

ProAcademia

NEWS FROM THE ACADEMY OF FINLAND
2/2006



**ACADEMY RESEARCH
FUNDING HAS
TANGIBLE IMPACT**

**NEUROSCIENCE
COOPERATION
ACROSS THREE
CONTINENTS**

Editorial

Professor Raimo Väyrynen, President of the Academy of Finland

As a concept, innovation has old roots, but in recent years it has gained new urgency. It has come to signify a new dynamic approach to reform the stagnant economic structures in Europe. Scientific research and even technology are often considered inadequate responses to the slow growth of productivity and of the economy as a whole. Instead, innovation produces not only new products and processes, but also novel ideas and industrial breakthroughs that open up a new trajectory of development.

Innovations are a central part in the story of economic transformations, especially if they have long-term impact as the steam machine, electricity and computer have had. Their initial effects on productivity may have been limited but, over time, the impact has gathered strength. Yet, the belief in the transforming power of innovations can be naïve and even deceptive. Innovations do not stand alone, but they have to be placed in a context.

It would be equally naïve to argue that basic research and, subsequently, applied research is always needed to produce innovations (that can be both of a technological, social and cultural kind). They can also be generated by fertile minds and practical experiences without painstaking work in laboratories and library booths. On the other hand, not all basic research needs to aim at practical innovations. Thus, science and innovation should not be equated with each other even though they interact in multiple ways. Innovations are often produced by everyday demand rather than the supply of knowledge. Therefore, one should encourage also demand-driven innovations.

Science is expected to establish new invariances and break old ones. As science can change even the premises of our Weltanschauung, it can have deeper consequences than any innovations. Not all research needs to be utilitarian, but it can be pursued also for the sake of the transforming power of its ideas. The social and economic effects of these ideas are often complicated, indirect and delayed, but they can potentially be revolutionary in nature.

Without science, innovation can deteriorate into tinkering that lacks the transforming power of new fundamental ideas. Science is able to contribute to the long-term well-being of society, what applied research alone cannot produce. Scientific research is not a panacea, and it is often an inadequate tool, but it is the salt of the earth in the quest of the humankind to improve its condition (provided, of course, that the demons of technology, engendered by science, do not destroy it!).

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Finnish Theologian Juha Pakkala receives EURYI Award

Docent Juha Pakkala from the Faculty of Theology of the University of Helsinki receives the European Young Investigator Award in 2006. The award is worth 1.1 million euros. Besides Pakkala, the prize is awarded to 24 young researchers working in Europe.

Pakkala is a merited researcher of the Old Testament, first of all of the Books of Ezra and Nehemiah and the origin of monotheism. Pakkala defended his doctoral dissertation on the theme in 2000. He has also led archaeological excavations at Kinneret in Northern Israel.

Pakkala will use the prize money to study how the Old Testament texts and the tradition have changed. One of the key questions is if any old texts have been removed over the course of generations. The reasons for this may have been for example theological; i.e. something has been removed for doctrinal reasons. The subject is approached by, for example, comparing different translations and parallel Old Testament texts. The research team involves seven scholars.

Pakkala has been an Academy Research Fellow (2005–2006) and Academy Postdoctoral Researcher (2002–2004). He has also been a university lecturer in Old Testament Exegetics and lecturer in Exegetics. Pakkala has also worked as a researcher in the Research Unit on the Formation of Early Jewish and Christian Ideology, led by Professor **Heikki Räisänen**, which has been one of the Centres of Excellence of the Academy of Finland.

The European Young Investigator Awards (EURYI), created by the European Heads of Research Councils (EUROHORCs) in collaboration with the European Science Foundation (ESF), are awarded now for the third time. The EURYI Awards scheme aims to provide resources for young talented researchers to pursue an independent research career and enhance internationally high-level research in Europe. National research funding organisations from 16 European countries participate in the funding of the EURYI Awards. Finland is represented by the Academy of Finland.

Researchers receiving EURYI Awards have been



Photo Johnny Korkman

selected in an open competition. The assessment of applications submitted for Awards was carried out in a two-stage process at the national and European level. A total of 457 applications were submitted, of which 116 were shortlisted, among them five Finnish researchers, to be reviewed by an international panel. Altogether 57 of the most merited researchers were invited for interviews. The EURYI Award ceremony was held in Prague in October. ■

Shuji Nakamura wins the 2006 Millennium Technology Prize

The 2006 Millennium Technology Prize has been awarded to Shuji Nakamura. Professor Nakamura has developed a new, revolutionary source of light – bright-blue, green and white LEDs and a blue laser. The technology is used in several applications which improve the quality of human life. The world's largest technology prize, now awarded by Finland's Millennium Prize Foundation for the second time, has a value of one million euros.

Professor Shuji Nakamura's innovation has launched a totally new sector in light-producing semiconductor research and development. His development also made possible the widescale industrial production of efficient, energy-saving LED lights and created the conditions for applications that improve the quality of human life.

LED lights have extremely long lives and consume far less energy than normal incandescent lamps. In industrialised countries, the opportunities for energy-saving LED lights are significant – it has been calculated that in the USA alone, replacing current lighting systems with systems based on LED lights could achieve very significant reductions in energy consumption in future decades. The new light sources are also well suited to operation with solar power systems and are therefore ideal for use in remote areas of developing countries.

One of the most significant future applications for Shuji Nakamura's invention is the sterilisation of drinking water, since the use of ultraviolet LEDs makes the water purification process both cheaper and more efficient. Systems based on this technology are expected to improve the lives and health of tens of millions of people.

Data storage and transfer using light generated by blue lasers brings significant benefits: for example, the amount of data stored on CDs or DVDs can be increased by some five times compared to current techniques.

“Shuji Nakamura is a splendid example of perseverance and dedicated research work, and of making a major breakthrough. He has worked with great determination for decades, and even severe setbacks haven't prevented him from achieving something that



other workers in the field regarded as almost impossible: using a reactor system of his own design to develop a solid material, in this case gallium nitride, into a powerful light source producing blue, green and white light, and also creating a blue laser. In the course of time, energy-efficient light sources based on Shuji Nakamura's innovation will undoubtedly become predominant,” says **Pekka Tarjanne**, Chairman of the International Selection Committee.

Professor Shuji Nakamura was born in Japan in 1954. He has worked in the USA at the University of California, Santa Barbara since 2000, and his research work into new sources of light continues.

In accordance with the rules of the Millennium Prize Foundation, a proposal concerning the winner of the Millennium Technology Prize is made to the Board of the foundation by the eight-member International Selection Committee, and the final decision on the prize winner is made by the Board.

The prize is awarded every second year for an innovation that improves the quality of human life and well-being. ■

Top researcher recruitment from abroad brings 24 professors to Finland

The Academy of Finland and Tekes have decided to fund 24 research projects with 17.5 million euros within the funding programme for visiting top researchers in science and technology. The funding will be available to recruit 24 visiting top researchers to twelve Finnish universities and research institutes for 2–5 years. The first top researchers will begin work at the beginning of 2007.

The Academy of Finland will fund 16 projects with 10.6 million euros and Tekes eight projects with 6.9 million euros.

The goal of the Finland Distinguished Professor Programme (FiDiPro) is to raise the level of scientific and technological knowledge and know-how in Finland and add a more international element to the Finnish research system. It is also geared towards supporting research-driven profiling of universities and research institutes and creating new kind of international cooperation between university-based research and business companies.

In the call for letters of intent that expired at the end of January 2006 Finnish universities and research institutes defined their competence areas and named the foreign or expatriate Finnish researchers who could further reinforce the research environments in these areas. Universities and research institutes named close to a hundred researchers to be funded within the programme. The Academy and Tekes selected 35 of these candidates for the second phase.

“The FiDiPro call generated exceptionally strong interest among universities, and the professors selected through international reviews proved to be top-rate researchers. It’s also interesting to note that some top researchers, who’ve long worked abroad, are disposed to return home,” President **Raimo Väyrynen** of the Academy of Finland says.

Tekes Director General **Veli-Pekka Saarnivaara** sees

a visible demand for the funding programme in Finnish business and industry: “Being the success it is, this first call reflects the need for the FiDiPro Programme. What’s particularly positive from Tekes’ viewpoint is that the programme was able to attract good candidates for areas relevant in terms of industry.”

Plans are on for a second FiDiPro round of applications to be opened in 2007.

“This is, however, only the beginning,” Saarnivaara points out. “The set goal of adding a genuine international element to our research system and increasing its appeal still requires much work. The FiDiPro Programme is one form of cooperation we can make good use of in this work.”

The next challenge, says Väyrynen, is to see to that the professors coming to Finland find Finnish research environments match their expectations, that they give their full input to Finnish science, and that they enjoy their time in Finland. As the FiDiPro Programme continues the application process must be developed to make it as efficient and flexible as possible. ■

www.fidipro.fi

Academy allocates 7.5 million euros to research on sustainable production

Over the next four years, the Academy of Finland Research Programme on Sustainable Production and Products (KETJU) will produce new research knowledge in the fields of green chemistry and industrial ecology and eco-efficiency. Total funding for the programme will amount to 7.5 million euros.

