

*Academy*

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2005



ACADEMY OF FINLAND  
RESEARCH FUNDING AND EXPERTISE



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# A YEAR OF STRUCTURAL CHANGES

*Raimo Väyrynen, President*

“Competition for funding is continuing to intensify”



Scientific research is a dynamic process, and major structural changes are now sweeping its national and international environments. The year under review offers numerous examples. Changes have been set in motion, and implementation is continuing regardless of the boundaries of calendar years.

The funding solution adopted by the European Union for the Seventh Framework Programme for Research in 2007–2013 leaves much to be desired. However, if it is applied in the right way, it provides good opportunity to emphasise the importance of basic research. The Austrian and Finnish governments have indicated that during their respective presidencies in 2006, they will be placing particular emphasis on the preparation of the Framework Programme. The creation of the European Research Council has opened up completely new prospects for supporting basic research that relies on competition and peer evaluation.

The new strategy published by the European Science Foundation in autumn 2005 certainly deserves attention. It is important to support its consistent implementation.

The Finnish Government's decision in April 2005 on the structural development of the public research system can be seen as a major landmark in the country's official science and technology policy. The decision calls upon universities to identify their own areas of strength and to develop the division of labour among themselves. According to the Government decision, this will partly be achieved by an increase in competitive research funding. In this the Academy has a key role to play.

The Finnish Government has also allocated additional resources to the internationalisation of the Finnish science community and highlighted the need to create new kinds of expertise clusters.

In spite of the greater resources made available, competitive research funding in Finland finds itself in an increasingly difficult position because the continuing qualitative and quantitative growth of the science community means that competition for funding is increasingly fierce. No more than between 10 and 20 per cent of the number of applications for funding through the Academy's key funding instruments are now being accepted. Too many research projects are being turned down and not getting the money they need, even though they are rated as excellent. In practice, this means that a growing proportion of our highly skilled and trained scientific resources remains untapped.

During the past year there have been ever louder calls for increased efficiency and impact in research funding. The Academy of Finland is working to address these challenges. We have commissioned external experts to look into the matter. For purposes of the ongoing review of the state and quality of scientific research in Finland, the Academy's Research Councils have conducted impact assessments of their respective disciplines.

The Academy of Finland is constantly working to find the best possible balance between the quality and impacts of research. We believe that the high international standard of Finnish science is the best guarantee that research continues to have a positive and diverse impact on social, economic and cultural development.

# L'ANNÉE DES CHANGEMENTS STRUCTURELS



*Raimo Väyrynen, Directeur général*

”La concurrence pour obtenir un financement devient de plus en plus ardue”

Par définition, la recherche scientifique est dynamique, mais elle est également soumise aux changements structurels de l'environnement national et international. Le bilan annuel 2005 offre de nombreux exemples de cette situation. Des changements ont été amorcés et leur réalisation sera effective indépendamment des limites du calendrier annuel.

Les solutions de financement du 7e programme-cadre de la recherche de l'Union européenne pour 2007–2013 laissent beaucoup à désirer. Appliquées de manière appropriée, elles permettent cependant de renforcer l'importance de la recherche fondamentale. Les gouvernements autrichien et finlandais ont indiqué que, durant leur présidence en 2006, ils allaient mettre tout particulièrement l'accent sur la préparation du programme-cadre de la recherche. La naissance du Conseil Européen de la Recherche (European Research Council) ouvre de nouvelles opportunités pour le soutien d'une recherche fondamentale à grande échelle et tirant parti de la compétition et de l'évaluation entre pairs.

Il est important de prendre en considération la nouvelle stratégie de la Fondation Européenne de la Science et de soutenir sa réalisation.

L'un des jalons de la politique scientifique et technologique du gouvernement finlandais est la décision, prise par le conseil des ministres en avril 2005, de développer structurellement le système de la recherche publique. Les universités doivent redéfinir leurs domaines de compétence et développer une répartition mutuelle des tâches. Ceci pourra être en partie réalisé, conformément à la décision du conseil des ministres, en faisant encore plus porter les efforts

sur un financement de la recherche soumis à la concurrence. L'Académie de Finlande tient un rôle majeur dans ce scénario.

En dépit du fait que ses ressources sont en augmentation, le financement finlandais de la recherche est en train de s'engager sur une voie de plus en plus difficile du fait que, dû à une expansion en volume et en qualité de la communauté scientifique, la concurrence pour obtenir un financement devient de plus en plus ardue. En ce qui concerne les principaux instruments de financement de l'Académie de Finlande, seuls entre 10 et 20 pour cent des dossiers déposés reçoivent une décision favorable. Autrement dit, beaucoup trop de projets de recherche d'un niveau exceptionnel restent sans financement. En pratique, cela signifie qu'une partie toujours plus importante des ressources scientifiques hautement qualifiées restent inexploitées.

Durant l'année écoulée, les exigences pour une augmentation de l'efficacité et de l'influence du financement de la recherche sont devenues de plus en plus insistantes. L'Académie de Finlande s'efforce de répondre à ces défis. Les comités scientifiques ont examiné l'influence de leurs propres domaines scientifiques et c'est sur cette base que sera établi le rapport, en cours de rédaction, sur la situation et le niveau de la science en Finlande.

L'Académie de Finlande est constamment en recherche du meilleur équilibre entre la qualité et l'influence de la recherche. Nous sommes persuadés que le haut niveau international de la recherche finlandaise est la meilleure garantie que la recherche aura une influence positive et polyvalente sur le développement de la société, de l'économie et de la culture.

# A TIME FOR CHANGES



*The 24-volume J.V. Snellman project carried out at the Academy of Finland was successfully completed.*



## Finland invests in research

Government investment in R&D increased to 1.6 billion euros in 2005, up by 56 million euros on the figure the previous year. In nominal terms R&D funding increased by 3.6 per cent, in real terms by one per cent. Research spending as a proportion of total government expenditure was unchanged at 4.5 per cent.

The administrative branch under the Ministry of Education received the largest increase in R&D funding at 24 million euros. However, the proportions allocated to the Academy of Finland and to the National Technology Agency Tekes, which provides competitive research funding under the Ministry of Trade and Industry, remained unchanged in 2005. Research funding for universities amounted to 417 million euros. Funding for other research went up the most by 27 million euros. Core funding for government research institutes increased only slightly on 2004.

In 2004, R&D spending in Finland amounted to almost 5.3 billion euros. Early indications for 2005 are that growth in R&D expenditure was relatively slow and that its share of GDP remained at the same level as in the previous year at 3.5 per cent.

Finland's R&D investment as a proportion of GDP is still among the highest in the world. In this comparison Finland is third only to Israel and Sweden.

## Towards clusters of expertise

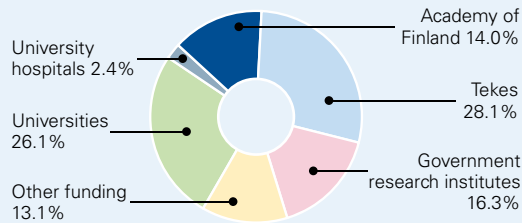
The main focus of science policy debate in 2005 was on the development of the Finnish research system and on the impacts and effectiveness of science. The Government took a decision-in-principle on the structural development of the public research system, setting out the principles and future direction for the development over the next few years of organisations involved in directing, funding and conducting research.

According to the decision-in-principle, it is important for public, private and foreign research funding bodies to work more closely in order to strengthen and increase the number of expertise clusters at the highest level. The Academy of Finland, Tekes and the Finnish National Fund for Research and Development Sitra are called upon to join forces with other funding agencies in an attempt to increase the impact of research and innovation funding. The aim is to create larger operating units.

Furthermore, the decision-in-principle calls upon ministries to increase cooperation with the Academy and Tekes. The university institution should be developed into an internationally competitive, high-quality university system operating in Finland's main areas of strength and producing new research openings and initiatives. Universities should work to strengthen their international competitiveness by sharpening their profile and by raising the quality of research, promoting multidisciplinary and recruiting internationally high-level research personnel.



### Government R&D funding in 2005



Source: Statistics Finland, 2005

The Science and Technology Policy Council of Finland appointed a steering group to oversee the drafting of an expertise cluster and infrastructure strategy. The steering group was chaired by the Academy President.

#### The impact of research and its assessment

The impact and effectiveness of science and technology policy and research funding is a subject of much current discussion and debate in all advanced countries. Impact requirements are particularly emphasised by knowledge-based national strategies and by the increased levels of research investment. Since 2005, one of the missions identified for universities

in the new Universities Act is to promote the impact of research funding in society.

Surveys commissioned by the Academy of Finland in the early 2000s suggest that the scientific impact of Finnish research has indeed increased since at least the late 1990s. Finnish researchers are publishing more often in leading international publications, and Finnish publications are having a greater impact on development in their respective fields. Very little is still known about the mechanisms of societal impact, which may comprise cultural, ecological, economic, social and technological impacts, and the methods of assessment are now at a stage of intense development.

The scientific and societal impacts of research

#### R&D expenditure by sector and share of GDP in 1998–2004 and estimate for 2005

Year	Private sector		Public sector <sup>2)</sup>		University sector <sup>3)</sup>		Total	R&D expenditure as proportion of GDP <sup>4)</sup>	
	million euros	%	million euros	%	million euros	%		million euros	%
1998	2,252.8	67.2	443.9	13.2	657.8	19.6	3,354.5	2.86	
1999	2,643.9	68.2	470.1	12.1	764.8	19.7	3,878.8	3.21	
2000	3,135.9	70.9	497.4	11.2	789.3	17.8	4,422.6	3.38	
2001	3,284.0	71.1	500.9	10.8	834.1	18.1	4,619.0	3.38	
2002	3,375.1	69.9	529.7	11.0	925.6	19.2	4,830.3	3.43	
2003	3,527.9	70.5	515.4	10.3	961.7	19.2	5,005.0	3.48	
2004	3,683.5	70.1	530.1	10.1	1,039.8	19.8	5,253.4	3.51	
2005 <sup>1)</sup>	3,770.3	70.0	538.4	10.1	1,079.7	20.0	5,388.4	3.52	

1) estimate based on survey responses and other calculations

2) including private non-profit sector

3) including polytechnics since 1999

4) GDP 2003 and 2004 Statistics Finland preliminary data, GDP 2005 Ministry of Finance projection

Source: Research and Development 2004. Statistics Finland, 2005



*Aimed primarily at young people, the Academy of Finland Science Weeks toured four cities; the exhibition and lectures focused on foodstuffs and health.*



are regularly assessed by the Academy in connection with its funding decisions. In addition to this, the Academy has set up a dedicated project called SIGHT 2006 to assess the impacts of Academy research funding as well as the current state, standard and future of Finnish scientific research.

A project commissioned by the Academy under the title of “Methods for Evaluating the Impact of Basic Research Funding: An Analysis of Recent International Evaluation Activity” has been looking at the methods used by 99 international funding agencies and 23 research institutes and assessing their applicability in Finland. The project report is due for publication in 2006.

In 2005, the Academy’s Research Councils conducted assessments of the impact of their research funding. The results will be published in spring 2006. A panel of external experts under the chairmanship of Professor Jussi Huttunen began its own assessment of the impact of Academy research funding.

One of the components of the SIGHT 2006 project is a bibliometric analysis to compare the impact and effectiveness of Finnish science and research with 30 other OECD countries. In Finland, comparisons are also made between different fields of research and different units.

### **Evaluation of research funding and research programmes**

Compared against the amount of monies available, it is fair to conclude that the Academy has been successful in its mission of providing funding for basic re-

search, even though competition has continued to intensify with the growing number of applications. The changes made to the Academy’s funding instruments and the introduction of online services and new application periods mean that continued efforts will be needed to further develop procedures for the review and evaluation of applications. One of the questions that will need to be addressed in the future is how to speed up the process of evaluation.

Evaluations of research programmes provide valuable tools for the development of research as well as for science policy. In 2005, international evaluation reports were completed on three research programmes: Sustainable Use of Natural Resources, Health Promotion, and Interaction across the Gulf of Bothnia. The reports made several recommendations for the development of programme planning and implementation and for the development of the fields of research represented in the research programmes.

### **Major foresight project**

For purposes of science and technology policy in general and the development of research funding in particular, it is increasingly important to be able to anticipate changes in the national and international operating environment. Foresight is an integral part of the strategic management and direction of research and innovation for all EU Member States and for the European Commission.

In 2005, the Academy and Tekes joined forces to launch the first ever Finnish foresight project in the field of science and technology policy. The FinnSight



“Impact assessments are increasingly important in basic research”

2015 project will monitor the changes taking place in the global operating environment, explore the challenges facing the development of research and innovation and seek to identify the areas of expertise that are crucial to the development of science, technology and business.

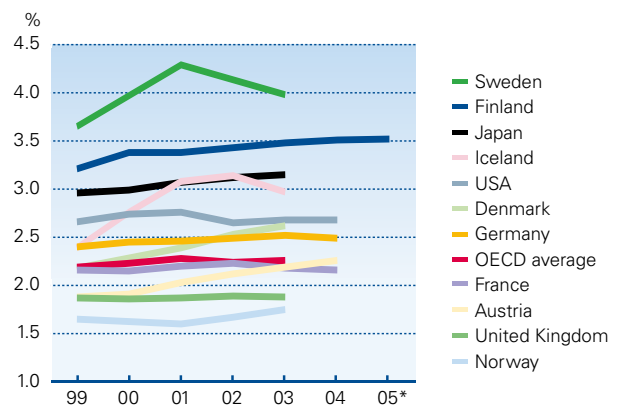
Experts involved in FinnSight 2015 will be working in ten different panels concentrating on the themes of learning and learning society; services and service innovations; welfare and health; environment and energy; infrastructures and security; bio-expertise and bio-society; information and communications; understanding and human interaction; materials; and the global economy.

Most of the 120 experts working on the panels represent research and business and industry. The results of the FinnSight 2015 project will be published in 2006.

