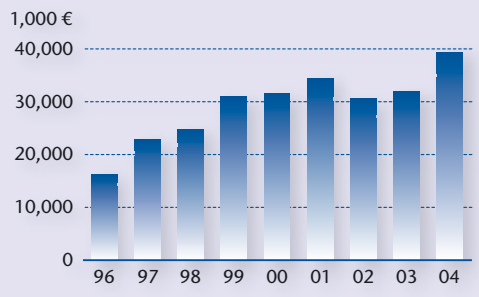
The Research Council was also actively involved in preparing programme initiatives administered by other Academy research councils. In 2004, the Council joined forces with the Research Council for Culture and Society to prepare a research programme on substance use and addictions, and with all other research councils to prepare a neuroscience research programme.

The Research Council had responsibility for four ongoing research programmes: Health Promotion (TERVE 2001–2004), Microbes and Man (MICMAN 2002–2006), Systems Biology and Bioinformatics (SYSBIO 2004–2007) and Health Services (TERTTU 2004–2007). The Council also took part in the National Technology Agency's Drug 2000 technology programme. All research programmes under the Research Council's purview are implemented jointly with other Academy research councils and where possible with other funding bodies. Both the MICMAN and the SYSBIO programmes have international cooperation with other European research programmes in the context of the Pathogenomics and EUSYSBIO projects.

Discipline and research field assessments and final programme evaluations are all-important tools in developing science and research. Together with the Research Council for Culture and Society, the Research Council for Health started to carry out the recommendations from the final evaluation of the Research Programme on Ageing (ITU, 2000–2002) by allocating funds for the international networking of ageing research. These funds were intended primarily for purposes of promoting the mobility of Finnish researchers, participation in workshops and researcher visits, postgraduate training in foreign research groups and networking with research teams in different countries. A total of around one million euros was granted to seven projects. The Council also supported the internationalisation of ageing research through its involvement in the ERA-AGE network, which brings together funding for research on ageing from a broad range of EU countries. Domestic cooperation in the field of ageing research was supported by setting up a joint forum for ageing researchers. The aim of this forum is to promote the interaction between funding bodies, researchers and end-users of research results. The first forum on ageing research was organised jointly with other funding bodies and research institutes in December.

During the year under review the Research Council commissioned a final evaluation of the Research Programme on Biological Functions (Life 2000, 2000–2003), which was jointly administered by the Research Council for Health and the Research Council for Biosciences and Environment. Carried out by a panel of international experts, the evaluation commended the programme for the inclusion on its agenda of ethical and social impacts, for its efforts in science popularisation and for its multidisciplinary approach. The Life 2000 programme, which was jointly implemented by all four Academy research councils, was the biggest ever Academy research programme in terms of funding volume.

Funding decisions 1996–2004



Developing research career models for clinical researchers

The Research Council is committed to supporting the research career development at its different stages and in different lines of research. It has been the most successful in supporting young researchers in connection with research career appointments: more than one-half of all posts for Academy Research Fellow were awarded to researchers under age 40. In 2004, the Council was particularly alerted by the small number of clinical researchers among postdoctoral researchers and Academy Research Fellows, and it started discussions with university hospitals on the development of research career models for clinical researchers.

Another key challenge for the Research Council is to strengthen the position of Finnish health research and to increase the domestic and international competitiveness of business and industry that is based on health research. Wherever possible the Council has advocated the inclusion in the EU FP6 priority area of 'Life sciences, genomics and biotechnology for health' those themes that are important to Finnish researchers and informed them about open calls in the Framework Programme. During the year under review almost one in six applications to the call in the first EU priority area involved Finnish applicants. One in three of these applications were shortlisted for funding, and almost half of them were rated as worthy of funding had the necessary funds been available.

The Nordic and Baltic countries and Finland's neighbouring regions all figure prominently in the Research Council's future planning for international cooperation. The Council visited Tartu University, Estonia, to get acquainted with research in the fields of molecular biology and biomedicine, and discussions were started on potential collaborations. Working closely with other Nordic funding bodies, the Council continued preparations for and launched the Nordic centres of excellence programme in 2004–2009. Three centres of excellence were appointed to the programme, two of which involve Finnish researchers. Annual funding for the programme amounts to almost 1.2 million euros, i.e. almost 400,000 euros per unit. The aim of the programme is to increase the international exposure and visibility of Nordic molecular medicine and to support postgraduate training and research cooperation among research groups at the cutting edge of Nordic research.