The main aim of the KETJU programme is to strengthen basic research in process engineering and chemistry with a view to supporting future industrial research and development. Important advances and breakthroughs are expected among other fields in the recycling of

raw materials, waste reduction and new product and production innovations.

One of the projects funded under the programme's umbrella is a joint research venture between the University of Oulu and Lappeenranta University of Technology, aimed at facilitating the use of biomass from agriculture in the production of paper, green chemicals and bioenergy. Ultimately, the goal is to create a model of an eco-efficient biorefinery, which would comprise the self-sufficient production of energy and process chemicals, the integrated production of paper and paper chemicals from lignocellulose and the re-use of biomass in high value added products. Furthermore, the project is aimed at minimising the biorefinery's freshwater use. In charge of this project is Professor **Juha Tanskanen** from the University of Oulu.

Another joint venture is a project in which scientists from the University of Oulu and Helsinki University of Technology will be working to develop new kinds of eco-efficiency indicators for industrial ecology. The aim here is to gain a better understanding of the variation resulting from the time and scale limitations of the indicators. The research project will offer a comprehensive, comparative and systems-level analysis of the eco-efficiency of the case industrial eco-systems. The project is conducted under the direction of Professor **Kari Heiskanen** from Helsinki University of Technology. ■
www.aka.fi/ketju

Research to pin down health effects of nanotechnology

At present, not enough is known of the health effects of nanotechnology. The Academy of Finland has, therefore, selected the consortium Nanohealth to spearhead the Research Programme on Nanoscience (FinNano). The objective of the project is to produce nanoparticles, define particles that affect working environments and

assess exposure to them and their health effects. The project is headed by Professor **Kai Savolainen** of the Finnish Institute of Occupational Health.

Nanotechnology is a rapidly growing focus area of competence that produces innovative solutions to be put to good use in several branches of industry. "Successful nanotechnology- and nanoparticle-based innovations and productivity requires that the safety of the nanoparticles used is ensured through high-quality toxicology and safety research," consortium leader Savolainen says.

Apart from health promotion, FinNano also provides funding for molecular electronics research and research into mechanical characteristics of nanostructures as well as for basic research in the field. In addition to the scientific goals, the programme aims to advance responsible development of nanotechnology by taking into account ethical challenges, i.e. matters related to safety, health and the environment.

The Academy of Finland will provide nine million euros in funding for the programme. So far, the Academy has made funding decisions worth more than seven million euros. The remaining 1.3 million euros will be granted in December. The programme will run from 2006 through to 2010.

The Academy's FinNano programme will be carried out in close cooperation with the Tekes technology programme FinNano, and the two programmes will have joint planning and other activities, such as seminars and communications. In addition, the Academy is participating in the ERA-NET project NanoSci-ERA funded through the EU Sixth Framework Programme. NanoSci-ERA is making preparations to carry out a multinational research programme on nanoscience during 2007–2009. ■
www.aka.fi/finnano

Commissioner welcomes the new 'Champions League' of research to enhance basic research

"The European Research Council means new opportunities for prominent individual research teams. It brings a good feeling. However, the responsibility to apply is theirs," says Janez Potočnik, European Commissioner for Science and Research.

Text: Jatta Väisänen
Photo: European Commission

The long preparation of the Seventh Framework Programme (FP7) is approaching its end, with a new seven-year period for European research starting in January 2007. A new approach to basic research is launched within FP7. The European Research Council (ERC), the core of the Ideas Programme, is one of the new breakthrough ideas aiming to foster creativity and excellence at the frontier of knowledge.

"The ERC brings a good feeling," says Potočnik proudly. "We're introducing a kind of 'Champions League' of research that's open to individual teams," explains the Commissioner. According to Potočnik, crucial to the ERC is that it will have total autonomy and the main criterion for the evaluation is excellence.

Young and promising researchers in Europe will have the honour to apply in the first round of funding from the ERC, but later on

the calls are open to researchers at all stages of their careers. Even though the idea for this came from the Scientific Council of the ERC and not from the Commission, the Commissioner is delighted to see that the ERC will finance directly the research activities of young researchers who would not otherwise have this kind of possibility to establish their careers. "Apply, apply, and apply. If you don't get the funding the first time, try again," the Commissioner encourages prominent young researchers.

Thanks to years' experience as a researcher he understands the disappointments: "After not being selected it's perfectly human to feel that the challenge wasn't the greatest in the world, but you have another opportunity. And the ERC is the opportunity you never had before, so use it, if you think you have unique and outstanding ideas that would meet the criteria."

BASIC RESEARCH AND INNOVATION POLICIES CANNOT BE SEPARATED

Commissioner Potočnik does not make a strong distinction between basic research and applied research. In his view, they both play a very relevant role for Europe's competitiveness. "If we wish to have results in the future, we have to plant a tree. The growing tree is an investment for the future. You have to take care of the whole tree, even though among the good fruits there may be some rotten ones. This is how the relationship between basic research and innovation policies should be viewed."

Commissioner Potočnik claims that development has to be taken step by step. He adds that basic research and innovation policies are excellent companions to each other for another important reason as well: basic research brings new ideas and breaks frontiers but without innovation the results, or even



Commissioner Janez Potočnik does not make a strong distinction between basic research and applied research. In his view, they both play a relevant role for Europe's competitiveness.

accidental discoveries, made during the research could not be translated into success.

EUROPE NEEDS ACTIVE INDIVIDUALS AND COMMITTED MEMBER STATES

It is not only excellence that will guarantee the competitiveness of European research, but active individuals and commitment from the Member States. According to the Commissioner, individuals have to take the initiative to get their voice heard.

However, he acknowledges that there exists a significant gender gap in science, but points out that the answer to this problem does not lie only in R&D policies. "If we want

to have the best research potential we have to cooperate and work on these challenges," says Potočnik.

EXCELLENCE AS THE MAIN CRITERIA FOR RESEARCH EVALUATION

Excellence plays a major role in the evaluation of research. However, the evaluation is not done by the Commission; it is conducted by independent experts. Naturally, these experts have to follow certain principles set out by the Commission.

Thus, excellence is a top priority in a broad sense. "I understand that not everybody has equal starting points, but this shouldn't prevent us from working. This has to be a top

priority also in the Member States. They have to put in the resources to develop their R&D potential," Potočnik claims. The Commissioner says that there are a number of institutions in Europe that could be turned into networks of excellence.

"We're seeking the best of the best. However, one of the criteria is that during this process also those who're close to meeting the criteria can be shifted into the level of excellence." Europe needs cooperation and development to activate research potential in order to generate results and excellence in the long run. Then the overall result is that we are moving ahead. ■

Panel of experts concludes:

ACADEMY RESEARCH FUNDING HAS TANGIBLE IMPACT

Text: Riitta Tirronen
Photo: Mauri Ratilainen

Research funding from the Academy of Finland has been instrumental in developing and supporting high-level basic research and in promoting dynamic change in the university and research institute system, says a panel of experts commissioned to assess the impacts of Academy funding.

“According to this assessment the Academy has been highly successful in its core mission,” says chair of the panel Professor **Jussi Huttunen**, Director-General Emeritus of the National Public Health Institute.

It shows that Academy research funding has had a key role in facilitating independent research and in promoting its quality throughout the country, Professor Huttunen continues.

“The allocation of basic research funding through open competition helps to raise the standards of research both at universities and research institutes. The quality systems developed by the Academy, particularly its procedures for reviewing applications for research grants, raise the level of research and strengthen its impact.”

Published at the end of August, the impact assessment is part of a larger Academy project in 2005–2006 to explore the impacts of research and research funding, the standards and structure of science

and research and the future challenges facing the research system. As part of the project, assessments were published in the spring of the impacts of research funded by the Academy’s four Research Councils.

“One of the major difficulties in assessing the impacts of Academy funding is that it represents only one part of the innovation system. Much depends on the role and contribution of other parts of the system, such as universities. The problem is how to distinguish the Academy’s role from that of other players,” Professor Huttunen explains.

A further complicating factor, Huttunen continues, is that the Academy does not itself produce the end product, but its job is to help and support research organisations in achieving that end product, i.e. research knowledge.

The assessment was conducted by consulting science policy and R&D experts. In addition, each panel member interviewed 3–4

experts using the same interview structure. The panel also reviewed the literature on impact assessment methods.

MORE FORESIGHTING FOR THE FUTURE

In the panel’s judgement the Academy has in place a range of effective funding mechanisms, and its decision procedures are just and fair. The panel believes the most important type of funding with the greatest long-term impacts is general project funding.

“The Academy’s funding instruments work very well indeed: the procedures that are in place allow the Academy to identify the most innovative projects.”