### Online services

The Academy Board took a decision-in-principle on a changeover to online services by the end of 2006. The decision applies to applications for research funding, expert statements, the processing of applications in Research Councils and reports on the use of research funding.

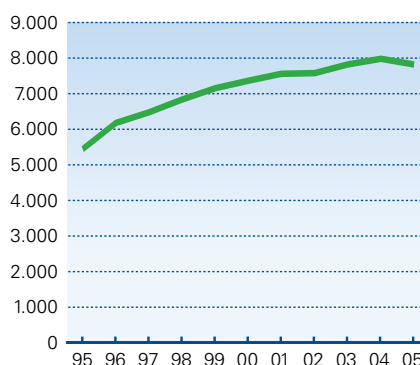
R&D investment in selected OECD countries (R&D spending as % of GDP)



\* Statistics Finland estimate

Source: OECD, Main Science and Technology Indicators, November 2005/ Research and development 2004, Statistics Finland, October 2005

International publications by Finnish researchers in 1995–2005



Source: Institute for Scientific Information, Web of science databases 9 Feb & 22 Feb 2006: SCI (Science Citation Index), SSCI (Social Sciences Citation Index), A&HCI (Arts and Humanities Citation) databases include articles from the fields of natural sciences, medicine and engineering and technology as well as social sciences and the humanities.

# NEW INTERNATIONAL OPENINGS



## 26 bilateral agreements

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In 2005, the Academy had bilateral agreements with 42 partner organisations in 26 countries. Four of these agreements are with new organisations: the Indian Department of Science and Technology (DST) and Department of Biotechnology (DBT), the Russian Foundation for Humanities and the Canadian Institute of Neuroscience, Mental Health and Addiction (INMHA).

The Academy was particularly active in its cooperation with India, China and Russia. Memoranda of understanding were signed with India and the first joint seminar was held. This cooperation will continue in 2006.

The Academy signed an agreement with the Russian Foundation for Humanities and kicked off its cooperation within three research programmes. The Academy also entered into tripartite cooperation with the Russian Foundation for Basic Research (RFBR) and the Russian Foundation for Humanities (RFH) in the context of the Research Programme on Substance Use and Addictions. The Research Programme on Neuroscience is another tripartite venture which in addition to the Academy involves the National Natural Science Foundation of China (NSFC) and the Canadian INMHA. Bilateral agreements provide a solid foundation for international cooperation in research programmes.

The Academy renewed its existing agreements with five organisations: the Academy of Sciences of the Islamic Republic of Iran, the Czech Academy of Sciences, the National Institute of Science and Tech-

nology Policy NISTEP of Japan, the Russian Foundation for Basic Research, and the Slovak Academy of Sciences.

## Cooperation with Japan deepened

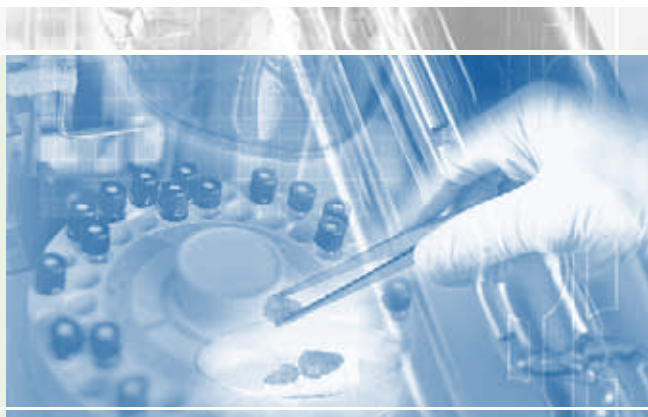
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The Academy continued its active cooperation with the Japan Society for the Promotion of Science (JSPS). Based on the bilateral agreement that was renewed in 2004, the partners decided on the projects that were to be included in the first core programme and organised a Finnish-Japanese nanoscience seminar in Japan. A Finnish regenerative medicine delegation visited high-level Japanese universities and research institutes working in this field.

The core programme is jointly implemented by the Academy and JSPS, and the decision was made to provide funding for two Finnish-Japanese projects for a period of two years. The aim of the programme is to promote long-term and systematic research cooperation and researcher mobility between the two countries and to organise related scientific meetings. The call for applications for the second core programme was announced in autumn 2005, decisions will be made in spring 2006.

In connection with preparations for the Academy's nanoscience research programme, negotiations were held with JSPS on the possibility of joint project funding. Speakers at the JSPS-AF Nanoscience and Nanotechnology Seminar in Tokyo in May included five Finnish and two Japanese nanoscientists. The seminar attracted wide interest in both Finland and Japan.

“Japan, China, India and Russia are strategically important partners in cooperation”



### Funding cooperation between Finland and China

A new kind of funding cooperation got underway between Finland and China. Together with the NSFC and the INMHA, the Academy launched the Research Programme on Neuroscience (NEURO), which is scheduled to run from 2005 to 2009. The programme supports high-level, multidisciplinary research projects in neuroscience in the participating countries as well as researcher mobility and cooperation between those countries.

The NEURO programme involves four Finnish-Chinese and three Finnish-Canadian projects, with each funding agency providing the research funding in the respective countries. A total of 18 Finnish projects were selected to take part in the programme.

Cooperation intensified between the Academy of Finland and the Chinese Academy of Social Sciences (CASS). Helsinki hosted a Finnish-Chinese seminar on intercultural communication. The seminar was attended by a delegation of four from the CASS, leading researchers from Finnish universities and representatives of the Academy. The seminar is expected to provide a platform for new research cooperation between Finland and China.

Jointly funded by the Academy and the NSFC in 2002–2005, the first Finnish-Chinese centre of excellence programme in research ended at year-end 2005. The programme provided funding to support the cooperation of four Finnish centre of excellence teams with leading research groups in China. Experiences from this research and funding cooperation

have been very positive. The Academy and the NSFC are continuing discussions on the start-up of a new programme.

### India a strategic partner in cooperation

The Academy and Indian funding organisations signed two memoranda of agreements for scientific cooperation. Both the DBT and the DST come under the auspices of the Ministry of Science and Technology.

Funding cooperation between Finland and India gives Finnish researchers an opportunity for high-level international cooperation, increases the exposure and appeal of Finnish research and promotes the participation of Finnish researchers in networks of cooperation.

Specific forms of cooperation within the chosen subject area include seminars, researcher mobility, joint evaluations and cooperation between jointly funded research projects and possibly centres of excellence. With the DBT, there is cooperation in such fields as plant, food, environmental and medical biotechnology. The first step in the programme will be to support researcher mobility between Finland and India.

Both countries will be hosting seminars to increase awareness among researchers and research funding agencies of each country's respective areas of expertise. The first joint seminar between the Academy and the DBT, the Indian-Finnish seminar on medical biotechnology, was held in New Delhi, India. Its themes included diagnostics, drug devel-

opment and vaccinations. As a result of this seminar, the Academy and the DBT will be issuing a call for research grants in the field of medical biotechnology in 2006.

### **Cooperation with Russia focused on research programmes**

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The Academy took steps to expand its collaboration with the Russian Foundation for Basic Research (RFBR) and started cooperation with the Russian Foundation for Humanities (RFH). The main focus of this cooperation is on research programmes.

The Academy and the RFBR signed an agreement on the participation of young Russian researchers in international seminars in Finland. Talks were held in Moscow on the start-up of jointly funded research projects. These negotiations led to the signing of an agreement on the launch in 2006 of a joint call in the fields of addiction research and optical materials research. The call will be open to Finnish-Russian research teams so that the Academy provides the funding for Finnish researchers and the RFBR for the Russian partners.

The Academy signed an agreement with the RFH and issued a joint call for research projects concerned with the media in present-day Russia. Encouraged by the experiences, the two parties signed an agreement on joint calls that will be opened in 2006 in two different fields. The first is related to the Academy's new Research Programme on Substance Use and Addictions, the second joint call is aimed at Finnish-Russian projects in the area of business know-how.

### **ERA-NET Scheme networks European research programmes**

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ERA-NET is a networking project aimed at strengthening the cooperation and coordination of national research programmes and projects in different European countries. Most ERA-NET participants are national R&D funding agencies. Ultimately, the aim of this networking is to generate the kind of added value from research that simply cannot be achieved with the current, fragmented research and funding structure.

EU funding is provided to cover the costs of coordination and administration accrued to national funding agencies from their participation in ERA-

NET cooperation. New research cooperation and joint research programmes launched under the ERA-NET umbrella are funded from the research budgets of the participating funding organisations.

The Academy of Finland has responsibility for the coordination of two ERA-NETs: BONUS for the Baltic Sea Science – Network of Funding Agencies, and NORFACE, New Opportunities for Research Funding Co-operation in Europe. In addition, the Academy took part in 13 other ERA-NETs. (A list of ERA-NETs is presented on page 39.)

### **National responsibility for preparation of FP7**

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Charged with the national responsibility for preparation of the EU 7th Framework Programme, the Academy was actively involved in preparing sub-programmes for health research, the environment and climate change and socio-economic sciences and humanities under the EU Specific Programme 'Cooperation'; the Special Programmes 'Ideas' and 'People'; and the components of research infrastructures, research potential, science in society and activities of international cooperation under the Specific Programme 'Capacities'.

In the context of the European Science Foundation (ESF), the Academy's main efforts were concentrated on drafting a new strategy for the ESF. The Academy provided feedback and comment on the ESF's strategic action plan for 2006–2010 and took part in the drafting meetings. The new strategy was adopted at the ESF General Assembly in November.

The Academy contributed to the ESF cooperation of Nordic member organisations and to the development of ESF funding instruments. The persons responsible for ESF matters at the Academy also took part in the administration of the ESF Standing Committees and monitored the progress of cooperation between the COST Secretariat and ESF.

Since the start of NordForsk, the Nordic research cooperation has gained new features. The Vice President (Research) of the Academy acts as Vice Chair of the Board of NordForsk.

### **Obstacles to researcher mobility removed**

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One of the key factors in the internationalisation of research is to promote the mobility of researchers both from and into Finland in such a way that this

fits in with the different stages of the research career. International mobility is an integral and natural part of researcher training. Countries with legislation in place to remove obstacles to researcher mobility are also better placed to create incentives to attract foreign talent into the country and to encourage their own researchers to return.

According to a report by the Academy in 2005 “Mobile minds – Survey of foreign PhD students and researchers in Finland”, the main reasons that attract foreign researchers into Finland are the high quality of research and good research environments. Most of the people coming to Finland to do research are doctoral students or young scholars in the early stages of their research careers.

Conducted with support from the EU, the questionnaire survey collected information from 859 respondents who represented 86 nationalities. Many of the respondents took the view that universities and research institutes should provide information and support services dedicated to the needs of researchers and their families.

Services related to researcher mobility are being developed with EU support in a national mobility network project as part of the European Network of Mobility Centres (ERA-MORE). The project has produced a national researcher mobility portal in collaboration with the University of Helsinki.

The portal provides basic information for researchers either leaving, coming or returning to Finland about research funding, doctoral programmes, research programmes, technology programmes, centres of excellence and Finnish research environments. Practical information is also included about job vacancies, taxation, social security and housing. Links are provided to national and regional researcher mobility services in 29 different countries.

## Research infrastructures

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High-level and up-to-date research infrastructures are crucial to successful research and researcher training. They are also important to the international competitiveness and appeal of the whole research system. Research infrastructures refer to the physical environments and facilities, equipment, information materials, data networks and related services that are necessary for day-to-day research. Examples

include major research equipment, research stations and vessels, collections of research materials, databases, archives, libraries, computing centres and networks as well as research communities that provide technical and expertise services.

At the Commission’s initiative, EU Member States have established the European Strategy Forum on Research Infrastructures (ESFRI). ESFRI brings together representatives appointed by ministries from the respective countries to promote European research infrastructure policy. Finland is represented on the forum by the Academy.

A major focus of cooperation through ESFRI is to make good use of and to develop existing infrastructures as well as to design and create new infrastructures. ESFRI is organised into a number of groups devoted to specific fields of research. Several Finnish researchers are involved in these groups in a capacity of chair or member.

The challenge that lies ahead for ESFRI in the immediate future is to produce an overview of European research infrastructure needs. To this end the forum has set up expert groups in different fields of research. These groups have been charged with the task of identifying future research infrastructure projects that can help to strengthen the European Research Area (ERA) and raise the competitiveness of research. The groups will be reviewing the significance of these projects from the point of view of basic and applied research, the economy and society in general.

The projects dealt with by ESFRI require either major investments at the set-up stage or major overheads, and in most cases they require long-term financial commitments.

ESFRI’s working groups will be completing their first overviews by autumn 2006. This, however, is an ongoing exercise and the overviews will be revised from time to time.

# THE ACADEMY'S ROLE IN SCIENCE FUNDING IN 2005



*Dr Anneli Pauli,  
Vice President  
(Research)*



## Academy research funding

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In 2005, Academy funding for basic research in Finland amounted to 218.7 million euros; the investment in 2004 was 208 million euros.

General research funding was the single biggest category of Academy funding, accounting for 40.8 million euros or 19 per cent of the total, followed by researcher training (17%), international cooperation (13%) and research programmes (8%). Funding for centre of excellence programmes amounted to 27.9 million euros (13%).

Support for high-level Finnish research was also provided in the form of posts for Academy Professor (39 posts) and Academy Research Fellow (247 posts).

Of total funding, 77 per cent was to support research projects and programmes and to finance centres of excellence in research. In 2005, the increase in admission and membership fees for foreign organisations was primarily attributable to the fees paid to the European Southern Observatory (ESO).

In 2005, the Academy received 5,964 funding applications worth 1.2 billion euros; the corresponding amount in 2004 was 930 million euros. Competition for funding among research projects has continued to intensify. In the case of applications for research grants, for example, only 17 per cent received a favourable decision, and funding was just ten per cent of the value of applications received.