Fields of research hosted by the Research Council for Health:

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

Funding decisions of the Academy of Finland in 2002–2004 by field of research*

Field of research	2004	%	2003	%	2002	%
Natural sciences	**91,136,890**	**44**	**78,637,267**	**44**	**81,882,412**	**46**
Space research and astronomy	3,161,010		2,493,090		1,356,958	
Biology, environmental sciences	32,863,330		31,698,010		34,387,839	
Physics**	22,464,420		22,867,477		22,647,537	
Geosciences, meteorology	5,279,330		1,899,490		1,762,652	
Chemistry	9,953,800		5,493,540		6,453,859	
Geography	1,410,620		1,455,540		1,458,315	
Mathematics	6,282,360		5,077,990		4,135,290	
Information processing science	9,722,020		7,652,130		9,679,962	
Engineering	**22,786,910**	**11**	**15,444,120**	**8**	**15,822,755**	**9**
Architecture	413,220		107,440		132,390	
Biotechnology and food engineering	2,295,360		682,980		862,512	
Energy technology	101,590		26,430		252,660	
Mechanical engineering	1,837,820		1,247,790		1,582,350	
Metallurgy and extractive engineering	394,750		121,810		436,958	
Other engineering	184,720		636,850		379,860	
Process and materials technology	3,942,270		2,055,470		1,805,726	
Wood processing technology	371,250		21,220		21,000	
Construction engineering, community planning and municipal engineering	1,347,030		549,580		308,790	
Electronical engineering	9,547,960		8,290,000		9,623,489	
Chemical engineering and chemical process technology	2,350,940		1,704,550		417,020	
Medicine and health sciences	**43,999,580**	**21**	**32,158,470**	**17**	**29,830,019**	**17**
Medicine and nursing science	1,590		-		-	
Biomedicine	26,675,480		14,849,300		14,361,385	
Veterinary medicine	719,060		176,720		461,700	
Pharmacy	2,625,400		693,920		751,672	
Dental science	816,760		1,017,320		57,862	
Nursing science	195,190		299,760		34,840	
Public health science	4,142,420		7,950,750		2,873,646	
Clinical medicine	7,692,450		6,541,650		10,305,574	
Sports sciences	574,220		169,410		94,790	
Nutrition science	557,010		459,640		888,550	
Agriculture and forestry	**2,720,070**	**1**	**7,823,540**	**4**	**6,463,860**	**4**
Agricultural sciences, food sciences	438,850		3,822,990		2,443,002	
Forest sciences	2,281,220		4,000,550		4,020,858	
Social sciences	**28,696,120**	**14**	**29,637,516**	**16**	**24,045,670**	**14**
Economics	1,562,600		2,526,610		1,516,002	
Education	1,691,830		2,709,050		6,008,272	
Business economics, economic geography	3,005,690		3,336,190		2,403,900	
Law	3,262,860		3,170,860		1,966,811	
Psychology	5,655,360		3,205,610		4,187,147	
Social science	8,299,070		9,667,392		5,141,504	
Statistics	54,780		147,934		118,990	
Political science and administration	2,351,430		3,750,580		2,139,414	
Communication, library science and information science	2,812,500		1,123,290		563,630	
Humanities	**18,574,877**	**9**	**20,736,480**	**11**	**18,414,223**	**10**
Philosophy	2,489,197		3,103,920		2,322,805	
History and archaeology	3,755,370		4,331,460		4,330,371	
Philology and linguistics	3,646,150		4,463,200		4,569,727	
Cultures research	1,863,140		2,200,440		2,601,613	
Aesthetic fields research and literature	3,976,230		4,608,990		2,655,189	
Theology	2,844,790		2,028,470		1,934,518	
Others	**50,000**	**0**				
Total	207,964,447	100	184,437,393	100	176,458,939	100

* The figures also include the costs of research posts, in calculated value.
** The figure includes the CERN membership dues.