However, the panel recommends that the level of Academy research funding be increased with a view to strengthening basic research in Finland. The extra funds should be allocated to general project funding, and part of these monies should go to promising new research areas and high-risk ventures. Additional



"Products, innovations and welfare are all grounded in basic research", says Professor Jussi Huttunen.

funding should also be made available for the postdoc programme, Academy Research Fellow posts, infrastructure support and overheads grants.

"The Academy should target its funding more selectively to a fewer number of research groups and

programmes and at the same time increase the overall volume and duration of funding for those groups and programmes. Funding for Centres of Excellence should also be increased, because international comparisons suggest the current level of funding per unit is low,"

Professor Huttunen says.

Apart from general project funding, other funding instruments that the panel rated as having a particularly strong impact were Academy Research Fellow posts, postdoc funding and funding for centres of excellence.

**BASIC RESEARCH:
THE KEY TO EVERYTHING**

One of the panel's recommendations for increasing the impacts of funding for basic research is to develop and improve the negotiation mechanisms between the Academy and universities. As they stand today, university and Academy funding mechanisms are inadequately synchronised, the panel concludes. The panel report identifies problems both with cost allocation, infrastructure funding, researcher training and the planning of research careers.

"The main criteria in the allocation of funding are obviously the quality and innovativeness of research, but in some types of funding it might be useful to take account of strategic objectives related to the research environment and structures – as is the case with the Finland Distinguished Professor Programme, which is designed to promote the development of innovative research environments."

The impact assessment drew attention to the scarcity of funding for basic research in Finland, which is a source of grave concern for Professor Huttunen. Overall, Finland has a very strong R&D budget, but the bulk of it is corporate R&D funding. Finnish R&D funding appears much less impressive when the focus is shifted to government funding for basic research.

"In an international comparison we only just rank in the middle group. Yet, as far as our innovation system is concerned the key to everything is maintaining a high level of basic research", Huttunen points out. "Products, innovations and welfare are all grounded in basic research. Culture and the social sciences also have key significance to social development as a whole. Without the contribution of these areas, other impacts won't filter through to society." ■





Impact report useful for development

“The panel makes a number of interesting observations and proposals that expand on the Academy’s current policy for development,” says Academy of Finland President **Raimo Väyrynen**, commenting on the expert panel report on the impact of Academy research funding.

“It’s clear that many of these proposals will be put to good use in development work and strategic planning at the Academy.”

Väyrynen is nevertheless of the opinion that, for the most part, the panel’s recommendations pertain more to the Academy as an organisation, its working methods and funding instruments than directly to the impact of Academy-funded research.

“The panel justly finds that it’s very difficult to assess the impact of basic research. Impact is multi-dimensional, multi-period and primarily indirect. Often researchers themselves don’t get to see the impacts of their work; their successors perhaps do. The foreseeable benefit of research can, therefore, not be considered a clear-cut criterion when making decisions on research funding. Even so, investigating the impact and significance of research is a key issue of research policy.”

In line with the panel’s recommendations the Academy aims to further promote its cooperation with universities. Cooperation is already carried out, for instance, in the review of applications and negotiations for funding for Centre of Excellence programmes as well as in the Finland Distinguished Professor Programme. The universities and the Academy have a common interest: the scientific quality in funding decisions.

“The panel seems to infer that universities should have more say in the allocation of funding. However, as things stand universities and their scholars compete with each other for research funding, and there are no other coordinating bodies in this competition besides the Academy,” Väyrynen points out.

“As the panel says, the inadequate research funding made available to universities also very much undermines the impact of Academy funding. Universities should have more resources available for jointly funded projects, for instance. It’s in our common interest to effectively harness the existing, high-level intellectual and material capacity in Finnish science.”

“In this respect Academy funding acts as a resource, and does also, if implemented correctly, generate new multiplier effects.” ■

Research Programme on
Neuroscience 2005–2009

COOPERATION ACROSS THREE CONTINENTS

Text: Petra Houghton

Photo: Mauri Ratilainen and Vesa Ranta

In the past twenty years, neuroscience has been developed from a collection of approaches to an independent discipline. Now, at the forefront of science, it is faced with a number of challenges. Those challenges can only be answered by investing in high-quality, international research in the field. The Research Programme on Neuroscience, NEURO, coordinated by the Academy of Finland, brings together top neuroscientists on three continents.

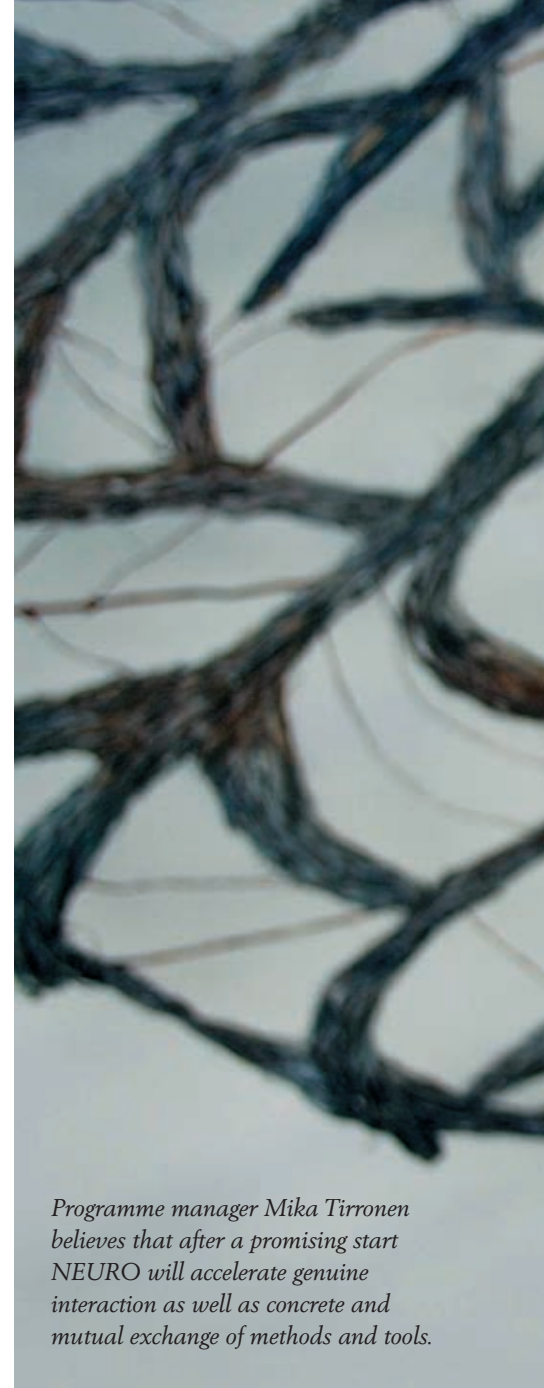
Millions of people in the world suffer from neural disorders. Neuroscience, breaking conventional boundaries of science and drawing from a number of disciplines, such as biomedical sciences, information sciences, philosophy and psychology, plays a crucial role in the study of various neurological and psychiatric disorders as well as in the development of treatment for those disorders. Furthermore, neuroscience has an increasing influence

on the development of new intelligent technologies.

A joint effort of research institutions in Finland, Canada and China, NEURO is an international, jointly funded research programme of three parties: the Academy of Finland, the Institute of Neuroscience, Mental Health and Addiction (INMHA) of the Canadian Institutes of Health Research, and the National Natural Science Foundation of China (NSFC).

Why, of all countries, were China and Canada selected as partners?

“Both countries are known for their high level of research in the field of neuroscience. It’s always nice to work together with Canadians, because their open way of operating suits us well. China, in turn, together with Japan, is a rising power in the field of neuroscience in the east. Many Chinese top neuroscientists have returned to their home country in recent years,” says Programme Manager **Mika Tirronen**



Programme manager Mika Tirronen believes that after a promising start NEURO will accelerate genuine interaction as well as concrete and mutual exchange of methods and tools.

from the Academy of Finland.

ONE PLUS TWO EQUALS MORE THAN THREE

After a promising start, Tirronen believes, the projects within NEURO will accelerate genuine interaction as well as concrete and mutual exchange of methods and tools.

“My visit to China a while back to meet up with our Chinese partners was a success. We got on very well and I sensed that they were truly interested in establishing con-



crete ways of collaboration,” says Tirronen.

The coordinators in Canada and China, too, believe that at the end of the day the cooperation will result in more than what each party could accomplish alone.

Assistant Director **Astrid Eberhart** of the INMHA, says:

“There’s significant strength in the neurosciences in these three countries and the programme structure facilitates networking and encourages researcher mobility. The

collaborative approach maximizes existing expertise and available funding and will provide unique opportunities for researcher training.”

Lu Rongkai from the NSFC of China states:

“The programme has provided a totally new mechanism for the NSFC to cooperate with partner organisations from other countries. Based on our previous successful experiences as well as on the strict international review, I’m confident

that the Chinese-Finnish collaboration within the neuroscience programme will be another success.”

