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RESEARCH PROGRAMME ON NEUROSCIENCE (NEURO) 2006–2009



Evaluation Report
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ACADEMY OF FINLAND
RESEARCH FUNDING AND EXPERTISE

RESEARCH PROGRAMME ON NEUROSCIENCE (NEURO) 2006–2009

Evaluation Report

Evaluation Panel

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ACADEMY OF FINLAND IN BRIEF

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Description

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Abstract	<p>In 2005, the Academy of Finland launched a new 4-year Research Programme on Neuroscience (NEURO) for 2006-2009. The aim of the Programme was to bring cohesion to the divergent disciplines and fragmented research efforts in neurosciences by establishing a truly multidisciplinary research programme, by promoting introduction of new methods and by supporting researcher training. An additional challenge for establishing the NEURO Research Programme was the requirement to involve also foreign research groups and funding organizations in the Programme. Consequently, the NEURO Programme was launched in partnership with the National Natural Science Foundation of China, and the Institute of Neuroscience, Mental Health and Addiction (INMHA) of the Canadian Institutes of Health Research (CIHR). The applicants were encouraged to establish international collaborations between neuroscientists from Finland, Canada and China, which would be jointly funded by the participating agencies. Additional aims of the Programme were to increase international mobility of researchers and to accelerate the exchange of new scientific knowledge among scientists and between scientists and other interest groups (e.g. policy makers, funding bodies, media and the general public). To help achieve these aims the Academy appointed an in-house Programme Coordinator for the NEURO Programme.</p> <p>In 2010 the Academy of Finland invited a panel of international experts to evaluate how the Programme had succeeded in reaching its goals. The panel consisted of the following scientists:</p> <ul style="list-style-type: none"> • Eero Vuorio, Biocenter Finland, University of Helsinki, Finland (chair) • Pierre Drapeau, Université de Montréal, Québec, Canada • Sten Grillner, Karolinska Institutet, Stockholm, Sweden • Zhi-Qi Xiong, Institute of Neuroscience, Shanghai, China <p>According to the evaluation panel the Programme had promoted networking and new forms of collaboration between researchers in the participating countries, and stimulated their mobility. The Programme had also provided positions for doctoral and postdoctoral level researchers and supported the career development of junior scientists. Also, neuroscience-related communication especially with the general public was greatly accelerated during the Programme. However, an attempt to analyze the added value of the Programme was difficult as most research groups received simultaneously substantial amounts of funding from other sources. This probably explains why so much was achieved with a relatively modest level of Programme funding. As a summary the panel concluded that although the objectives of the NEURO Programme were very ambitious and challenging, many of them were achieved.</p>		
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Tiivistelmä	<p>Suomen Akatemian vuonna 2006 käynnistämän Neurotieteen tutkimusohjelman (NEURO) keskeisenä tavoitteena oli alalle luonteenomaisen monitieteisyyden tukeminen. Nelivuotisella NEURO-ohjelmalla haluttiin lisätä neurotieteellisen tutkimuksen eri osa-alueiden yhteistyötä, tiivistää alan hajanaisia tutkimusympäristöjä, kannustaa uudenlaisten tutkimusmenetelmien soveltamiseen sekä tukea monipuolista tutkijankoulutusta. Lisäksi ohjelmalta edellytettiin kansainvälistä tutkimusrahoittajien yhteistyötä. Ohjelma toteutettiin yhteistyössä Kanadan INMHA (Institute of Neuroscience, Mental Health and Addiction) ja Kiinan NSFC (National Natural Science Foundation of China) -rahoittajaorganisaatioiden kanssa osallistujamaiden neurotutkijoiden verkottumisen ja yhteistyön sekä liikkuvuuden lisäämiseksi. Ohjelman toivottiin tehostavan myös tiedonkulkua ja tutkimustuloksista tiedottamista tutkijoiden ja muiden intressiryhmien keskuudessa. Asetettujen tavoitteiden saavuttamiseksi Akatemia nimesi ohjelmapäällikön vastaamaan ohjelman koordinaatiosta.</p> <p>Vuonna 2010 Suomen Akatemia kutsui koolle kansainvälisen asiantuntijapaneelin arvioimaan ohjelmalle asetettujen tavoitteiden toteutumista. Paneeli koostui seuraavista henkilöistä:</p> <ul style="list-style-type: none"> • Eero Vuorio, Biocenter Finland, University of Helsinki, Suomi (puheenjohtaja) • Pierre Drapeau, Université de Montréal, Québec, Kanada • Sten Grillner, Karolinska Institutet, Stockholm, Ruotsi • Zhi-Qi Xiong, Institute of Neuroscience, Shanghai, Kiina <p>Arviointipaneelin näkemyksen mukaan ohjelma kannusti siihen osallistuneita neurotutkijoita kansainvälisyyteen, liikkuvuuteen ja uudenlaiseen tutkimusyhteistyöhön. Ohjelman havaittiin tukeneen erityisesti nuorempien tutkijoiden urakehitystä ja lisännen tohtorikoulutettavien ja tutkijatohtoreiden palkkaamista tutkimushankkeisiin. Myös suurelle yleisölle suunnattu neurotieteeseen liittyvä viestintä lisääntyi ohjelmakaudella merkittävästi. NEURO-ohjelmarahoituksen osuus tutkimusryhmien kokonaisrahoituksesta oli kuitenkin vähäinen, joten paneelin käsityksen mukaan suurin osa raportoiduista tutkimustuloksista on tuotettu muun kuin ohjelmarahoituksen turvin ja täten ohjelman tuottaman lisäarvon analysointi on haastavaa. Yhteenvetona paneeli totesi, että vaikka NEURO-ohjelmalle asetetut tavoitteet olivat kunnianhimoisia ja haastavia, niistä suuri osa onnistuttiin toteuttamaan ohjelmakaudella.</p>	
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PREFACE