Academy funding accounted for some 2,800 person-years in 2005.

All Academy funding decisions are based on scientific evaluations carried out by domestic and international experts. In 2005, the Academy consulted

1,012 experts, of whom 77 per cent were from outside Finland.

## Research programmes provide solid platform for cooperation

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Academy research programmes are aimed at raising the scientific standards of research within the field concerned, developing the field of research or discipline and creating a new scientific tradition or reinforcing the existing tradition and expertise. Research programmes promote multidisciplinary and interdisciplinary research approaches as well as national and international cooperation between researchers, funding agencies and end-users.

Cooperation within research programmes is aimed at supporting meaningful interaction between different actors within the innovation system. For this reason, research programmes are funded and implemented jointly with Tekes and other national funding agencies.

In 2005, the Academy had 14 ongoing research programmes. The term of one programme ended: this was the Proactive Computing Research Programme, a joint Finnish-French undertaking. Preparations were underway for two new four-year programmes, i.e. the Research Programme on Business Know-how (LIIKE2) and the Research Programme on Neuroscience (NEURO). One new programme was launched during the year, i.e. the Research Programme on the Application of Information Technology in Mechanical, Civil and Automation Engineering (KITARA).

The Academy Board decided on the funding of five new research programmes. As well as continuing to work closely with other national organisations, the



“National investment in research has paid off”

*The Academy's annual Science Gala was held at the Old Student House in Helsinki. Actress Sari Sūkander, Academy Research Fellow Tomas Roslin and dancers of Dance Theatre ERI.*



Academy has plans for research programme cooperation with Russian, Canadian and French funding agencies. (A full list of the Academy's research programmes is given on page 39.)

### National centre of excellence programmes in research

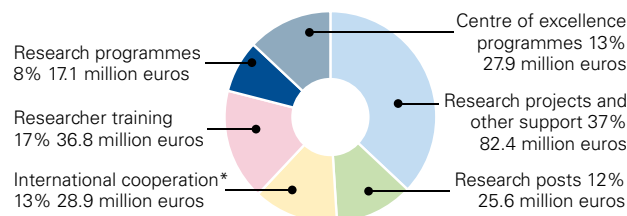
The Board of the Academy appointed 23 centres of excellence to the national centre of excellence programme in 2006–2011. Seven of these units are new centres of excellence, 16 were funded in the first centre of excellence programme in 2000–2005. However, the latter have revised their research plans as well as their operation in many ways.

A total of 143 applicant units were involved in the first round of application in 2004. On the basis of international expert statements and the Academy's science policy decisions, 53 of them went through to the second round. At the second stage the applications were reviewed by international experts, who also made visits to the units.

The heavy investments made in research over the past few years have certainly paid off. Finnish research shows a stronger multidisciplinary orientation than before, it enjoys greater international exposure, it is nationally and internationally better networked and it is also more competitive than before. There are more high-level research groups in the country than ever before, and therefore the task of selecting centres of excellence was even more difficult than in earlier programmes.

In 2006–2008, the Academy will be spending 28.6 million euros to support the third national

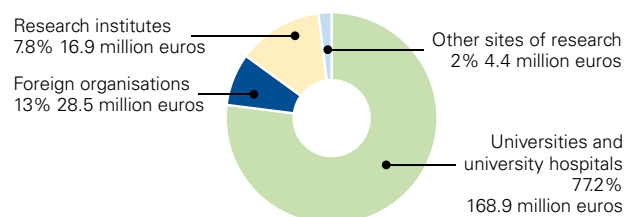
### Academy of Finland research funding decisions by type of funding in 2005



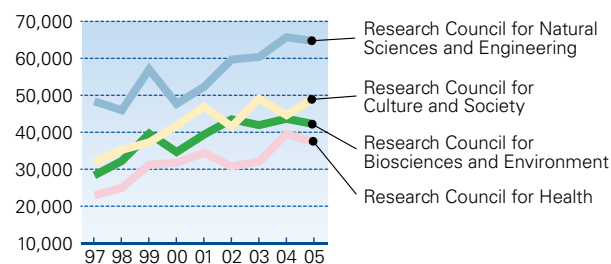
Total 218.7 million euros

\* incl. membership dues to international organisations

### Breakdown of Academy of Finland research funding by site of research in 2005



### Academy of Finland research funding by Research Councils in 1997–2005 (1,000 €)





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

Re-search council	2001			2002			2003			2004			2005		
	Of applica-tions		Of funding applied	Of applica-tions		Of funding applied	Of applica-tions		Of funding applied	Of applica-tions		Of funding applied	Of applica-tions		Of funding applied
	no.	%	%	no.	%	%	no.	%	%	no.	%	%	no.	%	%
BE	46	20	18	40	21	17	40	19	17	37	16	14	29	12	10
CS	42	24	17	46	22	12	60	27	14	46	17	9	47	17	9
NE	105	31	20	104	30	14	116	27	12	88	20	12	82	18	11
H	62	34	16	52	37	15	64	37	15	48	27	15	38	22	11
Total	255	28	18	242	28	15	280	27	14	219	19	12	196	17	10

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

centre of excellence programme. Tekes is contributing 2.0 million and Nokia 0.3 million euros.

The sixteen units funded through the second national centre of excellence programme (2002–2007) continued their work. The funding term for the 26 units and core facilities organisations involved in the first centre of excellence programme ended at the year-end 2005. Preparations were started for the final, international evaluation of the first programme, which will be evaluated simultaneously with the 2002–2007 centre of excellence programme in 2008. (The centres of excellence are listed on page 38.)

Centres of excellence have gained both national and international visibility. In March, the Academy organised a seminar in Brussels to give greater exposure to the national centre of excellence strategy as well as national and Nordic centre of excellence programmes. Special focus was given to the international cooperation of Finnish centres of excellence among others with Chinese high-level researchers. Among the invited guests were representatives of the European Parliament and Commission, personal assistants of Finnish MEPs and EU-R&D liaisons from different Member States.

In September, the Academy hosted a high-level centre of excellence seminar. The purpose was to give a clearer picture of how the centre of excellence concept works and what opportunities it offers, and furthermore to draw attention to the programme's social impacts and its chances of promoting the application of research results. In the seminar discussions it was pointed out that the centre of excellence programmes and national centres of excellence in research have deserved their position and that funding shall be made available to them also in the future.

### Nordic centre of excellence programmes

The third Nordic centre of excellence programme was launched in 2005. Four research networks were selected to take part in the joint Nordic Centre of Excellence Programme in Humanities and Social Sciences in 2005–2010. Each of these networks involves research teams and researchers from at least three different Nordic countries. Finnish researchers are involved in the work of all these centres of excellence. The programme is funded by the Nordic Councils for Research in the Humanities and Social Sciences (NOS-HS) and NordForsk.

An interim evaluation was conducted in 2005 of the Nordic Centre of Excellence Programme in Global Change (2003–2007). This programme is funded by the Joint Committee of the Nordic Natural Science Research Councils (NOS-N) and NordForsk. The four centres of excellence funded through this programme and the Nordic centre of excellence programme concept received excellent feedback from the programme's international scientific support group. On the basis of the interim evaluation the go-ahead was given for the last two years of the centres' funding period. One of the centres of excellence in the programme has a Finnish coordinator, and Finnish research teams are involved in two other units.

The units involved in the Centre of Excellence Programme in Molecular Medicine (2004–2009), which is funded by the Joint Committee of the Nordic Medical Research Councils (NOS-M) and NordForsk, continued their active work and started researcher training programmes. Three units are funded through this programme, one of which has a Finnish coordinator and two of which involve Finnish research teams.



# PROMOTING THE RESEARCHER'S CAREER



<< *Sirpa Jalkanen, Academy Professor and Professor of Immunology at the University of Turku. She received the Anders Jahre Prize 2005.*

< *PhD student Avadora Dumitrescu from Tampere University of Technology*

> *Academy Research Fellow Yrjö Heinonen from the University of Jyväskylä*



## Research cooperation between universities, research institutes and business enterprises

The innovation process is a constant interplay of basic research, applied research and product development. In a knowledge-based economy, it is important that universities, research institutes and business enterprises complement one another as effectively as possible. The amount of intersectoral research cooperation varies widely from one industry and business enterprise to the next. There is a need for a deepening of cooperation and for confidence building.

A working group of the Academy drafted recommendations for the promotion of researcher training and basic research serving the needs of business and industry as well as for the development of cooperation between the Academy and business and industry. The working group submitted its report in early 2005. The working group's aim is to create a new culture of cooperation in which the industrial significance and scientific excellence of the research results would reinforce each other.

A system that allows for the flexible and active movement of research personnel between industry and academia is a key precondition for in-depth and long-term research cooperation. The Academy has created a new form of funding designed to support the intersectoral mobility of PhD researchers at different stages of their research careers.

## Research career strategy

The EU designated 2005 as the European Year of the Researcher with a view to increasing public understanding of the researcher's career and the import-

ance of research to society. During the campaign various events were arranged across the continent. The Academy was closely involved.

It is not the Academy's purpose or mission to provide funding for the biggest part of an individual person's research career. Instead, the Academy offers a range of alternative funding instruments for different stages of the research career, from doctoral students and postdoctoral researchers through to independent and established scholars. For example, the post of Academy Research Fellow is an important stepping stone to a professorship.

The reform of the Academy's funding instruments in 2005 was specifically aimed at developing professional researchers' career opportunities.

The Academy took part in the working group established by the Ministry of Education to produce a draft strategy on how to develop the professional research career and how to make that career option more attractive in light of the growing trends of internationalisation and equality. The working group completed its report in early 2006.

The Academy and Tekes organised their own event as part of the European Researcher's Night, where researchers gave talks and answered questions about the researcher's career. The Academy produced an updated version of its brochure on research careers which was distributed at fairs and science exhibitions.

The Academy was very active in the OECD's expert group Declining interest of science studies among young people.

The Academy adopted a new Equality Plan that is applied to all people in receipt of Academy research funding, researchers occupying Academy



< Academy Research Fellow Tomas Roslin, recipient of the Academy's Recognition Award

> Academy Research Fellow Ilpo Vattulainen, recipient of the Academy's Incentive Award



> Winners of the 2004 Science Competition for Senior Secondary Students, who received their awards in spring 2005 (back left): Satu Simelius, Emmi Mäkinen, Antti Koulu-mies, Vadim Kulikov, Anna Mäkinen and Mirjami Kemppainen and (front left) Heli Kutvonen, Saara Järvinen, Karoliina Nieminen and Alma Yrjö-Koskinen

posts and staff at the Academy's Administration Office. The Equality Plan for 2005–2007 is an important part of the Academy's science policy strategy.

The Equality Plan requires that all decisions on research posts and research funding are made on the basis of an open and transparent expert review where the relative merits of applicants of both sexes are considered in a fair and equal manner. Equality shall be promoted in the spirit of the Act on Equality between Women and Men by preventing discrimination on grounds of gender or other personal reasons and by taking practical steps to improve the position of the minority gender.

### Ongoing efforts to attract top researchers to Finland

The Academy and Tekes created a framework for a joint mechanism within which they will provide funding for fixed-term visiting professorships for leading foreign researchers or top Finnish researchers working abroad. The Finnish Distinguished Professor (FiDiPro) funding programme will help to create and strengthen scientific and technological expertise at the highest level and to attract international researchers to Finland.

The FiDiPro system is incorporated into the Academy's action plan and budget for 2006–2009. It is based on the Government's 2005 decision on central government spending limits for 2006–2009, which gives the Academy additional funding.

### Awards and incentives for researchers

The European Young Investigator Award (EURYI) was granted to 25 young European-based researchers. The grant is worth in excess of one million euros and it is intended for purposes of establishing and building up an own research team. In Finland the grant was awarded to Professor Yrjö Helariutta from the University of Turku and to Professor Päivi Törmä from the University of Jyväskylä.

EURYI was founded by the European Science Foundation and the European Heads of Research Councils EuroHORCs. The Finnish contribution to the funding programme is administered by the Academy.

The Academy of Finland incentive and recognition awards for 2005 were presented at the Academy's Science Gala in November. The Academy's Incentive Award went to Academy Research Fellow Ilpo Vattulainen. His area of study is biological physics, which applies the principles and methods of physics to try and understand complex biological phenomena and to integrate knowledge from the disciplines of chemistry, biosciences and medicine. The results have practical application in the development of methods of drug transfer, for example.

The Academy's Recognition Award was presented to Academy Research Fellow Tomas Roslin, who engages actively in science popularisation. The award is presented each year to a researcher who has significantly contributed to public knowledge and

> First prize of  
the 2004 Science  
Competition for  
Senior Secondary  
Students went to  
Saara Järvinen

understanding of research and the researcher's job, whose work has inspired greater interest in science and who has taken an active part in public discussion and debate.

The European Union's Descartes Prizes are awarded for excellence in scientific research and for excellence in science communication. In 2005, the Research Prize was divided between five research groups. One of the winners was the European Social Survey research programme, which in 2002–2004 received funding worth 486,000 euros through the Academy's Research Council for Culture and Society.

### **Increasing public understanding of science and research**

The Academy's science competition (Viksu) for senior secondary students is intended to inspire interest among young people in science and the researcher's career. Awareness of the Viksu competition was raised by means of advertisements, direct mail campaigns, newspaper articles and visits to 35 senior secondary schools in 15 towns and cities.

In 2005, the winners of the 2004 competition were announced. The first prize was awarded to Saara Järvinen with her entry in the field of literature. Prize money worth 17,000 euros was divided between the ten best entries. A Teacher Prize was awarded to two teachers. In addition, four schools received prizes for active participation and/or achievement in the competition.

In 2005, the Academy received 160 entries from 170 participants. Eight of the entries were by teams of two, one was a group project under the new rules. The entries came from a record number of 52 senior secondary schools.