The Academy of Finland funds 23 research projects with a total of just over 7.1 million euros within NEURO. Seven of the projects are joint ventures between Finland and Canada or Finland and China. The Chinese and the Canadian research teams get their funding from the funding body in their own country. ■



Tools for early detection of neurodegenerative and psychiatric diseases

One of the Finnish-Chinese projects in the Research Programme on Neuroscience (NEURO) studies spontaneous brain activity and its changes. The primary goal of the consortium is to develop tools for the clinical detection of those changes.

Vesa Kiviniemi, one of the principal investigators of the research team from Oulu University Hospital, Department of Diagnostic Radiology, believes that their research findings could have a clear impact on the diagnoses and treatment of disorders, such as schizophrenia and Alzheimer's disease, which affect public health extensively.

Stimulus-evoked brain activity has been an object of study for a long time. Spontaneous activity of the neural network, on the other hand, has not been receiving serious attention for very long as the entire phenomenon had remained undiscovered until a few years ago.

What Vesa Kiviniemi hopes most, is that faster and more practical tools could be developed to help medical staff in their daily work.

The more is known about spontaneous brain activity, the more possibilities will be opened up to the research and early detection of neurodegenerative and psychiatric diseases.

"Take Alzheimer's disease, for instance. Before, it wasn't possible to ascertain the diagnosis until the disease had resulted in anatomical changes of the brain. What we know now, is that changes in the neural network precede the anatomical changes," explains Kiviniemi.

TOOLS FOR THE FAST-PACED CLINICAL ENVIRONMENT

What Kiviniemi hopes most, is that faster and more practical tools could be developed in the course of NEURO to help medical staff in their daily work.

"The imaging of neural networks with the existing tools takes a lot of time. That's time you don't have during your average day," says Kiviniemi.

Even though the work of the consortium may still be at its early stages, Kiviniemi feels positive about the forthcoming cooperation with the Chinese research team.

"When we met for the first time, we started to analyse data straight away. They gave me a programme

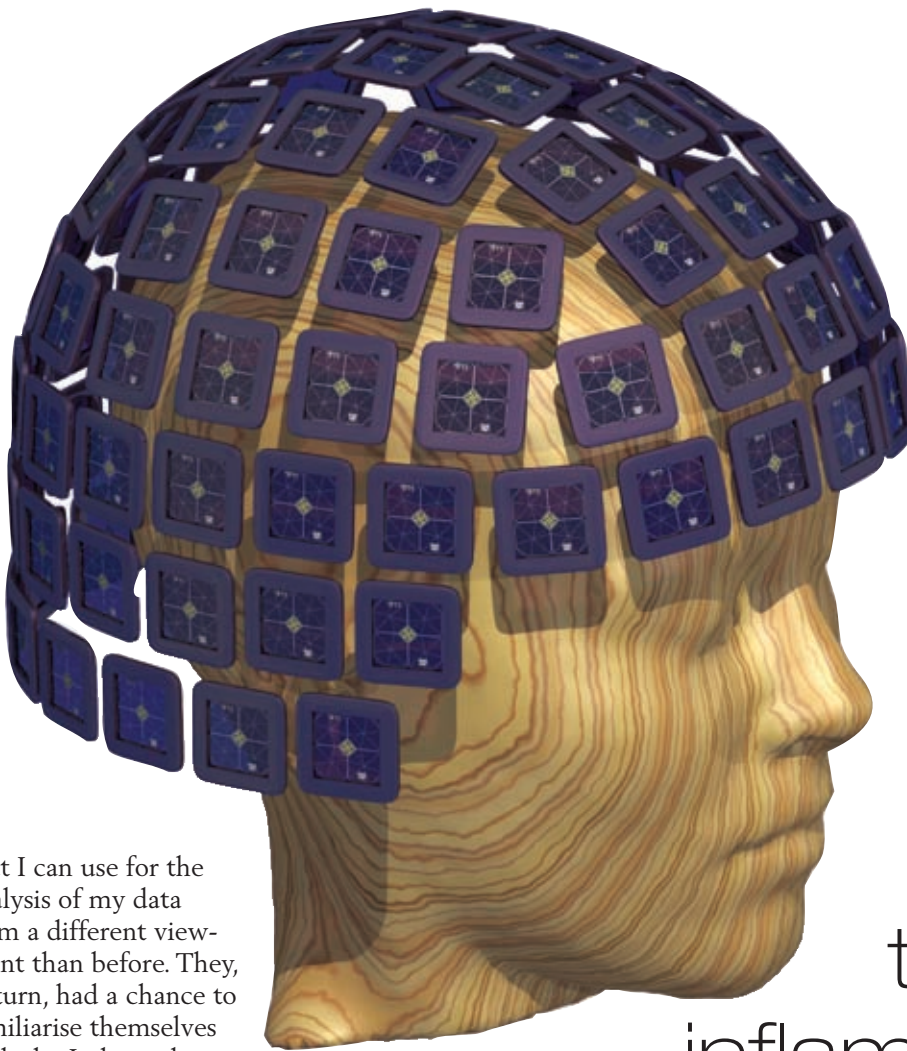


Image by (courtesy of) Mika Seppä,
Brain Research Unit,
Low Temperature Laboratory,
Helsinki University of Technology

that I can use for the analysis of my data from a different viewpoint than before. They, in turn, had a chance to familiarise themselves with the Independent Component Analysis (ICA) for the decomposition of data into statistically independent sources,” explains Kiviniemi.

SUCCESSFUL COOPERATION DEPENDS ON THE RIGHT ATTITUDE

Kiviniemi points out that concrete benefits of the cooperation between the research teams depend largely on the attitude of the parties involved.

“If everyone just insists on being over-protective about their own data and findings, it’s obvious that at the end of the day no one will win.”

The cooperative organisations of the consortium are the Department of Diagnostic Radiology at Oulu University Hospital in Finland and the State Key Laboratory of Cognitive Neuroscience and Learning at Beijing Normal University in China. The principal investigator in China is Professor **Yu-Feng Zang**. ■

What is the role of inflammation in nervous system diseases?

The aim of the Finnish-Canadian research team is to investigate the role of inflammation mechanisms in the onset of neuronal injury.

It is well known that a number of common nervous system diseases, for instance multiple sclerosis, are inflammation diseases. In addition, inflammation mechanisms play a key role in the pathogenetic mechanisms of Alzheimer’s disease and Parkinson’s disease.

The blood-brain barrier controls the entry of substances from the blood into the brain, thus protecting the central nervous system from the effects of harmful substances as well as inflammations. However, in

multiple sclerosis, for instance, leucocytes penetrate the blood-brain barrier and cause the symptoms of the disease. In Alzheimer’s disease and Parkinson’s disease, in turn, certain resident cells of the brain are activated, thus causing neuroinflammation and, if unresolved, neuronal injury.

“Our aim in this project is to investigate the molecular mechanisms essential for leukocyte migration through the blood-brain barrier. When we get to know these mechanisms better, the next relevant question is how the migration of these cells could be prevented,” explains Professor **Heikki Rauvala**



“Our aim in this project is to investigate the molecular mechanisms essential for leukocyte migration through the blood-brain barrier”, explains Professor Heikki Rauvala.

from the University of Helsinki, one of the principal investigators of the project.

EXCHANGE OF KNOWLEDGE, SKILLS AND METHODS

Even though cooperation with the Canadian colleagues has not started at full speed yet, Rauvala believes that the researchers will have a lot to learn from each other.

“Paul Kubes and his team have developed great systems used for the imaging of migration of leukocytes in brain capillaries through the blood-brain barrier. I hope that we’ll be given an opportunity to use the imaging systems in our research,” says Rauvala.

He is confident that the knowledge and the expertise of the Finnish scientists will benefit the Canadians, too.

“The other main investigators of this project in Finland, **Sirpa Jalkanen** and **Marko Salmi**, are internationally acknowledged researchers in the field of leukocyte migration. I’m sure that their studies and expertise will interest our project partners in Canada.”

Visits from Finland to Canada and vice versa are in Rauvala’s opinion a prerequisite for successful cooperation.

“We haven’t been able to organise any trips yet, but I hope these plans will materialise in the near future.”

Even though Rauvala emphasises that the focus of their investigation is clearly on basic research, he believes that the work of the team will eventually lead to the discovery of new inflammation mechanisms and previously unknown target molecules for future drug development.

In addition to the University of Helsinki, the scientists of the project come from the University of Turku and the National Public Health Institute in Finland, and from the University of Calgary in Canada. ■

NEW TECHNOLOGIES SOLVE SHORTAGE PROBLEMS

Text: Marja Keränen

Global business based on local health care solutions, the application of ICTs, environments conducive to learning, adapting to climate change and new energy technologies are all examples of future possibilities for Finnish research and development.