In 2005, the Academy of Finland launched a new 4-year Research Programme on Neuroscience (NEURO) for 2006–2009. The aim of the Programme was to bring cohesion to the divergent disciplines and fragmented research efforts in neurosciences by establishing a truly multidisciplinary research programme, by promoting introduction of new methods and by supporting researcher training. An additional challenge for establishing the NEURO Research Programme was the requirement to involve also foreign research groups and funding organizations in the Programme. Consequently, the NEURO Programme was launched in partnership with the National Natural Science Foundation of China, and the Institute of Neuroscience, Mental Health and Addiction (INMHA) of the Canadian Institutes of Health Research (CIHR). The applicants were encouraged to establish international collaborations between neuroscientists from Finland, Canada and China, which would be jointly funded by the participating agencies. Additional aims of the Programme were to increase international mobility of researchers and to accelerate the exchange of new scientific knowledge among scientists and between scientists and other interest groups (e.g. policy makers, funding bodies, media and the general public). To help achieve these aims the Academy appointed an in-house Programme Coordinator for the NEURO Programme.

After the NEURO Programme ended, the Academy of Finland invited in 2010 a panel of international experts to evaluate how the Programme had succeeded in reaching its ambitious goals. The panel consisted of the following scientists:

- Sten Grillner, Karolinska Institutet, Stockholm, Sweden
- Pierre Drapeau, Université de Montréal, Québec, Canada
- Eero Vuorio, Biocenter Finland, University of Helsinki, Finland (chair)
- Zhi-Qi Xiong, Institute of Neuroscience, Shanghai, China

Dr. Eeva Sievi from the University of Helsinki served as an expert secretary of the evaluation panel. The panel met in Helsinki on September 29 - October 1, 2010. For the evaluation the principal investigators of the funded projects had been invited to provide their final reports and to fill out a self-evaluation form. The programme Coordinator and other staff members of the Academy of Finland also provided data about the application and selection processes and of the funded projects. During the visit the panel interviewed and discussed with key individuals in the Academy of Finland involved in planning and implementation of the Programme including the Programme Coordinator, Dr. Mika Tirronen, and with selected scientists who had participated in the Programme.

This report presents the results of the evaluation and some recommendations of the evaluation panel.

Helsinki, October 2010

Eero Vuorio

Professor, Chair of the Evaluation Panel

I BACKGROUND

The Research Programme on Neuroscience (NEURO) was launched for the years 2006–2009 by the Academy of Finland, in partnership with the National Natural Science Foundation of China, and the Institute of Neuroscience, Mental Health and Addiction (INMHA) of the Canadian Institutes of Health Research (CIHR).

Neuroscience is a broad and multidisciplinary field with fast-developing technology. The NEURO Programme was introduced to strengthen the field by bringing fragmented research environments together, by promoting the introduction of new methods and by supporting versatile researcher training. In addition, the NEURO Programme encouraged researchers for international collaboration via providing joint funding for neuroscientists in Finland, Canada and China.