The Academy's fourth national science review was focused on the field of health research. Aimed at informing the general public and young people in particular about questions of nutrition and health, the Science Weeks 2005 were organised in the form of a national tour that visited Helsinki, Oulu, Vaasa and Joensuu during September and October. The tour consisted of an interactive science exhibition and expert lectures. There were six different exhibition sections, and separate stands where people could learn about the Academy and the science competition for senior secondary students. A total of 37 open discussions were held. The tour involved some 70 people at its different stages.

# HUMAN RESOURCES MANAGEMENT



<< *Training Coordinator  
Karoliina Marttinen*

< *Legal Adviser Eemeli Katila  
(back left), Karoliina Marttinen,  
Personnel Officers Kirsti Törrönen,  
Seppo Heikkilä and (middle left)  
Pirjo Villikka, Department Secretary  
Inkeri Tyynelä, Personnel  
Manager Maarit Saarela and Legal  
Adviser Meri Vannas and (front left)  
Personnel Officer Riitta Hänninen  
and Clerical Officer Eija Petäjäjärvi*

## Staff at the Academy's Administration Office

The Academy of Finland aims to be a good employer and to create a motivating work environment where people can thrive. Key areas of emphasis include staff skills and competencies as well as their working capacity and wellbeing.

At year-end 2005, the Academy's Administration Office had a permanent staff of 168. The number of staff increased by 3.7 per cent, which is less than in previous years. Among the factors that have driven up staff numbers in recent years are the Academy's involvement in the ERA-NET projects under the EU 6th Framework Programme (accounting for 9.5 person-years) and the involvement of Administration Office personnel in the coordination of major research programmes (8.5 person-years).

The mean age of personnel increased slightly to 44.6 years. In order to achieve a more balanced personnel structure, the decision was made in staff recruitment to also take account of the applicants'

gender. At year-end 2005, women accounted for 74 per cent of personnel and men for 26 per cent. The proportion with an academic degree was 63 per cent, of whom 23 per cent had researcher training.

## Developing staff skills and competencies

The accelerating pace of change in the operating environment and its increasing internationalisation present a challenge for staff at the Academy's Administration Office. In 2005, the main emphasis in the development of staff skills and competencies was on support for internationalisation, on improving the skills required in team and project work and high-quality administrative work. A total of 234,000 euros was invested in staff training. Approximately 6.3 working days/person-year and 1,410 euros per person-year were devoted to training.

Training programmes were started at units with a view to developing teamworking and improving the quality and efficiency of operations. Regular informa-



< *Legal Adviser  
Eemeli Katila*

> *Communications  
Specialist Terhi  
Loukainen (left)  
and Secretary  
Trainee Asta  
Karjalainen*





< *Communications Specialist Pasi Ripatti*

> *Kaisa Kononen, Programme Manager, BONUS ERA-NET (left), Science Adviser Johanna Inkinen and Project Secretary Hanna Kunnari*



tion meetings were held in different thematic areas to improve the transfer of internal knowledge and best practices.

Language and cultural training was provided for staff members. Staff skills were strengthened not only through regular training courses, but also through personnel exchange schemes mainly with foreign organisations like NSF and ESF. New guidelines were also adopted for induction training.

### Supporting welfare in the workplace

The main focus of efforts to support welfare in the workplace was on preventive measures and actions to promote working capacity. Data from the biannual welfare barometer provide a key source of information for planning purposes. On average, the results from the barometer questionnaire at the Academy in 2005 were at the same level as the reference data.

It was particularly pleasing that job satisfaction and commitment among staff members had con-

tinued to improve. On the other hand, an increased workload was identified as the main problem for staff. The results of the barometer were analysed in all units with support from Medivire, an outside specialist in occupational health. Development planning for 2006–2007 was started among supervisors, in the welfare in the workplace group and occupational health services.

Work to promote welfare in the workplace is a concerted effort with occupational health services. A total of 44,000 euros was invested in this work, or 265 euros per person-year. A good working environment depends upon ergonomically sound workstations as well as comfortable and pleasant facilities. Supervised exercise groups were organised on a regular basis, and various recreational, culture and sports events were arranged. Furthermore, ergonomic checks were carried out on all workstations, and a special programme was set up to monitor and analyse the quality of indoor air. Both of these programmes will be continued in 2006.



<< *Clerical Officer Taina Alameri*

< *Finance Officer Paula Pesola*

> *Assistants to Academy Management Irmeli Rautiainen (back left), Päivi Kulo and Anja Raatikainen (back right)*



## RESEARCH COUNCIL FOR BIOSCIENCES AND ENVIRONMENT IN 2005: AIMING FOR THE RIGHT QUALITY AND VISIBILITY OF RESEARCH

The Research Council for Biosciences and Environment has set itself the target of ensuring that biosciences and environmental research in Finland is of a high standard and enjoys high visibility. Research in the disciplines under the Council's purview is expected to show impact, innovation and internationalisation. There is a demand in society for competent research with a real capacity for renewal and regeneration. The impact of this research is further reinforced by its diversity and internationalism.

ures are in place for the international evaluation of research grant and research post applications received, and this guarantees that the highest-quality projects will continue to receive funding in the future.

The Council has had a pioneering role in the internationalisation of evaluation. In 2005, foreign experts were used in close to 100 per cent of all evaluations. The reviewers came from 25 different countries.

The Council carried out a discipline assessment of research on food sciences and related research on



*BIREME Research Programme:*

<< Professor Markku Viitasalo

< Professor Erkki Leppäkoski

> Academy Professor Kaarina Sivonen

>> Senior Curator Risto Väinölä



Funding decisions announced by the Research Council in 2005 amounted to more than 42 million euros. These decisions reflected the wide range of disciplines hosted by the Council and the drive to recognize and support innovation. Competition was particularly intense for general research grants: only less than 12 per cent of applicants were funded. A total of 9.25 million euros was awarded in general research grants to projects running for three to four years.

The Council promoted research careers by providing funding for 34 individual postdoctoral researchers and for the hiring of 12 postdoctoral researchers in research teams; 14 Academy Research Fellows; and ten Senior Scientists. There are nine Academy Professors and 13 doctoral programmes in the Research Council's disciplines.

### A year of impact and evaluations

According to reviews of the state and quality of research conducted by the Council, the scientific impact of the disciplines that come under its purview has developed favourably during the 1990s. Sound proced-

nutrition and consumption. This field involves a number of disciplines and therefore it was both necessary and natural, in the planning as well as the implementation stage of the assessment, to have broadly-based cooperation among funding agencies and other actors. The assessment was conducted jointly with other Academy Research Councils, the National Technology Agency Tekes, the Finnish National Fund for Research and Development Sitra, the Ministry of Agriculture and Forestry and the Finnish Food and Drink Industries' Federation.

The Council conducted its own assessments of the impact of Academy research funding. Component projects considered the significance of Academy funding to food research, the impact of general research grants in environmental research, the impact of research conducted in research programme projects and the significance of international cooperation through ESF programme activities to Finnish researchers' careers. The findings suggest that Academy funding instruments have broad-ranging impacts on the development of science and the application of its results in society.

### In search of active programme interaction

The Council has main responsibility for three ongoing Academy research programmes: the Baltic Sea Research Programme (BIREME 2003–2005), Wood Material Science Programme (2003–2006) and the Research Programme on Environmental, Societal and Health Effects of Genetically Modified Organisms (ESGEMO 2004–2007). They all showed great activity, gaining exposure to their work through seminars, workshops, newspaper articles, science

evaluation of the applications was organised by the Academy. Twenty-five research projects were selected to take part in the programme, three of which are collaborative efforts between Finland and Canada and four between Finland and China. The Academy has allocated 7.2 million euros for the programme.

### Working to create a strong Europe

The Council continued to take an active role in European research cooperation, particularly so



“The Council is a pioneer in the internationalisation of evaluation”



breakfasts and other similar events. Attention was also given to different forms of social impact and to active interaction between the actors involved.

The BIREME programme organised two workshops specifically aimed at young researchers: “How Does Research Knowledge Become Part of Decision-making” and “Scientific Communication”. Participants in the midway seminar of the ESGEMO programme discussed questions of media exposure and worked on creating closer links between research results and their practical application. One of the final products of the Research Programme on the Sustainable Use of Natural Resources (SUNARE), which ended in 2004, was an online book published under the title “Sustainable Use of Renewable Natural Resources – From Principles to Practices”.

The Council worked closely with other Academy Research Councils on preparations for the international Research Programme on Neuroscience (NEURO 2006–2009). This programme will be jointly funded by the National Natural Science Foundation of China and the Institute of Neuroscience, Mental Health and Addiction from Canada. The scientific

in ERA-NET projects. The Council is involved in seven ERA-NETs; for one of them (BONUS for the Baltic Sea Science – Network of Funding Agencies) it is the coordinator.

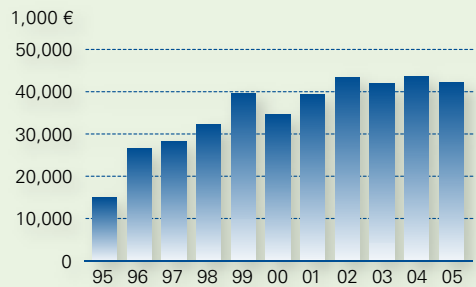
BONUS prepared a joint Baltic Sea research programme and had discussions with the European Commission on the possibility of funding the programme under Article 169 of the EU Treaty. The scientific content of the programme was outlined by reviewing earlier research in the Baltic Sea countries as well as its funding. Extensive background material was compiled on the focal areas of research. This material was discussed at researcher workshops in all Baltic Sea countries. The Council was also actively involved in the work of MarinERA, an ERA-NET project that coordinates European marine research.

The ERA-NET Plant Genomics (ERA-PG) progressed to the opening of a joint European research programme. The Council has decided to take part in the programme by providing funding for high-level Finnish research projects involved in European plant genomics consortia. In addition, the Council has decided to take part in the ERA-



< Academy Professor Ilkka Hanski, Centre of Excellence in Metapopulation Research

Funding decisions in 1995–2005



PathoGenoMics call by funding Finnish research groups together with the Research Council for Health.

WoodWisdom-Net, the forestry and wood sector ERA-NET, prepared a call for a joint research programme that will be issued in 2007. The search for themes for the research programme used a computer-aided method, which produced more than 300 initiatives. Work to sieve through these potential research themes will continue in 2006. The Academy compiled information on evaluations carried out in different countries and produced a summary that will be used in assessing the projects taking part in the joint programme.

The pilot stage of ERA-NET CIRCLE, which integrates climate change research, received Commission funding for a four-year extension. At the same time, new European partners joined the project. Focusing on the ethical aspects of genome research, ERA-Sage was started up.

The Research Council took part in preparing the EU Seventh Framework Programme (FP7), giving a voice to Finnish researchers' views on what should be included in FP7 and its Specific Programmes. Among the thematic priorities of FP7, those that touch most closely on the Council's areas of interest are the environment, including climate change, food, agriculture and biotechnology. The national hearing in preparation of the Technology Platform on Plant Genomics, which is an integral part of the framework programme, was organised together with the Plant Genomics Project Programme. Several representatives of both research and industry took part in the hearing.

Jointly funded by ESF member organisations, EUROCORES programmes have got off to a flying start. The Council provided funding for three Finnish projects in the Science of Protein Production (Euro-

SCOPE) programme and in this way secured the programme's presence in Europe. In the Challenges of Biodiversity Science (EuroDIVERSITY) programme, Finnish researchers were involved in projects that received a successful review.

The Council contributed to Nordic cooperation by performing the Secretariat's functions for the Joint Committee of the Nordic Natural Science Research Councils (NOS-N) and by planning and implementing the final evaluation of the Nordic Data Grid Facility pilot programme. Furthermore, it was involved in preparing and implementing a new joint Nordic research programme (Nordunet3) and actively monitored the work of NordForsk.

### 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

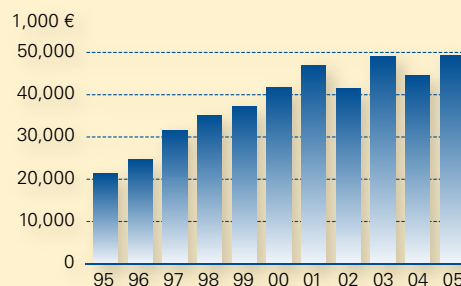


## RESEARCH COUNCIL FOR CULTURE AND SOCIETY IN 2005: GROWING FOCUS ON IMPACT OF RESEARCH



*Research Director  
Tarja Väyrynen,  
Communities in  
Transition –  
Managing Identity  
Conflicts Project*

Funding decisions in 1995–2005



The Research Council for Culture and Society supports research and researcher training in the disciplines under its purview. By means of research funding, the Council aims to raise the quality of Finnish research, to increase its national and international visibility and to raise its esteem. As in other fields, the key focus of research policy in the humanities and social sciences has increasingly shifted to the question of impact.

The Council promotes the internationalisation of science both by means of research funding and by seeking more diversified international cooperation. In the assessment and review of project proposals submitted to the Council, it relies increasingly on foreign experts. In some types of funding they now account for more than 60 per cent of reviewers.

Competition for Council funding is fierce. Since there usually are no other external sources of funding besides the Academy for research in the humanities and social sciences, the Council considers it important that the size of projects be increased so that the project could be carried through with the funding granted. The number of applications received in the May call for open project funding has increased in recent years.

Academy Fellowships are of key significance in promoting professional research careers in the disciplines hosted by the Council. Competition for these posts remains extremely intense: the Council has been able to grant five-year posts to only one in ten applicants.

### Closer international cooperation

Launched with EU funding in 2004, NORFACE is an ERA-NET partnership of national social science research councils. The Research Council for Culture and Society is a member of the partnership and responsible for its implementation in Finland. Finland also serves as coordinator of NORFACE.