Countless more examples were found when some 120 experts from various fields examined the driving forces affecting business and society in the six-month foresight project FinnSight 2015. The results of the project, jointly led by the Academy of Finland and Tekes, the Finnish Funding Agency for Technology and Innovation, were published in June.

A common denominator of the reports submitted by panels from different fields is the desire to find solutions using new technologies, as well as the need to adapt practices to shrinking resources and realities of the municipal economy. Internationalisation and the charting of export opportunities were also prevalent throughout the project.

FinnSight 2015 is the most extensive science and technology foresight project ever conducted in Finland. Similar surveys have been conducted elsewhere in the world, for example in Germany, the UK,

France and Japan. The project examined changes in the global operating environment, rising needs in business and society, and developmental prospects for science and technology.

“The future isn’t created by foresighting, but through concrete action. Foresighting helps define the organisation’s goals by indicating both emerging opportunities and by warning of undesirable trends,” explains one of the project heads, **Raimo Väyrynen**, President of the Academy of Finland.

“Coupled with the impact assessments of scientific committees, foresighting makes it possible to clearly define the science policy strategies and provide ideas for the development of venture capital financing.”

Experts sought to identify future challenges and to analyse the focus areas of competence whose strengthening would promote social

welfare and a competitive business sector through scientific research and innovation.

The project was divided among ten panels of experts, whose task was to identify common focus areas of competence crucial to technology, business and the functioning of society in the future. In addition to two chairs, each panel comprised ten expert members. ■

The expert panels for the FinnSight 2015 project were:

- Learning and Learning Society
- Services and Service Innovations
- Well-being and Health
- Environment and Energy
- Infrastructure and Security
- Bio-expertise and Bio-society
- Information and Communications
- Understanding and Human Interaction
- Materials
- Global Economy

More information www.finnSight2015.fi

New energy technologies an opportunity for Finland

Text: Johanna Summanen
Photo: Tarja Vänskä-Kauhanen



Päivi Törmä points out that the utilisation of nanotechnology is an integral part of other innovative research.

New materials, alternative energy sources and their related technologies offer an opportunity for Finnish research and innovations to succeed also in the future. Finland's strengths lie particularly in various material surface technologies, printed electronics and in the high-level utilisation of both wood and biomass. New carbon and biomimetic materials are also considered crucial further down the road.

“Making good use of nanotechnology is an integral part of other innovative research,” explains Professor **Päivi Törmä**, one of the Materials panel's two chairs.

Driving forces in conventional raw material reserves create opportunities for the development of alternative materials with higher-quality properties. Increasing the degree of the processing of traditional industrial products is

Finland's answer to, for example, the challenges brought about by the sufficiency of oil production and its attendant rise in prices.

“Materials production based on renewable raw materials is inevitable if you want to keep production costs in check. For example, the use of biomass in products replacing petroleum-based plastic is a strength on the international playing field,” says Törmä.

TECHNOLOGICAL TRANSFER A CHALLENGE

Panel members were concerned about how Finland as a nation could concretely benefit from new innovations. Technological transfer is currently insufficient. One particular problem is the consolidation of resources. When conducting top international research, researchers do not have adequate resources for the development of new business.

“Researchers should be able to take their time in conducting basic research on the development of new innovations, as business experts must focus their efforts on areas where they perform best. We need intermediaries between research and business, so that new innovations can be utilised as effectively as possible,” says Törmä.

Technological transfer can be improved by, for example, reforming financing structures, training professionals in technological transfer and increasing the level of cooperation between chains of actors. ■

End of the road for national science policy

Text: Tiinu Wuolio

Photo: Mauri Ratilainen

The objective of the Global Economy panel was to flesh out operating frameworks for other Finnsight panels, whilst examining challenges facing global economy research. It was not clear whether developments were to be looked at from the point of view of one country or the entire world economy.

“There’s a certain amount of tension stemming from whether things should be examined in terms of the interests of one’s own country or those of the international community,” admits one of the Global Economy panel’s two chairs, **Pekka Ylä-Anttila**, Research Director at the Research Institute of the Finnish Economy ETLA.

The panel decided to take the Finnish perspective, despite the fact that one of the key issues under consideration was the more effective utilisation of international data reserves.

“Finland has opened up fairly late compared to other Nordic countries. While Finland may be fairly advanced in corporate globalisation, it’s lagging behind in other areas,” says Ylä-Anttila.

“Our research system is too national. All avenues should be opened and we have untapped resources in the form of foreign students and, particularly, doctoral students,” explains Pekka Ylä-Anttila.



Because Finland produces just under one per cent of the world's data, it relies on information produced elsewhere to promote its economic well-being. The research and innovation system is being subjected to increasingly tough requirements for internationalisation and specialisation.

"The national science policy has reached the end of the road. Even though Finland is one of the world's leading countries in terms of research investment, the focus must be shifted from quantity to quality," says Ylä-Anttila.

He would especially increase the number of foreign doctoral students in Finnish universities.

"In order for attractive research units and areas to be established in Finland, they'd have to be staffed by experts from Finland as well as from other countries. Know-how attracts know-how."

GREATER UNDERSTANDING OF THE WORLD ECONOMY AND CULTURES

Corporate representatives on the Global Economy panel were interested in the outlook for growing markets, whereas representatives of the public sector looked at matters in terms of cooperation between institutions and states. Academic research sought a broader perspective, which comprises income and population distribution, as well as the possibility for political conflicts and their management. A common viewpoint was related precisely to the stability and predictability of conditions in different regions.

"Research on developing economies and international politics or economics should be increased in Finland. This is also a matter of cross-cultural communication and the ability to communicate," states Ylä-Anttila.

During a ten-year period in a global operating environment, population growth is a given. The population in India is growing whilst the population of Europe is shrinking and ageing. The population of the United States remains stable and in Africa it is exploding. Life expectancy in Russia has decreased in recent years and continues to drop, and also the birth rate is low.

"This results in a push to migrate from poor areas to more affluent ones. Wealthy countries need labour, which is only available from regions experiencing major population growth. However, attitudes toward immigration policy in Finland and many other countries are undefined," notes Ylä-Anttila.

At the same time, climate change is having both economic and social impacts, and the world's energy economy is undergoing dramatic changes. These present both challenges to science and business opportunities for technology companies. The development of alternative forms of energy will also continue for decades. ■



Hanna Hentinen/Gorilla



The future of health care is in prevention

Text: Marja Keränen

Problem prevention and the promotion of health will rise to become the linchpin of Finnish health care and welfare policy in the next few years.

“The prospective changes will primarily be affected by the proliferation of information and its increasing availability to larger numbers of people. Science and research are the two most international sectors of society,” explains Professor **Jussi Huttunen**, referring to the impact panel’s report.

According to Huttunen, some of the problems and challenges facing the public social welfare and health care system in the next few years will be state and municipal economies, the productivity of the service system, the controlled implementation of new technologies, and labour shortages. The greatest health threat is the use of drugs and other addictive substances. Changes in the age structure and increasing levels of demand have placed great strains on the cost structure.

“The public system can be maintained at current levels and expanded only if its productivity is improved and new technologies

are used sensibly. If the system is of a high quality and has reasonable costs, services can also be sold to other EU countries and even outside of the EU,” says Huttunen.

He notes that Finland has benefited a great deal from globalisation. Even though exports have been the foundation of the welfare state, the balance can only be maintained if the export sector stays competitive and if employment improves.

BREAKTHROUGH IN INFORMATION TECHNOLOGY

A large number of parallel information systems have been developed in social welfare and health care. According to Huttunen, technology has altered service system structures and operating methods, but the ultimate breakthrough of new technologies will not happen for another 5–10 years.

“Technology should be analysed based on the needs of people and services. We’ve now developed

hundreds of systems simultaneously, and it's quite a job ensuring that they're sufficiently compatible. However, the development work has been a necessary phase, because the knowledge and experience gained from it could be used to establish common rules," emphasises Huttunen.

RESEARCH KEEPS A CAP ON COSTS

Huttunen points out that one of the most effective ways to improve the impact of the social welfare and health care system and curb the costs is to invest in research and development. Resources are also needed for basic research, which can be used to predict and solve future problems.

According to the working group's estimate, the biggest breakthroughs of the next decade will take place in biomedicine, imaging research, brain research and possibly in nanotechnology and stem cell research.

"For example, cancer therapies will undergo radical changes. The new, tailored therapies are effective, but extremely expensive," says Huttunen. ■

Focus on information technology end-users

Text: Tiinu Wuolio

Photo: Mauri Ratilainen

"When looking at a ten-year period, its makings probably already exist. The most difficult thing is to time how and when probabilities will occur," says one of the two chairs for the Information and Communications panel, Kari-Pekka Estola, Vice President of Nokia Research Center.

Rather than just monitoring trends, the panel went one step further to bring out the tacit knowledge of its members.