Funding decisions of the Academy of Finland in 2002–2004 by site of research*

Site of research	2004	%	2003	%	2002	%
Universities	**173,476,787**	**83.4**	**150,526,083**	**81.6**	**147,260,155**	**83.5**
Helsinki School of Economics and Business Administration	2,020,890	1.0	911,780	0.5	1,899,096	1.1
University of Helsinki	63,698,407	30.6	51,102,989	27.7	52,086,806	29.5
University of Joensuu	5,097,470	2.5	6,911,030	3.7	5,239,820	3.0
University of Jyväskylä	14,143,830	6.8	13,618,520	7.4	14,810,429	8.4
University of Kuopio	8,070,070	3.9	5,926,040	3.2	4,519,188	2.6
University of Lapland	989,810	0.5	1,692,210	0.9	1,516,147	0.9
Lappeenranta University of Technology	1,583,210	0.8	1,623,720	0.9	1,135,320	0.6
National Defence College			750	0.0		
University of Oulu	13,441,280	6.5	9,567,920	5.2	13,211,766	7.5
Sibelius Academy	719,010	0.3	267,920	0.1	31,560	0.0
Swedish School of Economics and Business Administration	42,400	0.0	1,013,990	0.5	18,580	0.0
University of Art and Design Helsinki	789,990	0.4	1,124,300	0.6	385,597	0.2
Tampere University of Technology	6,161,360	3.0	5,914,040	3.2	6,261,761	3.5
University of Tampere	9,531,450	4.6	10,853,924	5.9	8,046,025	4.6
Theatre Academy	150,870	0.1		0.0		0.0
Helsinki University of Technology	20,718,100	10.0	14,645,940	7.9	16,678,303	9.5
Turku School of Economics and Business Administration	724,280	0.3	832,260	0.5	517,780	0.3
University of Turku	17,533,830	8.4	19,133,260	10.4	14,096,576	8.0
University of Vaasa	278,050	0.1	192,990	0.1	146,574	0.1
Åbo Akademi University	7,782,480	3.7	5,192,500	2.8	6,658,827	3.8
University hospitals	**1,066,600**	**0.5**	**1,088,310**	**0.6**	**750,809**	**0.4**
Research institutes	**11,729,200**	**5.6**	**13,910,530**	**7.5**	**10,663,087**	**6.0**
Foreign organisations	**16,530,090**	**7.9**	**16,068,940**	**8.7**	**14,960,697**	**8.5**
Scientific societies	**1,371,080**	**0.7**	**1,374,970**	**0.7**	**1,565,639**	**0.9**
Polytechnics	**77,740**	**0.0**	**10,900**	**0.0**	**11,660**	**0.0**
Business companies	**308,310**	**0.1**	**346,730**	**0.2**	**520,510**	**0.3**
Other site of research	**3,363,280**	**1.6**	**994,020**	**0.5**	**520,918**	**0.3**
Individual researchers	**41,360**	**0.0**	**116,910**	**0.1**	**205,464**	**0.1**
Total	207,964,447	100	184,437,393	100	176,458,939	100

Academy of Finland Administration Office: Management and Directors and Secretaries of the Units in 2004

Management
Reijo Vihko, President (until 29 Feb 2004)
Raimo Väyrynen, President (as of 1 Mar 2004)
Jarmo Laine, Senior Science Counsel (Senior Adviser to President)
Lea Ryynänen-Karjalainen, Senior Science Counsel (Senior Adviser to President, until 31 May 2004)
Irmeli Rautiainen, Assistant to Management

Juha Sarkio, Vice President, Administration
Päivi Kulo, Assistant to Management

Anneli Pauli, Vice President, Research
Anne Heinänen, Senior Science Counsel (Senior Adviser to Vice President)
Anja Raatikainen, Assistant to Management

Biosciences and Environment Research Unit
Arja Kallio, Director
Riitta Järvinen, Secretary

Culture and Society Research Unit
Liisa Savunen, Director
Maija Ryhänen, Secretary

Natural Sciences and Engineering Research Unit
Susan Linko, Director
Aila Hagelin, Secretary

Health Research Unit
Riitta Mustonen, Director
Anneli Rajala, Secretary

Information Management Unit
Seppo Raejärvi, Director
Anneli Kauranen, IT Support

International Relations Unit
Raija Hattula, Director
Arja Bqain, Secretary

Finance Unit
Pirkko Virtanen, Director
Merja Hyttinen, Finance Officer

Communications Unit
Maj-Lis Tanner, Communications Director
Riitta Tirronen, Acting Communications Director (as of 1 Oct 2004)
Marjo Aaltomaa, Communications Assistant

Administration Unit
Hedvig Mikkolanniemi, Director (until 31 Jan 2004)
Maarit Saarela, Director (as of 1 Feb 2004)
Inkeri Tyynelä, Department Secretary

Services Unit
Seppo Hongisto, Development Manager
Pirjo Moisander, Senior Services Officer (until 12 Oct 2004)
Olavi Väisänen, Senior Services Officer (as of 13 Oct 2004)

Board and Research Council Members of the Academy of Finland in 2004

Board 2004–2006

Chair
Reijo Vihko, Professor
President of the Academy of Finland (until 29 Feb 2004)
Raimo Väyrynen, Professor
President of the Academy of Finland (as of 1 Mar 2004)

Vice Chair
Markku Karlsson
Vice Senior President
Metso Corporation

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

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

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

Pirkko Nuolijärvi, Director
Research Institute for the Language in Finland

Kalervo Väänänen, Professor
Research Council for Health
University of Turku

Research Council for Biosciences and Environment

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

Leena Hömmö, Director
Bio- and Genetechnology
Ministry of Agriculture and Forestry

Juha Kämäri, Professor
Environmental Change Research
Finnish Environment Institute