During 2005, five new countries joined the partnership, bringing the number of national research councils involved to twelve. NORFACE also issued a call for applications based on common-pot funding. Funding was granted to two series of seminars, one of which dealt with security issues and the other with science policy. NORFACE prepared a research programme that will be implemented with joint funding.

The corresponding ERA-NET partnership in the humanities – Humanities in the European Research Area (HERA) – was launched. The Academy of Finland is a member in the Dutch-coordinated project that involves 14 countries as well as the European Science Foundation (ESF). Finland was charged with the task of drafting five thematic reports, which will be compiled on the following subjects: From Past to Future; The Creation of Europe on the Basis of Different Cultural Heritages and National Identities; Values, Beliefs and Ideologies as Forces of Change in Europe; Understanding and Misunderstanding; Cognition, Mind and Culture; The Humanities as Source of Creativity and Innovation; and The Human Factor in Technology, Globalisation and Environmental Issues. The theme chosen for the HERA conference to be hosted by Finland in autumn 2006 deals with the role of the humanities in foresight exercises.



“Impact within cultural and social science research cannot be assessed and measured with any single set of criteria”



The European Social Survey is a project jointly funded by the EU, the ESF and national research funding agencies. The survey is aimed at gathering comparative information from different European countries on public attitudes and values. The Council has provided funding for purposes of data collection in Finland since 2001. In 2005 the Council decided on its participation in the third phase of the programme.

The Council funded five ESF scientific programmes and a number of EUROCORES programmes. There were two new start-ups, Histories from the North – Environments, Movements, Narratives (BOREAS) and Consciousness in a Natural and Cultural Context (CNCC).

Cooperation with Chinese science organisations continued to gather pace. The Research Council for Culture and Society and the Chinese Academy of Social Sciences organised their first joint seminar on the theme on intercultural communication in Helsinki. One concrete theme that emerged for future collaboration was that of business communication.

The centre of excellence programme jointly funded by the Nordic Councils for Research in the Humanities and Social Sciences (NOS-HS) got underway. Four centres of excellence are funded under this programme, all of which involve research teams from Finland.

The Council has contributed to the work of the Nordic Board for Periodicals in the Humanities and Social Sciences (NOP-HS) and through NOP-HS provided funding for Nordic publications. NOP-HS has already for several years supported electronic publishing. A key development goal for the future is to facilitate electronic publishing at a Nordic level.

### Growing internationalisation in research programmes

Research programmes are excellent vehicles for promoting international cooperation, which in turn is crucial to ensuring multidisciplinary approaches to research. International cooperation also makes it possible to sustain larger research groups. Internationalisation of the research environment is a basic consideration and target for research programmes from the very outset.

The Council launched the Research Programme on Business Know-how. The programme will be addressing different aspects of business know-how, which is considered crucial to the success of the Finnish economy: how do Finnish companies and companies operating in Finland improve competitiveness through their own operation? Funding is provided to ten individual projects and two consortia. The programme has plans for international cooperation with Russia, for example.

International funding cooperation within the Russia in Flux Research Programme that was launched in 2004 received a major boost with the opening of a joint call for applications with the Russian Foundation for Humanities. Applications were invited on the theme of Russian media.

The Council worked on preparations for the multidisciplinary Research Programme on Substance Use and Addictions. Substance use is considered to represent one of the main current threats to the health and safety of people in Finland. Key themes of the research programme include changes in the alcohol macroenvironment, socio-economic differences in



*Industrial Design  
Research Programme:*

*<<< Project Manager  
Pertti Aula*

*<< Researcher  
Petra Falin*

*< Professor  
Minna Uotila*



drinking habits and related harms, substance use, harms and drug policy, research into addiction behaviour and addiction mechanisms.

At the preparation stage for the Research Programme on Substance Use and Addictions, one of the key aims was to gain as broad an overview as possible of European and global cooperation in the field. The Council organised an information seminar in Brussels which was attended by participants from 14 different countries. As a result of several rounds of negotiations, the programme will be organised in collaboration with the Canadian Institute of Neuroscience, Mental Health and Addiction (INMHA), the Russian Foundation for Basic Research (RFBR) and the Russian Foundation for Humanities (RFH). It is possible that other funding agencies will contribute at later stages of the programme.

The Council hosted an exploratory workshop with a view to preparing and identifying relevant themes for the Power in Finland Research Programme. Almost 200 researchers and policy-makers took part. The call for applications will open in 2006. The programme will include five different themes to encourage different approaches to studying phenomena of power, including the media and power, gender and power, and economy and power. Discussions have been held at the preparatory stage on the possibility of cooperation with the other Nordic countries.

### **The challenges of measuring impact**

The Council hosted several discussion forums on the measurement and definition of impact of

research with a view to contributing to the ongoing science policy debate and at the same time to the Academy's own impact project.

In the field of cultural and social science research, impact is a highly complex and multifaceted phenomenon that does not lend itself to straightforward measurements. The concept of impact is itself surrounded by ambiguity, and the measurement of impact within cultural and social science research cannot rely on any single set of criteria. In the Council's view, therefore, it is important that there is broad debate and discussion so that a more in-depth content can be worked out for the concept of impact. This will help to uncover not only short-term and often marginal impacts, but also longer-term, genuine impact paths.

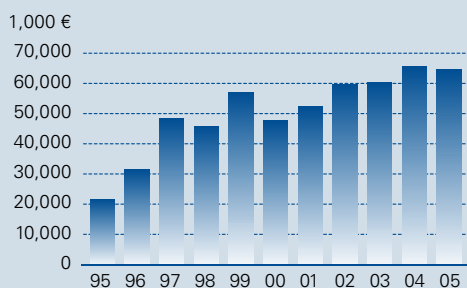
### **Fields of research hosted by the Research Council for Culture and Society**

- 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

# RESEARCH COUNCIL FOR NATURAL SCIENCES AND ENGINEERING IN 2005: EMPHASIS ON NEW AND INNOVATIVE RESEARCH OPENINGS



Funding decisions in 1995–2005



In 2005, the Research Council for Natural Sciences and Engineering devoted special effort to developing its review procedures, to identifying and supporting new, innovative research openings and to stepping up international cooperation. In the planning and preparation of research programmes, the Council worked closely with the research community, other research funding agencies and business and industry.

The Council allocated a significant proportion of its funding to general research grants, which amounted to 14.2 million euros divided among 82 projects. In order to strengthen the regeneration of research, the Council gave special attention in its funding decisions to expert assessments on the project proposals' innovativeness and scientific novelty value. Long-term funding decisions were made with a particular view to securing the continuity of scientifically ambitious projects. The majority, i.e. 90 per cent of the projects funded, were scheduled for three or four years. About one in six applicants could be funded, which was the equivalent of about eleven per cent of the total sum applied for. The average amount of funding decisions was 173,000 euros.

The Council supported new and growing fields and disciplines that are emerging with scientific progress primarily by means of targeted forms of research grants and funding. Additional funding worth around 1.5 million euros was made available in order to strengthen basic research in modelling and simulation. Furthermore, the Council decided on the allocation of funding in 2006 to research in remote sensing and geoinformatics (including navigation and positioning) together with the Research Council for Biosciences and Environment and the National Technology Agency Tekes.

## Academy-funded research has produced sound scientific results

The scientific impact of Academy-funded projects was evaluated among other things by citations of publications and theses produced within these projects and on the basis of data from research reports. On average, Academy projects published 30 articles in refereed international journals per one million euros, while in the case of university research the corresponding figure for the natural sciences in 2004 was 9.9 articles per one million euros and for engineering sciences 3.7 articles (source: KOTA database).

One million euros of Academy funding produced on average four PhDs, two Licentiate's degrees and five Master's degrees. At universities, the corresponding figure for the natural sciences was 1.2 PhDs and for engineering sciences 0.6 PhDs per one million euros of funding (source: KOTA database). The comparisons were based on funding decisions for general research grants by the Council in 1995–2000.

Research funded by the Council is typically of an interdisciplinary, basic research nature. At the same time, though, it is often very close to practical applications. Within 1.5–5.5 years of the ending of funding, more than one-half of the projects included in the review had produced commercial or industrial applications based on their research results. Up to 80 per cent of the project leaders expected that the results of their research would be put to practical use in business and industry within the next year or ten years. About 45 per cent of the project leaders regarded the results as extremely important or important in terms of industrial applications in the field.

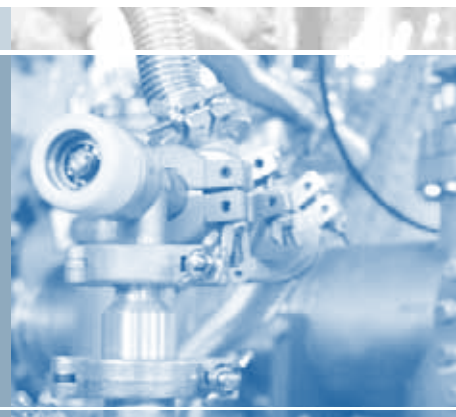
< Academy Professor  
Mikko Sams, PROACT  
Research Programme

<< Researcher Laura  
Kaubanen, PROACT

> Professor Juba  
Åystö, Nuclear and  
Condensed Matter  
Physics Programme



“Results of research  
will be put to practical  
use in business and  
industry within the  
next ten years”



Ecological issues and nature conservation were among other aspects considered in the assessment of the social impacts of research. The questionnaire survey included projects that had received open research grants in 1997 and 1998 in the fields of electronics and electrical engineering, mechanical engineering and manufacturing technology, materials and process technology, construction and municipal engineering and information processing sciences, as well as the projects contributing to two research programmes, Electronic Materials and Microsystems (EMMA, 1999–2002) and Future Mechanical Engineering (TUKEVA, 2000–2003).

### Research programmes help to bolster strategic areas

The Research Programme on the Application of Information Technology in Mechanical, Civil and Automation Engineering (KITARA, 2005–2009) was launched in 2005 in collaboration with the Ministry of the Environment and Tekes. The aim of the programme is to strengthen basic research in mechanical and civil engineering by making use of ICTs in these fields. Furthermore, the Council is keen to support the creation of new multidisciplinary research teams as well as national and international networks. The Academy accounts for around 5.6 million of the programme's budget of eight million euros; Tekes will be contributing two million euros and the Ministry of the Environment 0.4 million euros. A total of 15 consortia are involved in the programme.

In response to a Council initiative, the Acad-

emy's Board decided in 2005 to grant the Council authority to conduct negotiations to continue preparations for the Research Programme on Nanoscience FinNano and the Research Programme on Sustainable Production and Products (KETJU) and to launch the programmes in 2006.

### Assessments for science policy work

The Council decided to carry out three discipline assessments in the engineering field to support its strategic work. The assessment of energy technology was started up in late 2005. The purpose is to gauge the scientific quality of research in energy technology and closely related fields and to evaluate its training and education structure. The steering group for the discipline assessment includes representatives of the Ministry of Trade and Industry, Tekes, the Finnish Energy Industries Federation Finergy and business enterprises. The assessment proper will be conducted by an international panel of experts during 2006. The results will be used in preparing the research programme for the energy sector. Plans are in place to conduct a similar discipline assessment in the fields of information technology and automation and mechanical engineering during 2007–2008.

The Council launched an evaluation of Finnish Antarctic research in collaboration with the Research Council for Biosciences and Environment and the Antarctic Coordination Group. The evaluation is focused on the Antarctic research projects that were started with Academy funding in 1998–2005. The evaluation also covers the Antarctic



< Professor  
Samuel Kaski,  
PROACT Research  
Programme,  
Research project  
Prima

>> Professor Petri  
Myllymäki, Prima



research projects of the Geological Survey of Finland and the Finnish Geodetic Institute, which have received Antarctic Logistics support during this period. The Logistics Secretariat operating in conjunction with the Finnish Institute of Marine Research will also be evaluated.

### International cooperation

The current agreement on the European Incoherent Scatter Facility (EISCAT) in northern Norway expires at the end of 2006. During the year under review the Chair of the Research Council signed an agreement for an extension to Finland's EISCAT membership.

The Council also had talks about its agreements with the Nordic Optical Telescope Scientific Association and NORDSYNCR, the Nordic partner to the European Synchrotron Radiation Facility (ESRF), but decisions on any changes in Finnish membership contributions were postponed.

The Council took active part in Nordic cooperation. The Chair of the Council also served as Chair of the Joint Committee of the Nordic Natural Science Research Councils (NOS-N). The Council is involved in the Joint Nordic Internet Research Programme (Nordunet3) that will be starting up in 2006 at the initiative of NOS-N. The call for applications was conducted in late 2005. Based on the results of the Data Grid project that was funded jointly with Sweden, Norway and Denmark in 2003–2005, the Council decided to recommend the establishment of a Nordic Data Grid Centre for 2006–2011.

The Council participated in the EUROCORES programme Smart Structural Systems Technologies

(S3T) that was set up by the ESF Standing Committee for Physical and Engineering Sciences (PESC) as well as in five ESF scientific programmes aimed at promoting partnerships among researchers and research teams. Furthermore, the Council was involved in a multinational research programme prepared by the ERA-NET ERA-Chemistry.

The Council decided to contribute to the cooperation between the American National Science Foundation and European funding agencies, which is geared to supporting US-European research cooperation in basic research in materials science and engineering. The Council has earmarked 0.5 million euros for purposes of supporting Finnish projects.

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

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

## RESEARCH COUNCIL FOR HEALTH IN 2005:

# WORKING TO MAINTAIN THE DIVERSITY OF RESEARCH

“Finnish research in biomedicine is of an internationally high standard”

> MICMAN, the Microbes and Man Research Programme: Researcher Yaofeng Zhao (left), Secretary Naradja Wissmar and Researcher Alexej Schmidt



Clinical research is one of the areas supported by the Research Council for Health; around one in four applications are for clinical research. In recent years, however, the number of clinical researchers has been on the decline, especially so among younger scientists. The time-consuming requirements of specialisation and the work involved with patients make the choice of a clinical research career particularly challenging.