"It was important to step outside the box and try to see the areas that don't have any supporters," says Estola.

The Information and Communications panel conducted an extensive survey of sciences, technologies and approaches that support the acquisition, processing and dissemination of information. Its themes included telecommunications technology sectors, data mining, user interface research, neurosciences and communications linguistics.

FROM USER TO CONTENT PRODUCER

When defining themes, the panel also gave consideration to human receptiveness. In addition to the

ubiquitous abundance of communications, it can be affected by, for example, junk mail or the force feeding of messages.

"The users of a terminal should naturally be able to determine what they want to receive in any given situation," states Estola.

Information and communications processes are not one-way avenues – people themselves are becoming the content producers. The mining, storage and utilisation of information produced in an unconventional way are also emphasised. Users also determine where and in what way the new possibilities of a technology are to be implemented.

"Indeed, the Living Lab, where new products are developed together with end-users, is becoming more common," says Estola.

RESTRUCTURING OF TRADITIONAL INDUSTRY AND SERVICES

Even though new technological solutions are constantly being introduced, existing technologies are also being continuously developed. In print communications, for example, there is no clear continuum between traditional and new technologies as there is in the telecommunications industry, which makes it difficult to determine possible user preferences.

“Even in the future, paper can serve as a platform for communications, but new things, such as animation, will be integrated into it. How ready are people to accept it in that form? Not even in telecommunications should new technologies be pushed onto a market without some pull,” says Estola.

Estola mentions some of the most important themes tackled by the panel, such as the restructuring of traditional industry and the developmental needs of the service sector, achieving deeper change in them.

“Increasing productivity through new technologies must be taken seriously,” he stresses.

Digitalisation means a major breakthrough, which is realised in a long wave through several areas. Production methods develop and alter the role of traditional actors in, for example, print communications, as has already been seen in the music industry.

“So many things are going to be done in a completely different way ten years down the road. It’s important that choices aren’t forced. Change is always a possibility,” says Estola. ■



“International research cooperation must be taken to a depth where reciprocities are formed. We must ask what we can give to others so that we might receive something in return,” says Kari-Pekka Estola.



“International cooperation isn’t a value in itself, but it should create a win-win situation where scientists and researchers from the countries involved genuinely benefit from the cooperation”, Dr Ritva Dammert says.

New unit created to develop programme operations

Text: Riitta Tirronen
Photo: Anita Westerback

The Academy of Finland has established a new Programme Unit to support the operational planning and development of research and Centre of Excellence programmes. Dr Ritva Dammert, Director of the new Unit, says its main function is to improve the preparation of programmes and to emphasise their interdisciplinary and multidisciplinary orientation – without forgetting the requirement of programme coherence.

The preparation of Academy research programmes is centrally managed by a new Programme Unit that started in summer 2006. Most proposals and ideas for research programmes come from the research community in a bottom-up process, passing through the Academy’s Research Councils before preparations get underway.

“Our aim is to clarify the reasons as to why it would be useful to have a research programme in this particular field of research. We

also try to consider this from the vantage-point of the potential end-users of the knowledge generated,” Ritva Dammert explains.

In preparing new research programmes the Programme Unit works closely with both the Academy’s Research Councils and Research Units. In a rather crude nutshell, the division of labour between the Research Councils, Research Units and Programme Unit is one where the Research Units have charge of the substance and content of the programmes, while the Programme Unit has charge of the process.

A new element working closely with the Programme Unit in the preparation of research programmes is the so-called TUTOR group, which consists of representatives of Academy management as well as two representatives from each of the Academy’s four Research Councils, thus ensuring the presence of the research community’s interests.

“The TUTOR group’s job is to sift out initiatives from proposals made by Research Councils and where necessary to tie together different subjects and research ideas. This cooperation has been excellent,” Dammert says.

Each year the Academy of Finland has some 15 ongoing research programmes, which are scheduled to run at least for four years. Funding comes not only from the Academy, but also from other bodies such as Tekes, the Finnish Funding Agency for Technology and Innovation, and various ministries.

Research programmes may be grounded in concerns arising from science or society in general, or both. Programme initiatives may grow out of internal development needs within a certain discipline or field of research, needs to support a new, emerging field, or out of needs to create new knowledge about an issue that is thought to have great

significance for society.

National Centre of Excellence programmes have been running since 1995, and currently 39 Centres of Excellence are being funded through two such programmes. Applications to the 2008–2011 Centre of Excellence programme are now in the review process of the second application stage.

In practice, the Programme Unit’s duties include preparing the calls for applications to research and Centre of Excellence programmes, organising and coordinating the review of applications, drafting, implementing and monitoring decisions, organising programme evaluations and coordinating research programmes.

INTERNATIONAL COOPERATION

The Academy of Finland works systematically to find new international partners for its research programmes at the preparatory stage. The aim is to facilitate genuine cooperation between Finnish and foreign researchers that offers maximum benefit to both parties.

“International cooperation isn’t a value in itself, but it should create a win-win situation where scientists and researchers from the countries involved genuinely benefit from the cooperation,” Ritva Dammert says.

The bilateral agreements that the Academy has signed with research funding bodies from a number of different countries provide a sound foundation for international cooperation through research programmes.

“We don’t create these contacts on our own, but make use of researchers’ existing networks and listen to their suggestions. The Academy can then contribute to facilitating cooperation through its agreements, for instance.”

Dammert points out that each programme has its own distinctive dynamics and structure. Therefore, sometimes it is only at later stages

of the programme that international partners will join in through their own projects. This was the case in the Baltic Sea research programme, for instance, where joint projects with Russian researchers were started up somewhat later than other projects.

RESEARCH PROGRAMMES PROVIDE PLATFORMS FOR TRAINING

Questions of research impact are receiving much discussion today, and the goal of generating an impact is certainly present in research programmes as well. According to Ritva Dammert, the assessment of the scientific and particularly the social impacts of research programmes is an extremely challenging task as the impacts of many of the basic research programmes funded and administered by the Academy do not show up until years later.

“However, one may well think of research programmes as having different kinds of impacts, starting from the generation of new research knowledge and laying the foundations for new, multi-disciplinary research cooperation. Representatives of the end-users of new research knowledge are often involved in research programme groups, and they pass on that knowledge to decision-makers and various sectors of society. This is clearly an instance of social impact.”

Dammert also stresses the importance of research programmes as a platform for the training and education of new experts, as doctoral theses are often researched in the context of these programmes, for example. ■

Living in a foreign country can be both exciting and frustrating. It's a stimulating experience to live in a new environment, to make new friends and to get emerged in the gears of a different culture. Having lived in China, Germany, the United States and now Finland, I value this experience very much and tend to think of it as an opening up of new horizons. There are certainly also times when settling down feels difficult, complicated, and very slow. Misunderstandings, lack of information and lack of language skills can cause setbacks and make things clumsy. Inevitably, one is also confronted with one's own outsidership or foreignness, which stubbornly lingers on. If living in a foreign country isn't always easy, it gets even more complicated when working in a university in a foreign country. Universities have their own ways: they are conscious of their own traditions and have strong inside cultures. Universities everywhere are quite unique organisations and not always the most accessible ones for foreigners. It takes time, patience and determination to learn the most important procedures, structures and processes of making decisions.

I accepted an offer for a professorship in contemporary Chinese history at the University of Turku in August 2004. It turned out to be a big challenge. A Finnish professor has many obligations that go beyond teaching and include administration, degree development and coordination of research and teaching, international cooperation etc. Without proper knowledge of the Finnish language it took a lot of hard work to make myself familiar with the system of higher education, the processes inside the university and the subtleties of curriculums and exams. I also had to build up a support network, which is of course always very important.

But trying my best to take on the challenge also turned out to be very rewarding. My overall experience has been very positive. I always felt that there was a very positive attitude among colleagues and students towards a foreigner teaching at their university. Although I teach in English, students were very welcoming, too. I found Finnish students to be bright, interested and hard-working. Teaching them has been a very positive experience.

From the very beginning, a great deal of support was also offered by the university leadership. The Rector of the University, Keijo Virtanen, and the Dean of the Faculty for Social Sciences, Osmo Kivinen, both were always open to my concerns and pragmatically tried to work out solutions, if there were any problems. A few months after my arrival I developed a concept for the establishment of a Centre for East Asian Studies for strengthening and expanding the academic study of East Asia. Together with the Rector and the Dean a visit to the Ministry of Education was set up for obtaining extra funding for this project. It was approved and at the beginning of 2006 the Centre formally started its operations. I was also able to hire additional staff. We initiated new degree programmes in East Asian studies. With the support of all relevant parties we were able to start dynamic development that wouldn't have been possible elsewhere. In my experience, the University of Turku is a place that values initiatives and innovation.