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

Markku Löytönen, Professor
Cultural Geography
University of Helsinki

Raili Myllylä, Professor
Biochemistry
University of Oulu

Pasi Puttonen, Professor
Silvaculture
University of Helsinki

Eevi Rintamäki, Professor
Plant Biology
University of Turku

Liselotte Sundström, Professor
Evolution Biology, Ecology
University of Helsinki

Matti Vornanen, Professor
Animal Physiology
University of Joensuu

Karl Åkerman, Professor
Cell Biology
University of Kuopio

Research Council for Culture and Society

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

Matti Heikkilä,
Research Professor
Social Policy
National Centre for Welfare and Health, Stakes

Eila Helander, Professor
Church and Social Studies
University of Helsinki

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

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

Urpo Nikanne, Professor
Finnish Language and Literature
Åbo Akademi University

Anna Raija Nummenmaa
Professor (as of 1 Aug 2004)
Education
University of Tampere

Kyösti Pekonen, Professor
Political Science
University of Helsinki

Raija-Leena Punamäki
Professor
Psychology
University of Tampere

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

Marja Tuominen, Professor
Cultural History
University of Lapland

Krista Varantola, Professor
(until 31 Jul 2004)
English Language
University of Tampere

Research Council for Natural Sciences and Engineering

Chair
Riitta Keiski, Professor
Chemical Process Engineering
University of Oulu

Iiro Hartimo, Professor
Electronics
Helsinki University of Technology

Hannu Hänninen, Professor
Mechanical Engineering
Helsinki University of Technology

Timo Jääskeläinen, Professor
Physics
University of Joensuu

Mikko Kara, Professor
Energy Technology
VTT Technical Research Centre

Kirsti Loukola Ruskeeniemi
Professor
Geology, Geochemistry
Helsinki University of Technology

Pertti Mattila, Professor
Mathematics
University of Helsinki

Pirkko Oittinen, Professor
Media Technology
Helsinki University of Technology

Kari Rissanen, Professor
Organic Chemistry
University of Jyväskylä

Ulla Ruotsalainen, Docent
Medical Engineering
Tampere University of Technology

Kaisa Sere, Professor
Computer Science
Åbo Akademi University

Research Council for Health

Chair
Kalervo Väänänen, Professor
Biomedicine
University of Turku

Anssi Auvinen, Professor
Epidemiology
University of Tampere

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

Jorma Keski-Oja, Professor
Cancer Biology
University of Helsinki

Anna-Elina Lehesjoki, Professor
Medical Genetics
University of Helsinki

Helena Leino-Kilpi, Professor
Nursing Science
University of Turku

Pirjo Pietinen,
Research Professor
Nutrional Epidemiology
National Public Health Institute

Tuula Salo, Professor
Oral Pathology
University of Oulu

Hilkka Soininen, Professor
Clinical Sciences
University of Kuopio

Arto Urtti, Professor
Biopharmacy
University of Kuopio

Timo Vesikari, Professor
Virology
University of Tampere

Academy Professors in 2004

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

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

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

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

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

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

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

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

Auli Hakulinen
1 Aug 2001–31 Jul 2004
Finnish Descriptive Grammar
University of Helsinki

Ilkka Hanski
1 Aug 1996–31 Jul 2006
Metapopulation Biology
University of Helsinki

Riitta Hari
1 Aug 1999–31 Jul 2004
Human Cortical Functions: Neuromagnetic Approach
Helsinki University of Technology

Erkki Haukioja
1 Aug 2000–31 Jul 2005
Evolutionary-ecological Effects of Atmospheric Pollution
University of Turku

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

Seppo Honkapohja
1 Aug 2000–29 Feb 2004
Learning Behaviour and Other Topics in Macroeconomics
University of Helsinki

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

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

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

Olli-Pekka Kallioniemi
1 Aug 2004–31 Jul 2009
Functional and Translational Canceromics
University of Helsinki

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

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

Simo Knuuttila
1 Aug 2004–31 Jul 2009
1. The History of the Philosophy of Mind 2. From Philosophy to Science 3. Medieval Trinitarian Theology Studies in Philosophy of Religion
University of Helsinki

Matti Krusius
1 Aug 1999–31 Jul 2004
Topological Objects in Quantum Fluids
Helsinki University of Technology

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

Antti Kupiainen
1 Aug 2004–31 Jul 2009
Mathematical Physics
University of Helsinki

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

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

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

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

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

Risto Näätänen
as from 1 Aug 1983 with tenure
Cognitive Function and Its Neural Basis
University of Helsinki

Erkki Oja
1 Aug 2000–31 Jul 2005
New Information Processing Principles
Helsinki University of Technology

Tapio Palva
1 Aug 1999–31 Jul 2004
Molecular Analysis of Adaptive Responses on Plants
University of Helsinki

Jukka Pekola
1 Aug 2000–31 Jul 2005
Fabrication and Sensor Applications of Nanostructures
Helsinki University of Technology

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

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

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

Yrjö Sepänmaa
1 Aug 2000–31 Jul 2005
The Theory and Practice of Applied Environmental Aesthetics
University of Joensuu