The Council has been working closely with university hospitals and the Finnish Medical Society Duodecim to try and find new ways of solving the problems of clinical research and the clinical research career. These efforts have led to the creation of a funding mechanism which allows for clinical research on a part-time basis.

The Council provides support both for young doctors in training for clinical specialisation and for senior clinical researchers who are more advanced in their work. This new method of supporting clinical research careers was introduced in September at a seminar jointly hosted by the Research Council for Health and Duodecim on the challenges facing clinical researchers.

The Council's cooperation with other Academy Research Councils in research programmes is crucial to supporting health research on a broad basis. During the year under review the Academy's Research Councils joined forces to launch the Research Programme on Neuroscience (NEURO, 2005–2009), which provides funding for a broad range of research on the structure and function of the nervous system from molecular biology through clinical neurosciences to neurotechnology and neurophilosophy. The NEURO programme also involves two inter-

national funding agencies, viz. the National Natural Science Foundation of China and the Canadian Institute of Neuroscience, Mental Health and Addiction.

The Council also worked on preparing new research programmes: Substance Use and Addictions; Chemical, Physical and Biological Nanoscience; Work, Welfare and the Challenges of the 2000s; and Nutrition, Food and Health. It also planned a broadly-based multidisciplinary research programme on major diseases of public health importance in Finland, which will be conducted in collaboration with other Academy Research Councils and possibly other national and international funding agencies.

### Assessments shed light on strengths and weaknesses

Discipline assessments provide important information on the strengths, weaknesses and possible areas requiring development within the discipline concerned. In targeting funding for research in nursing science, the Council took account of the recommendations submitted in the 2003 assessment of this discipline. Nursing science is one of the smaller disciplines among those that come under the Council's purview, and it is particularly important to monitor and raise scientific standards in these fields with a view to maintaining the diversity of research.

Funding allocations were made to strengthen Finnish research in nursing science and its social significance, to support researcher training in this field and to promote national and international networking. The Council awarded a total of around 0.6 million euros to four nursing science projects. The review panel observed that the recommendations of the

discipline assessments had been taken onboard in designing the research projects: the applications incorporated a more diverse range of research methods and there were also more plans for cooperation.

The Council also awarded a total of 0.6 million euros to four projects in the field of integrative physiology. As well as helping researchers gain a better understanding of the physiology of the human organism as a whole, this funding is expected to boost efforts to develop new approaches to the pathophysiology of human diseases.

The Council conducted the final evaluation of the Health Promotion Research Programme (TERVE 2001–2004). This programme was aimed at finding

momentum in recent years and is no longer in need of special support measures. With respect to researcher training, however, there was a need to clarify the options available, particularly after the PhD. According to the impact assessment, the TERO programme produced valuable information on the effects of the recession, and some of the projects have in fact directly shaped social and health policies. However, the programme had not produced the kind of information that would have helped to reduce health and other welfare differences between population groups. Researchers who had received funding for researcher training abroad thought that their postdoctoral spell had been significant to their career.



*The Nordic Centres of Excellence in Molecular Medicine, Wired, Professor Anita Aperia, and her research team*

ways and developing methods for promoting the health and welfare of people in Finland and to encourage closer interaction in this field of research. The experts who evaluated the programme described it as a significant contribution and praised both the scientific quality and the quantity of the projects. However, the panel would have wanted to see longer-term and more substantial funding for the programme.

The Council took part in the Academy-funded project to assess the impact of research by looking at the impact of its own funding activities from three different perspectives: it conducted an evaluation of the measures taken to develop researcher training in the field of psychiatry, an assessment of the social impacts of the research programme on the Health and Other Welfare Differences between Population Groups (TERO 1998–2000), and an evaluation of the impacts of funding for researcher training abroad.

According to the evaluation of researcher training in psychiatry, research in psychiatry has gained

### Staying at the international cutting edge

Finnish research in biomedicine is of an internationally high standard, which is seen for instance in the good success that Finnish researchers enjoyed with their submissions to the EU 6th Framework Programme. Finnish researchers are involved in almost one in four FP6 projects in the biotechnologies sector of health research. Total funding for these Finnish projects through the framework programme amounts to approx. 47 million euros.

The Finnish researchers funded through the framework programme have also enjoyed excellent success in the competition for Academy funding: four in five researchers in receipt of EU funding have also applied for and received funding from the Academy in the 2000s.

The Council promoted the international cooperation of researchers among other things by taking advantage of the Academy's bilateral international agree-



ments and by participating in the ERA-NET projects of European funding agencies. The Council takes the view that the impetus for cooperation between funding bodies should come from genuine contacts among researchers.

The Council took part in researcher visits to China, India and Japan in order to assess the prospects for funding cooperation and for partnerships between Finnish researchers and their colleagues in these countries.

The visit to China led to the start-up of the NEURO programme on a multinational basis. As a result of the visit to India, the Research Council for Health and the Indian Department of Biotechnology



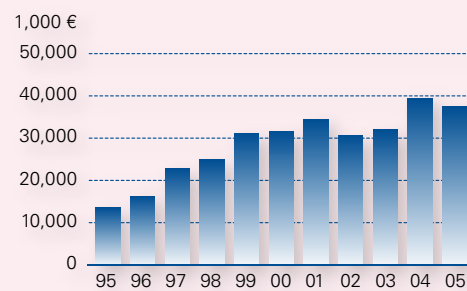
(DBT), signed an agreement on funding cooperation in the fields of vaccination development, diagnostics and computational methods in drug development. The visit to Japan convinced both Japanese and Finnish researchers that there is real scope for cooperation in stem cell research as well as in the field of regenerative medicine. The Council is looking to open funding cooperation with a Japanese funding agency, the Japan Society for the Promotion of Science.

Funding cooperation with other EU members is being tried out in the context of ERA-NET projects in three different fields. Research funding will first be offered in ERA-PathoGenoMics, a joint microbiology project involving ten European countries. In 2005 the participants reached agreement on the details of the joint call for applications that will be sent out to researchers. Preparations are also underway for collaboration in the ERA-AGE project (ageing research) and in the ERASysBio project (systems biology).

### Council on a charm offensive at universities

Visits to universities have always been an important channel of contact for the Council. During the year under review the Council toured six universities that engage in research and education within its fields to talk about the reform of the Academy's funding instruments and about its own initiatives. These initiatives attracted much interest and discussion: grants for clinical researchers, cooperation with the DBT, funding allocated to research into the effectiveness of diagnostics and the new Academy programme for visiting professors, the Finland Distinguished Professor Programme (FiDiPro).

Funding decisions in 1995–2005



### 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
- and 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 2003–2005 BY FIELD OF RESEARCH\*

Field of research	2005	%	2004	%	2003	%
<b>Natural sciences</b>	<b>103,032,060</b>	<b>47</b>	<b>91,136,890</b>	<b>44</b>	<b>78,637,267</b>	<b>44</b>
Space research and astronomy**	15,956,960		3,161,010		2,493,090	
Biology, environmental sciences	32,553,120		32,863,330		31,698,010	
Physics***	24,145,320		22,464,420		22,867,477	
Geosciences, meteorology	2,458,430		5,279,330		1,899,490	
Chemistry	8,762,350		9,953,800		5,493,540	
Geography	961,540		1,410,620		1,455,540	
Mathematics	5,931,520		6,282,360		5,077,990	
Information processing science	12,262,820		9,722,020		7,652,130	
<b>Engineering</b>	<b>16,635,620</b>	<b>8</b>	<b>22,786,910</b>	<b>11</b>	<b>15,444,120</b>	<b>8</b>
Architecture	207,610		413,220		107,440	
Biotechnology and food engineering	1,507,280		2,295,360		682,980	
Energy technology	31,280		101,590		26,430	
Mechanical engineering	3,086,830		1,837,820		1,247,790	
Metallurgy and extractive engineering			394,750		121,810	
Other engineering	288,450		184,720		636,850	
Process and materials technology	3,410,500		3,942,270		2,055,470	
Wood processing technology			371,250		21,220	
Construction engineering, community planning and municipal engineering	1,896,920		1,347,030		549,580	
Electronical engineering	6,206,750		9,547,960		8,290,000	
Chemical engineering and chemical process technology			2,350,940		1,704,550	
<b>Medicine and health sciences</b>	<b>42,214,876</b>	<b>19</b>	<b>43,999,580</b>	<b>21</b>	<b>32,158,470</b>	<b>17</b>
Medicine and nursing science			1,590		-	
Biomedicine	20,311,836		26,675,480		14,849,300	
Veterinary medicine	712,260		719,060		176,720	
Pharmacy	2,262,670		2,625,400		693,920	
Dental science	550,110		816,760		1,017,320	
Nursing science	615,700		195,190		299,760	
Public health science	3,569,710		4,142,420		7,950,750	
Clinical medicine	13,294,170		7,692,450		6,541,650	
Sports sciences	128,000		574,220		169,410	
Nutrition science	770,420		557,010		459,640	
<b>Agriculture and forestry</b>	<b>5,156,960</b>	<b>2</b>	<b>2,720,070</b>	<b>1</b>	<b>7,823,540</b>	<b>4</b>
Agricultural sciences, food sciences	2,339,590		438,850		3,822,990	
Forest sciences	2,817,370		2,281,220		4,000,550	
<b>Social sciences</b>	<b>31,627,221</b>	<b>15</b>	<b>28,696,120</b>	<b>14</b>	<b>29,637,516</b>	<b>16</b>
Economics	2,018,640		1,562,600		2,526,610	
Education	3,087,771		1,691,830		2,709,050	
Business economics, economic geography	5,675,880		3,005,690		3,336,190	
Law	1,862,730		3,262,860		3,170,860	
Psychology	6,228,190		5,655,360		3,205,610	
Social science	6,975,430		8,299,070		9,667,392	
Statistics	404,400		54,780		147,934	
Political science and administration	3,178,850		2,351,430		3,750,580	
Communication, library science and information science	2,195,330		2,812,500		1,123,290	
<b>Humanities</b>	<b>19,836,223</b>	<b>9</b>	<b>18,574,877</b>	<b>9</b>	<b>20,736,480</b>	<b>11</b>
Philosophy	3,950,800		2,489,197		3,103,920	
History and archaeology	4,316,550		3,755,370		4,331,460	
Philology and linguistics	5,210,913		3,646,150		4,463,200	
Cultures research	2,874,650		1,863,140		2,200,440	
Aesthetic fields research and literature	1,880,620		3,976,230		4,608,990	
Theology	1,602,690		2,844,790		2,028,470	
<b>Others</b>	<b>200,000</b>	<b>0</b>	<b>50,000</b>	<b>0</b>		
<b>Total</b>	<b>218,702,960</b>	<b>100</b>	<b>207,964,447</b>	<b>100</b>	<b>184,437,393</b>	<b>100</b>

\* The figures also include the costs of research posts, in calculated value.

\*\* The figure includes ESO's admission and membership fees.

\*\*\* The figure includes the CERN membership fees.

# FUNDING DECISIONS OF THE ACADEMY OF FINLAND IN 2003–2005 BY SITE OF RESEARCH

Site of research	2005	%	2004	%	2003	%
<b>Universities</b>	<b>166,634,384</b>	<b>76.2</b>	<b>173,476,787</b>	<b>83.4</b>	<b>150,526,083</b>	<b>81.6</b>
Helsinki School of Economics and Business Administration	1,118,050	0.5	2,020,890	1.0	911,780	0.5
University of Helsinki	61,102,313	27.9	63,698,407	30.6	51,102,989	27.7
University of Joensuu	5,935,260	2.7	5,097,470	2.5	6,911,030	3.7
University of Jyväskylä	16,620,921	7.6	14,143,830	6.8	13,618,520	7.4
University of Kuopio	8,140,730	3.7	8,070,070	3.9	5,926,040	3.2
University of Lapland	1,221,010	0.6	989,810	0.5	1,692,210	0.9
Lappeenranta University of Technology	919,930	0.4	1,583,210	0.8	1,623,720	0.9
National Defence College	113,380	0.1			750	0.0
University of Oulu	10,498,130	4.8	13,441,280	6.5	9,567,920	5.2
Sibelius Academy	21,000	0.0	719,010	0.3	267,920	0.1
Swedish School of Economics and Business Administration	647,600	0.3	42,400	0.0	1,013,990	0.5
University of Art and Design Helsinki	277,250	0.1	789,990	0.4	1,124,300	0.6
Tampere University of Technology	4,845,440	2.2	6,161,360	3.0	5,914,040	3.2
University of Tampere	9,135,650	4.2	9,531,450	4.6	10,853,924	5.9
Theatre Academy		0.0	150,870	0.1		0.0
Helsinki University of Technology	25,220,330	11.5	20,718,100	10.0	14,645,940	7.9
Turku School of Economics and Business Administration	779,330	0.4	724,280	0.3	832,260	0.5
University of Turku	14,214,730	6.5	17,533,830	8.4	19,133,260	10.4
University of Vaasa	446,460	0.2	278,050	0.1	192,990	0.1
Åbo Akademi University	5,376,870	2.5	7,782,480	3.7	5,192,500	2.8
<b>University hospitals</b>	<b>2,295,740</b>	<b>1.0</b>	<b>1,066,600</b>	<b>0.5</b>	<b>1,088,310</b>	<b>0.6</b>
<b>Research institutes</b>	<b>16,847,596</b>	<b>7.7</b>	<b>11,729,200</b>	<b>5.6</b>	<b>13,910,530</b>	<b>7.5</b>
<b>Foreign organisations*</b>	<b>28,503,920</b>	<b>13.0</b>	<b>16,530,090</b>	<b>7.9</b>	<b>16,068,940</b>	<b>8.7</b>
<b>Scientific societies</b>	<b>1,241,430</b>	<b>0.6</b>	<b>1,371,080</b>	<b>0.7</b>	<b>1,374,970</b>	<b>0.7</b>
<b>Polytechnics</b>	<b>88,220</b>	<b>0.0</b>	<b>77,740</b>	<b>0.0</b>	<b>10,900</b>	<b>0.0</b>
<b>Business companies</b>	<b>248,530</b>	<b>0.1</b>	<b>308,310</b>	<b>0.1</b>	<b>346,730</b>	<b>0.2</b>
<b>Other site of research</b>	<b>2,814,810</b>	<b>1.3</b>	<b>3,363,280</b>	<b>1.6</b>	<b>994,020</b>	<b>0.5</b>
<b>Individual researchers</b>	<b>28,330</b>	<b>0.0</b>	<b>41,360</b>	<b>0.0</b>	<b>116,910</b>	<b>0.1</b>
<b>Total</b>	<b>218,702,960</b>	<b>100.0</b>	<b>207,964,447</b>	<b>100</b>	<b>184,437,393</b>	<b>100</b>

\* The figure includes ESO's admission and membership fees, and the annual contribution to CERN.