Being an outsider or a foreigner can also help in seeing certain issues in a clearer perspective. There are areas where I think reforms would be necessary. The hiring process for professors, for instance, needs to be over-

hauled. The departments so far have almost no say in it. In my view, more attention has to be consistently paid to the profile of the respective department, to excellence in both research and teaching and to innovation. Second, more competition should be allowed between Finnish universities and within universities between different departments. All too often I encounter concepts advocating equal distribution between institutions and stakeholders. This isn't a promising policy for promoting academic achievement and success. And I also sometimes find the whole system of higher education in Finland too centralised and to give too little autonomy to universities, faculties and departments. Many decisions can be better made at the level where people are most concerned.

But as a whole, I don't at all regret coming to Finland. On the contrary: the two years in Turku have been exciting and fruitful. And I'm very optimistic about the future, too. ■

Klaus Mühlhahn
 Professor
 University of Turku



Kari Lehti

Mobility services for researchers growing rapidly

Text: Riitta Tirronen

The European Network of Mobility Centres, ERA-MORE, offers information and practical instruction to support the internationalisation of researchers. The services developed to promote researcher mobility will be supplemented as more and more national and local services are implemented. The result will be an extensive European mobility network that will make it easier for researchers to move abroad, work there and return to their home country.



The ERA-MORE network is supported by a mobility portal offering practical information on research and job opportunities and research funding in Europe. The portal also includes an excellent information package on legislation, social security, administration and cultural issues in different countries. The network strives to remove barriers to mobility that researchers have experienced over the years. Researchers have indicated that one of these barriers is a lack of information and its poor availability: practical information is scattered amongst various authorities and actors.

ERA-MORE is a joint project of EU Member States and comprises a number of national services, currently under construction in different countries. In Finland, the Academy of Finland is responsible for the network and portal. The Finnish website concentrates on

providing guidance for researchers arriving in the country, but also has something to offer researchers going abroad and returning to Finland. The portal includes information on the research landscape in Finland, research funding, job opportunities and studies as well as on work permits, housing, taxation, social security and the school system, information which has been gathered in cooperation with the University of Helsinki. The European portal also offers a chance to apply for international research positions. Such positions are presented on the website by country, and the search engine can be used to find open positions in specific fields.

As the network expands, the objective is for more and more universities and research institutes to launch their own local services and possibly their own mobility websites.

“We’re trying to bring the ser-

vice as close as possible to the researchers’ workplace, local university or research institute, as they themselves have requested in an Academy of Finland survey,” explains **Eeva Ikonen**, Senior Science Advisor at the Academy of Finland.

“The Academy functions as a kind of bridgehead to the mobility centres for European researchers while the national portal provides an information package and a channel to the other national portals. We want to do everything possible to support the universities, which handle the practical issues related to researcher mobility.”

According to a survey conducted by the Academy, the high quality of research is the most important incentive for a foreign researcher to come to Finland. However, Ikonen believes that practical matters can prevent a move to Finland, meaning that good services to support

Photo: Tero Suutari



Hanna Saarela says foreign researchers are eager for information about practical, everyday matters before moving to Finland.

Photo: Marko Karo



"The national portal gave us a good starting point for planning our own website", Pirita Posti says.



Photo: Johnny Korkman

"Good services to support researcher mobility may play a decisive role when people select the country to which they want to move", Eeva Ikonen believes.

researcher mobility may play a decisive role when people select the country to which they want to move.

THE UNIVERSITY OF ART AND DESIGN HELSINKI SHOWS THE WAY
Research activity at the University

of Art and Design Helsinki has been internationalising rapidly in recent years. This development can also be seen in the increased number of foreign graduate students and visiting researchers. At present, 17 per cent of doctoral students are foreign, and in the Media Lab depart-

ment, where the teaching language is English, the figure is 34 per cent. It is also notable that last year the majority of doctoral student applicants for the University of Art and Design Helsinki were from outside Finland. Members of the research staff are also increasingly likely to



be foreign and, for example, one-third of assistants come from outside Finland.

“The University of Art and Design Helsinki is highly respected internationally and the research conducted here receives a lot of attention. Our faculty’s professors are well-known and we receive plenty of applications from foreign students and researchers simply on the basis of their reputations,” says Project Coordinator **Pirita Posti** from the Research Institute at the University, as she explains the large international presence.

The University of Art and Design Helsinki is one of the first Finnish universities to create its own mobility site as part of the ERA-MORE network. As part of this pilot project, the University also implemented a world map on its mobility site, the purpose of which is to visualise the university’s research-based cooperation agreements. These represent one potential channel for research collaboration in general and for researcher mobility. Researchers have country-specific information at their fingertips.

“The national portal gave us a good starting point for planning our own website. A great deal of general information has been compiled there and we’re trying to complement it with our own services.”

The target group for the mobility website at the University of Art and Design comprises doctoral students and researchers. It contains a lot of practical information and reminder lists of what should be considered when moving abroad or coming to Finland. The website also provides details on sources of funding and the University’s own cooperation agreements as well as advice on writing a good application. Stories from researchers concerning their experiences while working abroad are a nice addition to the website.

“The open nature of the information is an important part of the con-

cept. Our goal was to address issues that often prevent researchers from moving abroad, and in this sense having the right information and receiving guidance emerged as the two most important issues.”

“Although our primary target group is doctoral students and researchers from our university, in the future we plan to extend the service to cover foreign research visitors arriving here. Another objective is for the website to serve as an indirect source of information for university staff.”

“During planning, and now as we develop the service, we constantly collect feedback and ideas from researchers concerning what kind of information they would like to have. Based on my experience so far, there’s a particular need for information on sources of financing,” explains Posti.

“We’ve already received contacts as a result of our mobility website, and hopefully there’ll be even more of them in the future.”

In addition to its mobility website, the University of Art and Design has arranged info sessions concerning researcher mobility, and these have proven to be very popular.

“Communication via the national mobility portal and the university’s own mobility website has also played an important role, and its significance shouldn’t be underestimated in this connection.”

“Last year the University of Art and Design took a big step towards promoting mobility. However, it’s a fact that increasing researcher mobility is a step-by-step process that requires patience. Moving abroad or to Finland should be important and worthwhile to the researcher in terms of the actual research. It’s important for each person to find the best university for him/herself and the most suitable research environment,” says Posti.

CWC IMPROVES INTERNATIONAL COOPERATION

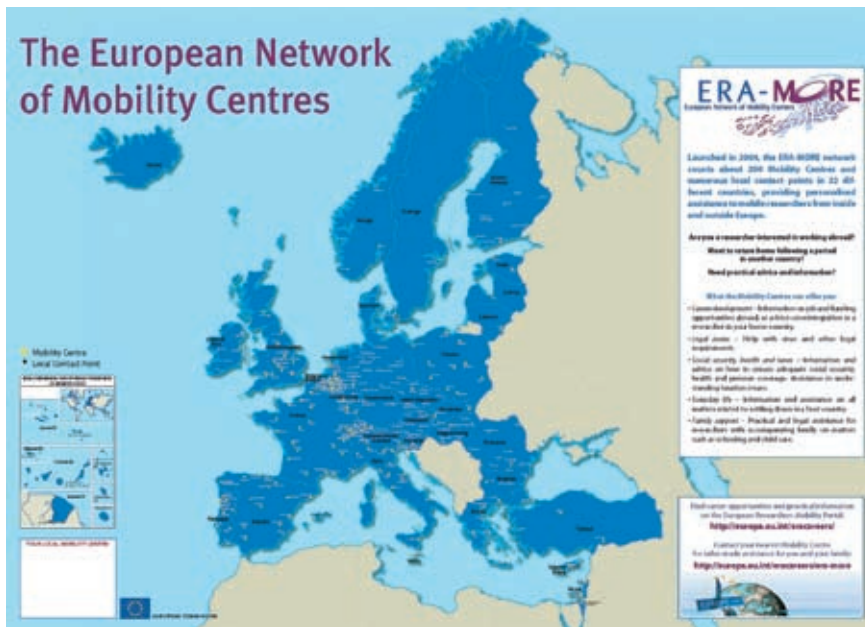
“It’s impossible to produce quality international publications or the high-quality research demanded by financiers without gifted researchers. The broad competence base needed for projects can’t be found inside Finland alone,” says Project Coordinator **Hanna Saarela** from the University of Oulu Centre for Wireless Communications Unit as she explains the principles of the unit’s international activities.

The Centre for Wireless Communications (CWC) unit, which operates in conjunction with the Telecommunications Laboratory at the University of Oulu, produces high-level research in close collaboration with industry. Research at CWC is related to data communications solutions for 3G evolution and 4G systems. The research topics include multi-carrier techniques, ultra wideband systems and software radio technology. The unit was established as a programme in 1995 and is completely dependent on external funding. The most significant financiers are the Finnish Defence Forces, Nokia, Elektrobit, Tekes and the European Commission.

“We have a staff of about 90 at this time and about 20 active projects. All the scientists we hire work on the projects in addition to their own studies, meaning that the project work and studies complement one another.”