Anna-Leena Siikala
1 Aug 1999–31 Jul 2004
Myths, History, Society: National Traditions in Global World
University of Helsinki

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

Kaarina Sivonen
1 Aug 2000–31 Jul 2005
Cyanobacteria and Their Bioactive Compounds
University of Helsinki

Jaakko Tuomilehto
1 Aug 2000–31 Jul 2005
Epidemiology and Genetics of Diabetes and Rheumatoid Arthritis in Finland
National Public Health Institute

Pertti Törmälä
1 Aug 1995–31 Jul 2005
Studies of Biodegradable Polymer Materials and Composites
Tampere University of Technology

Esko Ukkonen
1 Aug 1999–31 Jul 2004
Pattern Matching and Machine Learning – Algorithms and Biocomputing Applications
University of Helsinki

Ulla Vuorela
1 Aug 1999–31 Jul 2004
Minna Canth Academy Professorship (Women Studies and Gender Equality) The Rich, the Poor and the Resourceful. Gender and Development in Postcolonialist Context
University of Tampere

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

Hannele Yki-Järvinen
1 Aug 1995–31 Jul 2005
Mechanisms of Glucose Toxicity
University of Helsinki

Centres of Excellence in Research in 2004

The centres of excellence in research nominated by the Academy of Finland for 2000–2005

Ancient and Medieval Greek Documents, Archives and Libraries
University of Helsinki

Cell Surface Receptors in Inflammation and Malignancies
University of Turku

Center for Activity Theory and Developmental Work Research
University of Helsinki

Centre of Excellence in Disease Genetics
University of Helsinki, National Public Health Institute and Folkhälsan

Computational Condensed-matter and Complex Materials Research Unit
Helsinki University of Technology

Evolutionary Ecology
University of Jyväskylä

Helsinki Bioenergetics Group
University of Helsinki

Institute of Hydraulics and Automation
Tampere University of Technology

Low Temperature Laboratory: Physics and Brain Research Units
Helsinki University of Technology

Molecular Biology and Pathology of Collagens and Enzymes of Collagen Biosynthesis
University of Oulu

New Information Processing Principles
Helsinki University of Technology

Nuclear and Condensed Matter Physics Programme at JYFL
University of Jyväskylä

Plant Molecular Biology and Forest Biotechnology Research Unit
University of Helsinki

Program in Cancer Biology, Growth Control and Angiogenesis
University of Helsinki

Programme of Molecular Neurobiology
University of Helsinki

Programme on Structural Virology
University of Helsinki

Research Centre for Computational Science and Engineering
Helsinki University of Technology

Research Unit for Forest Ecology and Management
University of Joensuu

Research Unit for Variation and Change in English
University of Helsinki

Research Unit on the Formation of Early Jewish and Christian Ideology
University of Helsinki and Åbo Akademi University

Signal Processing Algorithm Group
Tampere University of Technology

The Human Development and Its Risk Factors Programme
University of Jyväskylä

The Metapopulation Research Group
University of Helsinki

Tissue Engineering and Medical, Dental and Veterinary Biomaterial Research Group
Tampere University of Technology, University of Helsinki, University of Kuopio, University of Oulu and Helsinki University of Technology

VTT Industrial Biotechnology
Technical Research Centre of Finland

Åbo Akademi University
Process Chemistry Group
Åbo Akademi University

The centres of excellence in research nominated by the Academy of Finland for 2002–2007

Applied Microbiology Research Unit
University of Helsinki

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

Centre for Environmental Health Risk Assessment
National Public Health Institute and University of Helsinki

Centre of Excellence for Research in Cardiovascular Diseases and Type 2 Diabetes
University of Kuopio

Centre of Population Genetic Analyses
University of Oulu and University of Helsinki

Developmental Biology Research Programme
University of Helsinki

Finnish Research Unit for Mitochondrial Biogenesis and Disease (FinMIT)
University of Tampere and University of Helsinki

Formal Methods in Programming
Åbo Akademi University

From Data to Knowledge Research Unit
University of Helsinki and Helsinki University of Technology

Helsinki Brain Research Centre
University of Helsinki, Helsinki University of Technology and Helsinki and Uusimaa Hospital District

History of Mind Research Unit
University of Helsinki and University of Jyväskylä

Research Unit of Geometric Analysis and Mathematical Physics
University of Helsinki and University of Jyväskylä

Research Programme on Male Reproductive Health
University of Turku

Research Unit on Economic Structures and Growth
University of Helsinki

Research Unit on Physics, Chemistry and Biology of Atmospheric Composition and Climate Change
University of Helsinki, University of Kuopio and the Finnish Meteorological Institute