## ACADEMY OF FINLAND ADMINISTRATION OFFICE: MANAGEMENT, DIRECTORS AND SECRETARIES OF THE UNITS IN 2005

### Management

Raimo Väyrynen, President  
 Jarmo Laine,  
 Senior Science Counsel  
 (Senior Adviser to President)  
 Irmeli Rautiainen,  
 Assistant to Management

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

Juha Sarkio, Vice President,  
 Administration  
 Päivi Kulo, 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

### Administration Unit

Maarit Saarela,  
 Personnel Manager  
 Inkeri Tyynelä,  
 Department Secretary

### Communications Unit

Maj-Lis Tanner,  
 Communications Director  
 Marjo Aaltomaa,  
 Communications Assistant

### Finance Unit

Pirkko Virtanen, Director  
 Merja Hyttinen, Finance Officer

### Information Management Unit

Seppo Raejärvi, Director  
 Anneli Kauranen, IT Support

### International Relations Unit

Raija Hattula, Director  
 Arja Bqain, Secretary

### Services Unit

Seppo Hongisto,  
 Development Manager  
 Pirjo Moisander,  
 Senior Services Officer

# BOARD AND RESEARCH COUNCIL MEMBERS OF THE ACADEMY OF FINLAND IN 2005

## Board 2004–2006

### Chair

Raimo Väyrynen, President of  
the Academy of Finland

### Vice Chair

Markku Karlsson  
Vice Senior President  
UPM Kymmene 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 Languages 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

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

Leena Vestala, Director  
Gene- and Biotechnology  
Ministry of Agriculture and  
Forestry

Matti Vornanen, Professor  
Animal Physiology  
University of Joensuu

Karl Åkerman, Professor  
Cell Biology  
University of Kuopio

## Research Council for Culture and Society

### Chair

Arto Mustajoki, Professor  
Russian Language and Literature  
University of Helsinki

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

Eila Helander, Professor  
Church and Social Studies  
University of Helsinki

Päivi Hovi-Wasastjerna, 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  
Education  
University of Tampere

Kyösti Pekonen, Professor  
Political Science  
University of Helsinki

Raija-Leena Punamäki, Professor  
Psychology  
University of Tampere

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

Marja Tuominen, Professor  
Cultural History  
University of Lapland

## Research Council for Natural Sciences and Engineering

### Chair

Riitta Keiski, Professor  
Chemical Process Engineering  
University of Oulu

Iiro Hartimo, Professor  
Electronics  
Helsinki University of  
Technology

Hannu Hänninen, Professor  
Mechanical Engineering  
Helsinki University of  
Technology

Timo Jääskeläinen, Professor  
Physics  
University of Joensuu

Mikko Kara, Professor  
Energy Technology  
VTT Technical Research Centre

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  
(Professor as of 1 Jan 2006)  
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  
Nutritional 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 2005

- Lauri Aaltonen  
1 Aug 2002–31 Jul 2007  
Molecular Background of Hereditary Cancer  
University of Helsinki
- Helena Aksela  
1 Aug 2001–31 Jul 2006  
Electron Spectroscopy and Structure of Atoms and Molecules Using Synchrotron  
University of Oulu
- Risto Alapuro  
1 Aug 2005–31 Jul 2009  
Spaces of Democracy, Association and Political Culture in Finland in a Comparative Perspective  
University of Helsinki
- Rauno Alatalo  
1 Aug 2004–31 Jul 2009  
Individual Performance – Inheritance, Maternal Effects and Sexual Selection  
University of Jyväskylä
- Kari Alitalo  
as from 1 Aug 1993 with tenure  
Molecular Biology of Cancer  
University of Helsinki
- Eva-Mari Aro  
1 Aug 1998–31 Jul 2008  
Dynamics and Signaling in Photosystem II  
University of Turku
- Jaakko Astola  
1 Aug 2001–31 Jul 2006  
Signal Processing Algorithm Group  
Tampere University of Technology
- Ralph-Johan Back  
1 Aug 2002–31 Jul 2007  
Formal Methods in Software Construction  
Åbo Akademi University
- Dennis Bamford  
1 Aug 2002–31 Jul 2007  
Structures of Macromolecular Assemblies and Functions of Molecular  
University of Helsinki
- Ilkka Hanski  
1 Aug 1996–31 Jul 2011  
Metapopulation Biology  
University of Helsinki
- 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 2000–31 Jul 2005  
Learning Behaviour and Other Topics in Macroeconomics  
University of Helsinki
- Olli Ikkala  
1 Aug 2005–31 Jul 2010  
Functional Materials Based on Hierarchical Self-Assembly of Synthetic and Biological Polymers  
Helsinki University of Technology
- Sirpa Jalkanen  
1 Aug 1996–31 Jul 2006  
Mechanism Controlling Cell Traffic in Malignancies and Inflammations  
University of Turku
- Kalevi Järvelin  
1 Aug 2004–31 Jul 2009  
Multi-lingual and Task-Based Information Retrieval  
University of Tampere
- Kai Kaila  
1 Aug 1996–31 Jul 2006  
GABA Ergic Transmission: Mechanisms Underlying Neuronal Communication, Development and Pathophysiology  
University of Helsinki
- Olli-Pekka Kallioniemi  
1 Aug 2004–31 Jul 2009  
Functional and Translational Canceromics  
VTT Technical Research Center
- 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
- Martti Koskeniemi  
1 Aug 2005–31 Jul 2010  
The Limits of International Law  
University of Helsinki
- Jussi Kukkonen  
1 Aug 2005–31 Jul 2010  
Ecotoxicology of Natural Organic Material (nom) in Aquatic Systems: Characterization and Effects on Contaminants and Organisms  
University of Joensuu
- Markku Kulmala  
1 Aug 2004–31 Jul 2009  
Formation and Growth of Atmospheric Aerosols  
University of Helsinki
- Antti Kupiainen  
1 Aug 1999–31 Jul 2009  
Mathematical Physics  
University of Helsinki
- Markku Laakso  
1 Aug 2005–31 Jul 2010  
Identification of New Genes for Type 2 Diabetes  
University of Kuopio
- Markku Leskelä  
1 Aug 2004–31 Jul 2009  
Nanomaterials and Nanostructures via Metalorganic Synthesis and Deposition of Thin Films  
University of Helsinki
- Heikki Mannila  
1 Aug 2004–31 Jul 2009  
Algorithmic Pattern Discovery and Theory of Data Mining  
Helsinki University of Technology
- Risto Nieminen  
1 Aug 1997–31 Jul 2002, 1 Aug 2003–31 Jul 2008  
Computational and Theoretical Materials Physics  
Helsinki University of Technology
- Kevät Nousiainen  
1 Aug 2004–31 Jul 2009  
Egalitarian Contentions. Minna Canth Academy Professorship (Women's Studies and Gender Research)  
University of Helsinki
- Hannu Nurmi  
1 Aug 2003–31 Jul 2008  
Studies on Models of Political Institutions  
University of Turku
- Risto Näätänen  
as from 1 Aug 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
- 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 Mechanisms of Multisensory Perception  
Helsinki University of Technology
- Yrjö Sepänmaa  
1 Aug 2000–31 Jul 2005  
The Theory and Practice of Applied Environmental Aesthetics  
University of Joensuu
- Ari Sihvola  
1 Aug 2005–31 Jul 2010  
Electromagnetics of Geophysical, Composite and Metamaterials  
Helsinki University of Technology
- Lea Sistonen  
1 Aug 2004–31 Jul 2009  
Regulation of the Heat Shock Transcription Factors HSF1 and HSF2  
Åbo Akademi University
- Kaarina Sivonen  
1 Aug 2000–31 Jul 2010  
Cyanobacteria and Their Bioactive Compounds  
University of Helsinki
- Jari Turunen  
1 Aug 2005–31 Jul 2010  
Foundations of Wave-Optical Engineering  
University of Joensuu
- 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
- 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
- Seppo Ylä-Herttua  
1 Aug 2005–31 Jul 2010  
Biology and Applications of Therapeutic Vascular Growth  
University of Kuopio

# CENTRES OF EXCELLENCE IN RESEARCH IN 2005

## 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  
Professor Jaakko Frösén

Cell Surface Receptors in Inflammation and Malignancies  
University of Turku  
Academy Professor Sirpa Jalkanen

Center for Activity Theory and Developmental Work Research  
University of Helsinki  
Professor Yrjö Engeström

Centre of Excellence in Disease Genetics  
University of Helsinki, National Public Health Institute and Folkhälsan  
Academy Professor Leena Peltonen-Palotie

Computational Condensed-matter and Complex Materials Research Unit  
Helsinki University of Technology  
Academy Professor Risto Nieminen

Evolutionary Ecology  
University of Jyväskylä  
Academy Professor Rauno Alatalo

Helsinki Bioenergetics Group  
University of Helsinki  
Academy Professor Märten Wikström

Institute of Hydraulics and Automation  
Tampere University of Technology  
Professor Matti Vilenius

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

Molecular Biology and Pathology of Collagens and Enzymes of Collagen Biosynthesis  
University of Oulu  
Professor Taina Pihlajaniemi

New Information Processing Principles  
Helsinki University of Technology  
Professor Erkki Oja

Nuclear and Condensed Matter Physics Programme at JYFL  
University of Jyväskylä  
Professor Juha Äystö

Plant Molecular Biology and Forest Biotechnology Research Unit  
University of Helsinki  
Professor Tapio Palva

Program in Cancer Biology, Growth Control and Angiogenesis  
University of Helsinki  
Academy Professor Kari Alitalo

Programme of Molecular Neurobiology  
University of Helsinki  
Professor Heikki Rauvala

Programme on Structural Virology  
University of Helsinki  
Academy Professor Dennis Bamford

Research Centre for Computational Science and Engineering  
Helsinki University of Technology  
Academy Professor Kimmo Kaski

Research Unit for Forest Ecology and Management  
University of Joensuu  
Academy Professor Seppo Kellomäki

Research Unit for Variation and Change in English  
University of Helsinki  
Professor Terttu Nevalainen

Research Unit on the Formation of Early Jewish and Christian Ideology  
University of Helsinki and Åbo Akademi University  
Academy Professor Heikki Räisänen

Signal Processing Algorithm Group  
Tampere University of Technology  
Academy Professor Jaakko Astola

The Human Development and Its Risk Factors Programme  
University of Jyväskylä  
Professor Lea Pulkkinen

The Metapopulation Research Group  
University of Helsinki  
Academy Professor Ilkka Hanski

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  
Professor Yrjö Kontinen

VTT Industrial Biotechnology Technical Research Centre of Finland  
Research Professor Hans Söderlund

Åbo Akademi University Process Chemistry Group  
Åbo Akademi University  
Professor Mikko Hupa

## Centres of excellence in research nominated by the Academy of Finland for 2002–2007

Applied Microbiology Research Unit  
University of Helsinki  
Academy Professor Kaarina Sivonen

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

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

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

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

Developmental Biology Research Programme  
University of Helsinki  
Professor Irma Thesleff

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

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

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

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

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

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

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

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

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

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

## Nordic Centres of Excellence in Global Change Research 2003–2007

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

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

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

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

## Nordic Centres of Excellence in Molecular Medicine 2004–2009

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

Nordic Centre of Excellence in Neurodegeneration  
Lund University  
Professor Patrik Brundin

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

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

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

Empirical Labor Economics  
Uppsala University  
Coordinator, Professor Per-Anders Edin

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

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

## RESEARCH PROGRAMMES IN 2005

Baltic Sea, BIREME (2003–2005)

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

Environment and Law (2005–2008)

Future Electronics, TULE (2004–2007)

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)

Systems Biology and Bio-informatics, SYSBIO (2004–2007)

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

Wood Material Science (2003–2006)\*

\* The Academy took part in the research programmes through targeted calls.