The core themes of the NEURO Programme were:

- Molecular and Cellular Neuroscience,
- Nervous System Development, Plasticity and Repair,
- Systems and Cognitive Neuroscience,
- Diseases of the Nervous System,
- Neuroinformatics and Neurotechnology, and
- Ethical, Philosophical and Socio-Cultural Aspects Related to Neuroscience.

Programme goals

According to the Research Programme Strategy 2003–2008 of the Academy of Finland a research programme is composed of a number of research projects that are focused on defined subject area or set of problems scheduled to run for a set period of time with coordinated management. A programme is to be sufficiently broad with a well-defined focus and adequate duration, and it should provide added value when compared to traditional funding of individual projects.

Objectives of the NEURO Programme were:

- to promote high-quality multi- and interdisciplinary research in neuroscience in the participating countries,
- to establish more effective networking and collaboration between researchers in Canada, China and Finland,
- to enhance the application of advanced technologies in neuroscience,
- to stimulate mobility of researchers between the countries,
- to promote researcher training (special scope for young scientists),
- to establish new forms of research collaboration, and
- to accelerate the exchange of new scientific knowledge among scientists and between scientists and other interest groups (e.g. policy makers, funding bodies, media and the general public).

Coordination

The NEURO Steering Committee was nominated in 2004 for designing the Programme strategy. The tasks of the Committee included submission of the proposals for projects to be funded to the responsible funding bodies, steering and monitoring the function of the Programme, planning and organizing the final evaluation of the Programme, and promoting the utilization of the research results.

The Steering Committee had four representatives from the Academy of Finland (one from each research council), two representatives from the NSFC, and one from the INMHA. The committee was chaired by professor Kalervo Väänänen (Academy of Finland), and vice-chaired by Han Jianguo (NSFC) and Astrid Eberhart (INMHA). Professor Olle Lindvall from the University of Lund, Sweden was invited as an external expert to strengthen the scientific expertise, especially in the initial phase of the Programme, when the objectives were set and the funding decisions made. The Committee participated the initial phase of the Programme actively. After the onset of the Programme the Committee met once in Finland and once in Canada. The final meeting will take place in China after the completion of the Programme in October 2010.

The programme management was conducted by the Academy of Finland in cooperation with INMHA and NSFC. At the Academy of Finland Programme Manager, Dr. Mika Tirronen was in charge of managing and coordinating the Programme. The representatives of INMHA and NSFC coordinated the national activities within Canada and China, respectively.

Funding partners and principles

Based on the Academy of Finland policy launched in early 2000's the Research Programmes were required to promote international collaboration also at the level of funding organizations. Negotiations with several foreign funding organizations in Europe and elsewhere were conducted during the preparatory phase of the NEURO Programme. These negotiations coincided, however, with those for the establishment of an ERA-NET Neuron in January 2007 with funding from the 6th EU Framework Programme. As most of the European funding bodies (including the Academy itself) decided to join the ERA-NET Neuron, the Academy of Finland initiated negotiations with funding organizations outside of Europe. These led to closer contacts with the Institute of Neurosciences, Mental Health and Addiction (INMHA) of the Canadian Institutes of Health Research (CIHR), and with the National Natural Science Foundation of China (NSFC). Both INMHA and NSFC decided to join the NEURO Programme after which a joint programme memorandum was written. Other countries contacted were not in a situation to join the NEURO Programme within the time required limits.

The Canadian Institutes of Health Research (CIHR) is the major federal agency responsible for funding health research in Canada. The Institute of Neurosciences, Mental Health and Addiction (INMHA) is one of the 13 institutes of CIHR. INMHA supports research on the functioning and disorders of the brain, the spinal cord, the sensory and motor systems and the mind. (www.cihir-irsc.gc.ca).

The National Natural Science Foundation of China (NSFC) was founded in February 1986 with the approval of the State Council. It is an institution for the management of the National Natural Science Fund, aimed at promoting and financing basic research and some applied research in China. Ever since its establishment, NSFC has continuously stressed the importance of international cooperation and exchange (www.nsf.gov.cn).

Each funding body supported the research teams based within their own country. Although recommendable, international collaboration was not a prerequisite for receiving Academy's funding from the Programme.

2 EVALUATION PROCEDURE

The call for the NEURO Programme in 2005 resulted in 107 collaborative project proposals presented in altogether 170 applications. The majority of the project proposals were between Finnish research groups, 12 of them were Finnish-Canadian, and 10 Finnish-Chinese. Two proposals were from trilateral consortia containing teams from all participating countries.