Smart and Novel Radios Research Unit
Helsinki University of Technology

Nordic Centres of Excellence in Global Change Research 2003–2007

Nordic Centre for Studies of Ecosystem Carbon Exchange and Its Interactions with the Climate System

Research Centre on Biosphere – Aerosol – Cloud – Climate Interactions

The Dynamics of Ecological Systems under the Influence of Climatic Variation

The Nordic Centre for Luminescence Research: Supporting Climate Change Research by the Provision of Precise and Accurate Chronological Control

Nordic Centres of Excellence in Molecular Medicine 2004–2009

Nordic Centre of Excellence for Research in Water Imbalance Related Disorders (WIRED)

Nordic Centre of Excellence in Neurodegeneration

Nordic Network of Excellence in Disease Genetics (NoNEDG)

Honorary title of Academician

The highest recognition to scientists and scholars

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

Finnish holders of the honorary title of Academician

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

Foreign holders of the honorary title of Academician

Sir Arnold Burgen, Great Britain
Alfred W. Crosby, USA
Jared M. Diamond, USA
Ludvig D. Faddeyev, Russia
Hans Fromm, Germany
Bengt Hultqvist, Sweden
Ancel Keys, USA (d. 2004)
Leon Lederman, USA
Yuri Ivanovish Marchuk, Russia
Sanjit K. Mitra, USA
Martha Nussbaum, USA
Birgitta Odén, Sweden
Richard Peto, Great Britain
Lennart Philipson, USA
Darwin J. Prockop, USA
Stig Strömholm, Sweden
Richard Villems, Estonia

Research Programmes in 2004

Baltic Sea, BIREME (2003–2005)

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

Finnish Companies and the Challenge of Globalisation, LIIKE (2001–2004)

Future Electronics, TULE (2004–2007)

Health Promotion, TERVE (2001–2004)

Health Services Research, TERTTU (2004–2007)

Industrial Design (2004–2007)

Life as Learning, LEARN (2002–2006)

Microbes and Man, MICMAN (2002–2006)

Proactive Computing, PROACT (2002–2005)

Russia in Flux (2004–2007)

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

Space Research, ANTARES (2001–2004)

Sustainable Use of Natural Resources, SUNARE (2001–2004)

Systems Biology and Bioinformatics, SYSBIO (2004–2007)

Telecommunication Electronics, TELECTRONICS II (2001–2004)

Academy of Finland Publications Series in 2004

1/04 Challenges for basic research in the field of construction and real estate. Report of the working group (In Finnish only)

2/04 Research Programme for Telecommunication Electronics II 2001–2003. Evaluation Report

3/04 Research Programme on Marginalisation, Inequality and Ethnic Relations in Finland. Evaluation Report

4/04 Research Programme on Biological Functions, Life 2000. Evaluation Report

5/04 From Genes to Ethics Research for a New Millennium. Final Report of the Life 2000 Research Programme. Mika Tirronen & Laura Walin

6/04 Research Programme for Space Research 2001–2004. Evaluation Report

Other material in 2004

Printed:

Academy of Finland Annual Report 2003

Academy of Finland Research Funding. Guide for Applicants

Academy of Finland in Brief. Brochure in Finnish, Swedish, English, French, German and Spanish

Akateemikot – Academicians 2004

Nordic Centre of Excellence Programme

ProAcademia magazine (two issues)

Research Programme for Space Research 2001–2004. Final Report

Research Programme for Telecommunication Electronics. Final Report

Internet:

Academy of Finland web pages in Finnish, English and Swedish (www.aka.fi, www.aka.fi/eng, www.aka.fi/svenska)

Academy of Finland presentation CD (pdf files of Annual Report in Finnish and English, Academy in Brief in English, Finnish and Swedish)

Academy of Finland presentation transparencies in English, Finnish and Swedish

The Researcher's Mobility Portal Finland (www.aka.fi/eracareers)

L'année des évaluations

Raimo Väyrynen
Directeur général

L'année 2004 a été une année très fertile pour la politique scientifique finlandaise. On pourrait même l'appeler l'année des évaluations. Une évaluation internationale de l'Académie de Finlande a été publiée en mars. Dans son ensemble, l'appréciation a été hautement positive; l'Académie y est décrite comme un financeur de la recherche fondamentale finlandaise efficace et fiable. On y trouve aussi naturellement des suggestions d'amélioration, par exemple la rationalisation des instruments de financement utilisés ainsi que le développement de l'évaluation des projets de recherche interdisciplinaires.

L'année 2004 a été l'année des évaluations de la politique finlandaise scientifique et technologique aussi en général. Plusieurs rapports, commandités par le Conseil national de la science et de la technologie ou le Secrétariat général du Premier ministre, ont été publiés. Ils traitaient de sujets tels que la position de la Finlande dans la compétition économique à l'échelle mondiale, le système national des établissements de recherche, la structure des établissements d'enseignement supérieur scientifiques et professionnels ainsi que les organisations de transfert de la technologie. Il est apparu qu'il sera nécessaire de réorganiser ces structures jusqu'à présent satisfaisantes.