According to Saarela, the CWC operating model allows for exceptionally close international cooperation and long-term research.

“Right now we have 18 foreign researchers from eleven countries working at CWC. The doctoral students spend at least three years here, post doc researchers at least one year, and visiting researchers are with us from a week to one year. Our unit also has three foreign professors that work part-time.”



“The visits of trainees, thesis students and visiting researchers are often funded by the organisation they come from, or they may have a personal grant. We compensate them for travel expenses or accommodation on a case-by-case basis,” describes Saarela.

GREAT NEED FOR PRACTICAL INFORMATION

Hanna Saarela explains that foreign researchers are eager for information about practical, everyday matters before moving to Finland.

“Common topics concern the weather and what to wear, housing, cost of living and cultural characteristics. People also want to know about the research project and topic ahead of time. It’s natural for people to be curious about their responsibilities in the project, the project content and publications, supervision and the objectives of the research. People coming to Finland are also interested in working hours and how holidays are determined.”

Organisations need a contact person to handle administrative issues and matters related to project content. At CWC the support staff

handle the practical arrangements while the project managers provide information about project-related issues. Each new arrival is assigned a buddy researcher who helps with work-related questions.

“People coming to Finland particularly need information about applying for a residence visa, registering with the Population Register Centre, finding accommodation and applying for permission to study. Many researchers also feel that they don’t receive enough support with family-related moving arrangements or with finding work for their spouse,” says Saarela.

“When a researcher is moving to Finland, we always make contact personally and answer any questions they may have. The University of Oulu website also includes information about Oulu and moving arrangements, and the package for researchers is currently being renewed for the entire university.”

THE STRENGTH OF AN INTERNATIONAL NETWORK

CWC has yet to use the ERA-MORE website to support recruiting, although it has been discussed.

“So far the CWC’s research cooperation agreements, former employees, partners and our own website have served as the marketing and recruiting channels for our programme. Publications by our researchers and various exchange programmes and grants have also piqued the interest of researchers.”

“CWC’s strength lies in its very broad international network. Information is effectively communicated by word of mouth, especially through partners and researchers that have worked at CWC.”

International cooperation also works in the reverse direction at CWC, as Finnish doctoral students and post doctoral researchers take part in projects at partner universities and companies outside the country. Visiting researchers have been in the USA, Europe and Asia. According to Hanna Saarela, a grant or partial funding from the receiving organisation has often made the visit possible. “All kinds of different cooperation activities are required in order to make researcher exchange possible,” she explains.

Saarela has noticed that project work adds its own challenge to recruiting foreign researchers. Work in a project team may only last a short time, which requires adaptability and the capacity to learn quickly, in terms of the researcher and the team.

“Differences in work cultures and habits have to be taken into consideration during induction. In practice, determining the researcher’s background and actual skills takes time and can make it difficult to specify the job description.” ■

- www.aka.fi/eng
- www.uiah.fi/english
- www.cwc oulu.fi
- www.ouka.fi/efa
- www.65degreesnorth.com
- www.europa.eu.int/eracareers

Research in focus during Finland's EU Presidency

During Finland's EU Presidency 1 July–31 December 2006, the Academy of Finland arranges six research-related expert meetings, partly in cooperation with the European Commission. Some of the meetings are those regularly arranged in the Presidency country whereas some of the meetings are arranged on Finland's initiative. More information on the meetings arranged by the Academy during Finland's EU Presidency at www.aka.fi/euseminars.

SCIENCE MEETS POLICY 'SMP'

8th European Workshop on Environmental Research and Environmental Policy Interface
19–20 October 2006
Helsinki
Academy of Finland/Leila Häkkinen

IMPACTS OF ENDOCRINE DISRUPTERS

8–10 November 2006
Radisson SAS Royal Hotel, Helsinki
Academy of Finland/Mikko Taipale

BALTIC SEA AND EUROPEAN MARINE STRATEGY – LINKING SCIENCE AND POLICY

13–15 November 2006
Helsinki
Academy of Finland/Kaisa Kononen
www.eu2006balticsea.net

ACTIONS FOR THE 2010 BIODIVERSITY TARGET IN EUROPE

– How Does Research Contribute to Halting the Biodiversity Loss? –
XVI EPBRS Meeting in 2006
16–19 November 2006
Hanasaari, Espoo
Academy of Finland/Heli Karjalainen

HUMANITIES IN THE ERA

22–24 November 2006
Finlandia Hall and Academy of Finland, Helsinki
Academy of Finland/Kustaa Multamäki

HELSINKI GROUP ON WOMEN AND SCIENCE

4–5 December 2006
Parliament of Finland, Helsinki
Academy of Finland/Hannele Kurki
Ministry of Education/Heidi Kuusi

ACADEMY OF FINLAND PUBLICATIONS

A number of reports are published in the Academy's publication series each year on aspects of science and research policy as well as on research funding and the state of scientific research. Recent reports in this series and other Academy brochures in English include:

■ Food Sciences and Related Research in Finland 2000–2004. International Evaluation.

■ Methods for Evaluating the Impact of Basic Research Funding: An Analysis of Recent International Evaluation Activity.

■ Development Research Strategy.

■ Research Programme on Finnish Companies and the Challenges of Globalisation (LIIKE). Evaluation Report.

These reports can be read on the web at www.aka.fi/publications in PDF format or ordered free of charge from the Academy's Communications Unit by phone on +358 9 7748 8346 or by email viestinta@aka.fi.



THE ACADEMY OF FINLAND

The Academy of Finland works to promote high-level research through long-term funding, reliable evaluation, science-policy expertise and global cooperation. The Academy is the major source of funding for basic research in Finland and accounts for 15 per cent of total government research funding. In 2006, Academy funding for research primarily at universities and research institutes amounts to around 250 million euros.

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

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

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

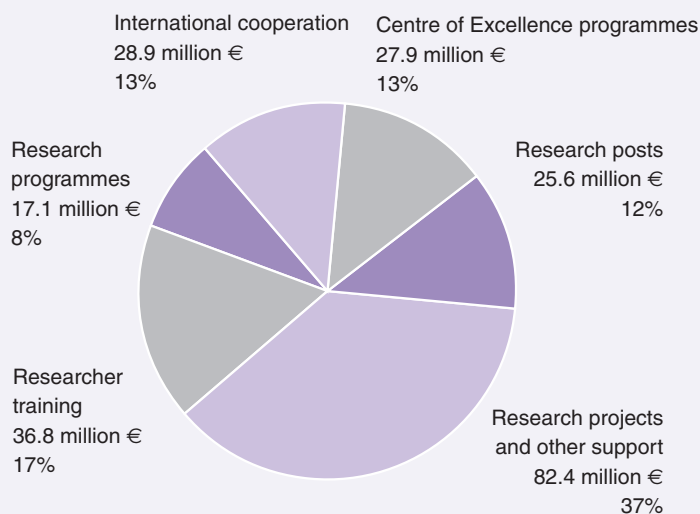
RESEARCH IN FINLAND

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

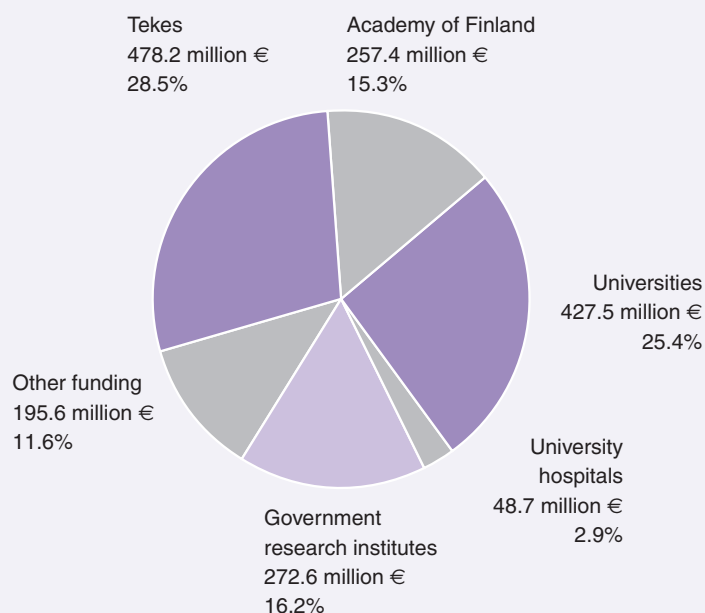
Finland has a very high level of research and development investment relative to GDP. R&D funding increased consistently in Finland throughout the 1990s. In 2005, the Government spent 1.6 billion euros on R&D. Finnish R&D expenditure as a proportion of GDP in 2005 stood at 3.5 per cent. Business R&D expenditure accounted for 70 per cent of total R&D investment.

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

FUNDING DECISIONS IN 2005, BY FORM OF FUNDING



GOVERNMENT R&D EXPENDITURE IN 2006





ACADEMY OF FINLAND

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