## HONORARY TITLE OF ACADEMICIAN

### The highest recognition to scientists and scholars

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

### Finnish holders of the honorary title of Academician

Erik Allardt  
Albert de la Chapelle  
Nils Erik Enkvist  
Olavi Granö  
Pekka Jauho  
Eino Jutikkala  
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. Faddejev, Russia  
Hans Fromm, Germany  
Bengt Hultqvist, Sweden  
Leon Lederman, USA

Yuri Ivanovich 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

## ACADEMY OF FINLAND PUBLICATIONS SERIES IN 2005

1/05 Mobile Minds. Survey of Foreign PhD Students and Researchers in Finland. Kaisa Puustinen-Hopper

2/05 Research in Business Disciplines in Finland. Evaluation Report

3/05 Kestävä ja dynaaminen kumppanuus. Yliopistojen,

tutkimuslaitosten ja yritysten välinen tutkimusyhteistyö ja tutkijankoulutus. (available in English, see publication 7/05)

4/05 Development of Research Funding Instruments (in Finnish only)

5/05 Interaction across the Gulf of Bothnia. Evaluation Report

6/05 Research Programme – Sustainable Use of Natural Resources (SUNARE) 2001–2004, Evaluation Report

7/05 Sustainable and Dynamic Partnership. Research Cooperation and Researcher Training between Universities, Research Institutes and Business and Industry

8/05 Promoting Interdisciplinary Research: The Case of the Academy of Finland

9/05 Health Promotion Research Programme 2001–2004. Evaluation report

## ERA-NETs

### Coordination

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

NORFACE, New Opportunities for Research Funding Cooperation in Europe – A Strategy for Social Sciences (2004–2008)

### Partners

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

CO-REACH, Cooperation of Research between Europe and China (2005–2009)

ERA-AGE, European Research Area in Ageing Research (2004–2006)

ERA-Chemistry, Implementation of Joint Bottom-up European Programmes in Chemistry (2004–2006)

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

ERA-Sage, European Research Area on Societal Aspects of Genomics (2005–2010)

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

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

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

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

PathoGenoMics, Trans-European Cooperation and Coordination of Genome Sequencing Functional Genomics of Human-pathogenic Microorganisms (2004–2009)

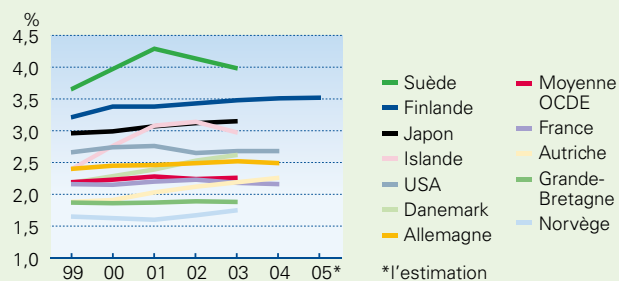
ERASysBio, Towards a European Research Area for Systems Biology (2006–2009)

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

## RÉSUMÉ FRANÇAIS

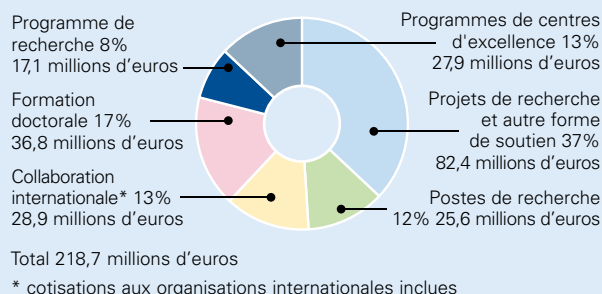
# L'ACADÉMIE DE FINLANDE, FINANCEUR DE LA SCIENCE EN 2005

Contribution à la recherche et au développement dans certains pays de l'OCDE (part des dépenses de R&D par rapport au produit intérieur brut)



Source : OCDE et Institut national finlandais des études statistiques

Décisions de financement par l'Académie de Finlande en 2005, par mode de financement



## Financement de la recherche par l'Académie

En 2005, l'Académie a financé la recherche fondamentale finlandaise à hauteur de 218,7 millions d'euros, les chiffres correspondants pour 2004 étaient d'environ 208 millions d'euros.

Si l'on étudie la répartition du financement, la majeure partie (19 pour cent) a été attribuée au financement de recherche en général, soit 40,8 millions d'euros, puis à la formation doctorale (17 pour cent), à la collaboration internationale (13 pour cent) et aux programmes de recherche (8 pour cent). Les centres d'excellence de la recherche ont reçu 27,9 millions d'euros (13 pour cent).

La recherche finlandaise de haut niveau a également été soutenue par le biais des postes de professeur et de chercheur auprès de l'Académie de Finlande, postes au nombre de 286 au total.

En ce qui concerne le financement, 77 pour cent de l'enveloppe a été dirigé vers les projets et les programmes de recherche universitaires ainsi que vers le financement des centres d'excellence de la recherche. En 2005, l'augmentation de la part des frais d'adhésion et de cotisation aux organisations étrangères provient principalement des frais d'adhésion et de cotisation à l'Observatoire européen austral (European Southern Observatory, ESO).

L'Académie a reçu 5 964 dossiers de demande de financement, équivalent à 1,2 milliard d'euros en tout alors qu'en 2004, la somme correspondante se montait à 930 millions d'euros. La concurrence entre les projets de recherche devient de plus en plus rude. Par exemple, seuls 17 pour cent ont reçu une décision favorable de subventions de recherche. Sur le montant des

financements demandés, seul un dixième a pu être accordé.

Les décisions de financement des projets sont fondées sur une évaluation scientifique établie par des spécialistes nationaux et étrangers. Durant l'année du bilan, l'Académie a fait appel à 1012 spécialistes dont 77 pour cent étaient étrangers.

## La Finlande investit dans la recherche

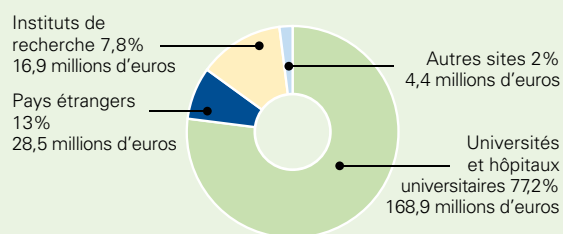
En 2005, l'État a financé les activités de recherche et de développement à hauteur de 1,6 milliard d'euros. Soit une augmentation de 56 millions d'euros par rapport à l'année précédente. Le financement de la recherche a augmenté de 3,6 pour cent en valeur nominale et de 1 pour cent dans les faits. La part de la recherche par rapport aux dépenses de l'État se montait à 4,5 pour cent, soit un chiffre identique à celui de 2004.

La plus importante augmentation du financement de la recherche, à savoir 24 millions d'euros, a été dirigée vers le ministère de l'Éducation, même si les parts de l'Académie de Finlande, de même que celles de Tekes (Agence nationale pour le développement technologique), un autre organisme de financement dépendant du ministère du Commerce et de l'Industrie, sont restées stables en 2005. Ce sont près de 5,3 milliards d'euros qui ont été investis dans la recherche et le développement en Finlande en 2004. Selon les estimations, la croissance des dépenses de R&D en 2005 a été relativement lente et sa proportion par rapport au PIB semble être restée au niveau de l'année précédente, à savoir 3,5 pour cent.

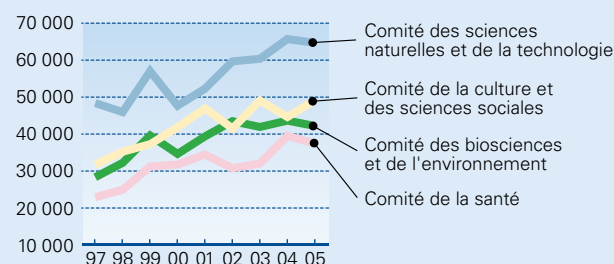
Dans les comparaisons internationales, la proportion des montants investis dans la R&D par



## Décisions de financement par l'Académie de Finlande en 2005, par sites



## Financement de la recherche de l'Académie de Finlande par comité de 1997 à 2005 (1 000 euros)



rapport au PIB est toujours dans les premiers rangs mondiaux. Seuls Israël et la Suède sont classés avant la Finlande.

### Nouvelles ouvertures internationales

En 2005, l'Académie avait des accords avec 42 organisations de coopération de 26 pays. Sur ces accords, quatre ont été signés avec de nouvelles organisations, dont le Department of Science and Technology, DST et le Department of Biotechnology, DBT en Inde, le Fonds humanitaire scientifique russe ainsi que l'Institute of Neuroscience, Mental Health and Addiction, INMHA canadien.

L'Académie a été active tout particulièrement au niveau de la collaboration avec l'Inde, la Chine et la Russie. Des programmes-cadres ont été signés avec l'Inde et le premier séminaire commun a été organisé. Cette coopération continuera en 2006.

L'Académie a signé un programme-cadre avec le Fonds humanitaire scientifique russe, suite à quoi la collaboration a démarré avec trois programmes de recherche. De plus, l'Académie s'est lancée dans une collaboration tripartite avec les Russes dans le programme de recherche Toxicomanie et dépendance. Outre l'Académie, y participent également la Fondation russe pour la recherche fondamentale et le Fonds humanitaire scientifique russe. La collaboration tripartite a également démarré avec le projet de recherche NEURO, projet auquel se sont joints aussi bien la National Natural Science Foundation of China, NSFC, que INMHA. Les accords bilatéraux sont les piliers d'une collaboration internationale en matière de programme de recherche.

L'Académie a renouvelé les accords en vigueur avec cinq organisations : en Iran (Académie des sciences d'Iran IR), au Japon (National Institute of Science and Technology Policy, NISTEP), en Russie (Fondation russe pour la recherche fondamentale, RFFI), en Slovaquie (Académie des sciences de Slovaquie) et en Tchéquie (Académie des sciences de Tchéquie).

La collaboration active entre l'Académie et la Society for the Promotion of Science, JSPS du Japon a continué. En se basant sur l'accord bilatéral renouvelé en 2004, les parties se sont mises d'accord sur les projets du premier programme «core» et ont organisé un séminaire finno-japonais sur les nanosciences au Japon. La délégation finlandaise sur la médecine régénérative a visité des universités et des établissements de recherche japonais de haut niveau dans le domaine.

Dans le programme core réalisé en commun par l'Académie et JSPS, il a été décidé de financer deux programmes communs finno-japonais pour une durée de deux ans. L'objectif du programme core est de promouvoir une collaboration de la recherche finno-japonaise systématique et sur le long terme, de promouvoir la mobilité des chercheurs et d'organiser les congrès scientifiques relatifs aux questions traitées. Le dépôt des dossiers pour le second programme core bilatéral s'est fait en septembre 2005 et les décisions seront prises au printemps 2006.

Lors des préparatifs du programme de nanosciences de l'Académie, la perspective de projets de programmes de recherches financés en commun avec JSPS a été étudiée.

L'Académie a aussi étendu une collaboration toujours plus étroite avec la Chinese Academy of Social Sciences, CASS.

### Les programmes de recherche sont les bases de la coopération

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En 2005, l'Académie avait en cours 14 programmes de recherche dont l'un, réalisé en collaboration avec les Français, Informatique proactive, est arrivé à terme. En 2005, de nouveaux programmes de recherche de quatre ans, LIIKE2 (Compétences dans le monde des affaires) et NEURO (Programme de recherche en neurosciences) ont été élaborés. Le programme de recherche KITARA (Application de l'informatique à la technologie mécanique, de la construction et de l'automatisation) a également démarré.

Le conseil d'administration de l'Académie a décidé de financer cinq programmes de recherche. En 2006, on prendra les décisions en regard de nouveaux programmes de recherche de quatre ans : Production et produits durables, Programme de recherche sur les nanosciences, Toxicomanie et dépendance, Nutrition, aliments et santé ainsi que le Pouvoir en Finlande. Pour le financement de ces programmes il est prévu de collaborer, outre les organismes nationaux, au moins avec des financeurs russes, canadiens et français.

### Les centres d'excellence de la recherche

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Le conseil d'administration de l'Académie a désigné 23 centres d'excellence pour le programme national de centres d'excellence de la recherche pour la période de 2006 à 2011. Sept sont des unités de recherche entièrement nouvelles et seize sont, par rapport au contenu de leur programme et à leur mode de fonctionnement, des unités renouvelées à de nombreux égards, financées durant le premier programme de centres d'excellence de 2000 à 2005.

143 unités en tout avaient déposé un dossier de candidature lors de la première phase du concours organisé en 2004. Sur celles-ci, 53 ont été choisies pour participer au second tour en prenant en considération les rapports d'experts scientifiques internationaux et les grandes lignes de la politique scientifique de l'Académie. Durant la seconde phase, les experts internationaux ont étudié les dossiers de candidature et se sont rendus sur place.

De 2006 à 2008, l'Académie financera un troisième programme national de centres d'excellence

de la recherche (de 2006 à 2011) à hauteur de 28,6 millions d'euros, Tekes y participera à hauteur de 2 millions et Nokia Oyj à hauteur de 300 000 euros.

Les 16 unités financées dans le cadre du second programme national de centres d'excellence (de 2002 à 2007) ont continué leur travail. Le premier programme de centres d'excellence, avec 26 unités et leurs organisations de soutien, s'est achevé à la fin de l'année du bilan. L'évaluation finale internationale du premier programme est à l'étude et le programme sera évalué en même temps que le programme de centres d'excellence 2002–2007, en 2008.

En 2005 a démarré le troisième programme de centres d'excellence nordique. Quatre réseaux de recherche, comportant des groupes de recherche et des chercheurs de trois pays nordiques, ont été choisis pour le programme de centres d'excellence commun aux pays nordiques dans le domaine de la recherche sur la culture et la société. Ce programme s'étend sur la période 2005 à 2010. Des chercheurs finlandais sont impliqués dans tous les centres d'excellence. Le programme est financé par les comités nordiques sur la culture et la société, (NOS-HS) et par NordForsk.

L'évaluation intermédiaire du programme de centres d'excellence nordique concernant la recherche sur les changements globaux a été finalisée en 2005. Ce programme a été financé par les comités des sciences naturelles, des sciences de l'environnement et de la technologie dans les pays nordiques (NOS-N) et par NordForsk. Les quatre centres d'excellence financés dans le programme et le concept général des programmes de centres d'excellence nordique ont reçu un accueil extrêmement positif de la part du groupe de soutien scientifique international. Sur la base du rapport intermédiaire, il a été décidé de financer les deux dernières années des centres d'excellence. L'un des centres d'excellence du programme est coordonné par un Finlandais et des groupes de recherche finlandais participent à deux autres centres.

Les unités de recherche participant au programme de centres d'excellence sur les sciences moléculaires médicales (de 2004 à 2009) financés par les comités nordiques de recherche sur la santé (NOS-M) et NordForsk ont continué activement et mis en route leur programmes de formation doctorale. Ce sont trois centres en tout qui sont financés, l'un est coordonné par un Finlandais et des groupes de chercheurs finlandais participent à deux autres.

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