On retrouve plusieurs points communs entre les différentes évaluations. Le sentiment général en Finlande est que les ressources limitées d'un petit pays sont trop dispersées et ont besoin, par conséquent, d'être réorganisées. On parle de la concentration des compétences et du besoin de spécialisation des universités dans des domaines forts. Les moyens suggérés sont notamment l'augmentation de financement de la recherche avec appels à candidature. L'Académie de Finlande a déjà adopté cette politique de longue date, en finançant par exemple des centres d'excellence et des groupes de recherche dirigés par des Professeurs de l'Académie de Finlande.

L'année 2004 a été riche aussi en événements sur la scène politique scientifique internationale. En tant que membre de l'Union européenne, la Finlande a contribué activement à la formulation de la politique scientifique et technologique de l'UE et tout particulièrement à la préparation du 7e programme-cadre pour la recherche dans lequel l'un des objectifs-clés pour la communauté scientifique a été la création du Conseil de la recherche européen. L'Académie de Finlande a pleinement soutenu ce projet.

Dans la politique scientifique internationale, la collaboration multilatérale et régionale occupe une place toujours plus importante. Ceci ne marque pas la disparition de l'importance des collaborations bilatérales, mais cela signifie que l'axe porteur bascule de l'échange de chercheurs vers une collaboration plus approfondie en matière de recherche. Les financeurs de la recherche sont les promoteurs et les piliers de cette collaboration. En revanche, ce sont les efforts communs des équipes de chercheurs qui donnent naissance à de nouveaux savoirs et à de nouvelles applications.

Conformément à ses principes, l'Académie de Finlande a renouvelé, en 2004, ses relations de coopération bilatérales avec le Japon et la Chine. Nous avons également, durant cette même année, engagé des négociations avec les agences Indiennes de financement de la science pour étudier les possibilités de coopération.

Les résultats décrits ci-dessus ne pourraient être atteints sans une relation de confiance et de collaboration entre les nombreux protagonistes. Les personnes nommées à des postes de responsabilité dans les comités scientifiques et l'ensemble du personnel ont joué un rôle déterminant dans la réussite de l'Académie de Finlande. L'Académie est une organisation d'experts forte. À une plus grande échelle, la coopération avec des partenaires nationaux et étrangers catalyse sans cesse de nouvelles informations, de nouvelles influences et de nouvelles sources d'inspiration. Ce sont des ressources d'une grande valeur dans une communauté scientifique en perpétuel mouvement.

La concurrence pour obtenir des crédits de recherche devient plus serrée

L'Académie de Finlande est le principal organisme de financement de la recherche fondamentale en Finlande. Sur ses budgets de financement de la recherche, l'État octroie 14 pour cent à l'Académie. L'année 2004, l'Académie a financé la recherche fondamentale finlandaise à hauteur d'environ 200 millions d'euros.

L'Académie finance des projets de recherche sous différentes formes: financement général des projets de recherche, programmes de recherche, programmes de centres d'excellence de la recherche et elle soutient également la collaboration internationale de diverses manières, ainsi que la formation doctorale et le travail des chercheurs à l'étranger. Les postes de professeur et de chercheur à l'Académie de Finlande contribuent également à aider la recherche finlandaise de haut niveau. La majeure partie des ressources est dirigée vers les programmes et les projets de recherche réalisés dans les universités ainsi que vers le financement des centres d'excellence de la recherche. Le financement annuel de l'Académie de Finlande représente environ 3000 années-homme.

Sur les crédits de recherche accordés par l'Académie en 2004, la part des projets retenus lors du financement général des projets de recherche de mai représentait 11 pour cent. Les décisions de financement ont été réparties de la manière suivante: 12 pour cent pour les programmes de recherche, 11 pour cent pour les postes de recherche et 19 pour cent pour la formation doctorale. Les décisions de financement pour la seconde tranche de trois ans du programme de centres d'excellence national 2002-2007 ont été prises en automne 2004. Les 16 centres d'excellence financés par le programme recevront 17,1 millions d'euros.

La concurrence en vue d'obtenir un financement par l'Académie de Finlande est très serrée. En 2004, le montant total des dossiers reçus par l'Académie atteignait environ 930 millions d'euros. Sur le total des soumissions déposées lors de l'appel du financement général des projets de recherche, le financement accordé correspond à 12 pour cent des montants sollicités. Le financement est à durée déterminée et couvre en général une période de quatre ans. Les décisions de financement des projets se basent sur une évaluation scientifique établie par des spécialistes nationaux et étrangers. L'année passée, des experts de 15 pays différents ont participé aux panels d'évaluation.

Les programmes de recherche se mettent en réseau à l'échelle internationale

Les points de départ des programmes de recherche de l'Académie sont les suivants: élévation du niveau scientifique du domaine de recherche choisi, développement du domaine de recherche ou du domaine scientifique, création ou renforcement des pratiques et compétences scientifiques, nouvelles ou existantes. Les programmes de recherche sont mis en place avec la collaboration de Tekes (Agence nationale pour le développement technologique) et d'autres financeurs nationaux tels que les ministères, les instituts de recherche, les fondations et la vie économique.

En 2004, l'Académie avait en cours 16 programmes de recherche dont quatre se sont achevés l'année

passée: le programme de recherche spatiale ANTARES, le pôle environnemental SUNARE (Utilisation durable des réserves naturelles), les entreprises finlandaises et les challenges de la compétition mondiale LIIKE ainsi que le programme de recherche pour la promotion de la santé TERVE.

Les programmes qui ont démarré en 2004 sont: ESGEMO programme de recherche sur les effets environnementaux, sociaux et sur la santé des organismes génétiquement modifiés, la Russie en mutation, SOCA le capital social et les réseaux de confiance, SYSBIO, la biologie de systèmes et la bioinformatique, le design industriel et TERTTU, programme pour la recherche en santé publique. Un programme infrastructurel a également été achevé en 2004.

La mise en réseau international des programmes de recherche s'est faite de manière active, tout particulièrement grâce aux instruments du programme-cadre ERA-NET. L'Académie de Finlande coordonne deux ERA-NET: BONUS , les organisations de financement de la recherche des pays de la Mer Baltique (BONUS for the Baltic Sea – Network of Funding Agencies) et NORFACE, qui développe la recherche en sciences sociales (New Opportunities for Research Funding Cooperation in Europe – A Strategy for Social Sciences). De plus, en 2004, l'Académie de Finlande était membre de huit projets ERA-NET et participait à l'élaboration de plusieurs autres.

Promouvoir la carrière de chercheur

Pour assurer la pérennité de la recherche, il est indispensable de former suffisamment de spécialistes et de chercheurs de haut niveau. L'Académie de Finlande encourage la formation doctorale et la profession de chercheur, elle contribue également à faire connaître le travail de chercheur, particulièrement auprès des jeunes.

Le renforcement du système de recherche finlandais se voit non seulement sous l'aspect de l'augmentation des crédits alloués à la recherche et au développement, mais également dans la croissance du personnel de la R&D dans les années 1990. La Finlande est d'ailleurs, avec la Suède, l'un des États membres de l'Union européenne les plus actifs au niveau des activités de recherche et de développement si l'on considère le développement des ressources humaines et du financement par rapport à l'économie nationale et au nombre d'habitants.

L'Académie de Finlande favorise la formation doctorale et la carrière de chercheur professionnel en soutenant les écoles doctorales, en finançant le système de chercheur postdoctoral à l'Académie de Finlande et en augmentant le nombre de postes de chercheurs auprès de l'Académie de Finlande. Les doctorants sont soutenus principalement dans le cadre du financement de projets ou de programmes.

Le groupe de travail Industry-Academia mis en place par l'Académie avait pour mission de préparer une proposition sur les actions à prendre par l'Académie pour que la formation doctorale et la recherche fondamentale soient à même de servir la vie économique, ainsi que pour développer des modes de coopération entre la vie économique et l'Académie. Le groupe de travail publiera sa proposition au début de l'année 2005.

Vers une collaboration internationale plus approfondie

En 2004, l'Académie a renforcé la coopération avec des organisations scientifiques de nombreux pays. L'Académie a signé trois nouveaux types de contrats avec des organisations scientifiques chinoises, National Natural Science Foundation of China (NSFC), Chinese Academy of Sciences (CAS) et Chinese Academy of Social Sciences (CASS) et a renouvelé les contrats de coopération avec l'organisation Japan Society for the Promotion of Science (JSPS) et l'Académie des sciences de Russie. Les contrats conclus entre les financeurs de la recherche chinois et japonais et les académies scientifiques ont pour but de promouvoir les projets collaboratifs aux chercheurs finlandais et chinois, japonais ou russe, de financer les programmes de recherche communs et, par ce moyen, approfondir la coopération fondée sur la connaissance entre les pays. Les contrats couvrent la collaboration pour la recherche de pointe, les programmes thématiques, les projets de recherche communs ainsi que la mobilité des chercheurs.

Dans l'avenir, l'Académie de Finlande souhaite développer la collaboration internationale de manière à non seulement promouvoir la mobilité des chercheurs, mais également renforcer la coopération dans le domaine du financement et de l'évaluation des programmes et des projets. L'Académie développe et approfondit avec détermination les relations déjà existantes et en noue de nouvelles.

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