The applications were evaluated by two international panels, one for molecular and clinical neuroscience chaired by professor Tomas Hökfelt (Karolinska Institutet, Sweden), and a second including imaging, neuroinformatics and neurotechnology chaired by professor Sten Grillner (Karolinska Institutet, Sweden). The panels had nine and eight members respectively. The members were mostly Europeans and well selected to provide a high level of complementary expertise within each panel. The format of the applications was that of the standard Academy of Finland project funding adapted to the specific goals of the NEURO Programme and the added value of the collaborative efforts.

The background material provided to the panelists by the Academy of Finland and the panel routines were quite appropriate, which helped the work of the panels and made their work efficient. The interaction within each panel was also efficient with constructive discussion leading up to consensus in the scoring of the different projects, despite the highly competitive nature of the NEURO Programme.

The consensus scoring of the panels was translated to funding decisions by the Steering Committee. Altogether 23 projects of 107 project proposals (21.5 %) were approved for funding. Six of the funded projects were conducted by individual Finnish teams, ten were national consortia, four were Finnish-Chinese and three Finnish-Canadian projects. The Academy of Finland allocated 7.1 million euros, INMHA 250 000 euros and NSFC 350 000 euros to the Programme. Each funding organization funded only teams located in their own country. For the summary of the call parameters, see Table 1.

Table 1. Summary of the call for the NEURO Research Programme

Call parameter	
Number of project proposals	107*
Number of funded projects	23**
<i>Finnish projects</i>	16
– individual projects	6
– consortia	10
<i>Finnish-Chinese Projects</i>	4
<i>Finnish-Canadian Projects</i>	3
Success rate (% of projects)	21,50
Average funding/4-year project	
<i>Academy of Finland (eur)</i>	173 000
<i>NSFC (eur)</i>	87 500
<i>INMHA (eur)</i>	84 000

* the 107 project proposals were presented in 170 applications

** the 23 funded projects encompassed joint efforts of 41 research groups

3 SCIENTIFIC QUALITY AND IMPACT OF THE PROGRAMME

The funded projects fell into 6 categories: molecular and cellular neuroscience; development, plasticity and repair; systems and cognitive neuroscience; diseases; neuroinformatics and neuroethics (Figure 1).

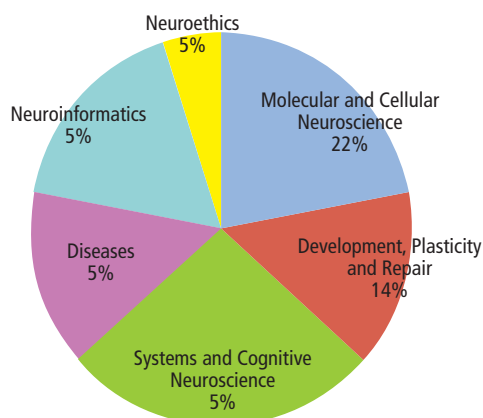


Figure 1. Funded projects by the themes of the NEURO Programme

While still early to judge, objective indications are that the projects have to date been successful. Final reports are available from 32 out of the 41 (78%) groups funded. They report over 250 publications of which over 50 (roughly 20%) resulted from project-related collaborations, including a dozen from international collaborations. The proportion of collaborative discoveries is expected to increase as further work is published. Eight patents have been filed, though to what extent they resulted from this Programme is unclear. Finally, half the groups reported that they have since secured additional funding for their collaborations. Together these data indicate that overall the Programme has been a success. Summary of the Programme outcomes is presented in Table 2.

Table 2. Outcomes* of the Programme

Type of outcome	Number
Scientific publication	250
Collaborative publication	53
Doctoral dissertation	27
Patent	8
Seminar	11
Person months paid	1330

* according to the final project reports by project leaders (reporting activity 78%)

4 SUCCESS OF IMPLEMENTATION OF THE PROGRAMME

As already discussed above, the major tasks of the Steering Committee of the NEURO Programme were related to the planning stages of the Programme, and to the decision on the projects to be funded. A decision was made to allocate approximately 170.000 € for four years to the projects funded by the Academy. All funded projects were rated 4.0 (out of 5) or higher, while 11 other projects in this category (mostly studies on disease mechanisms) were not funded. This high ranking reflects the quality of the proposed projects.

Essentially all research groups receiving funding from the NEURO Programme complained about the low level of funding. Many reported that this low funding level and its short duration were not in line with the ambitious goals of the Programme. In average the funds were sufficient for the salary of one doctoral candidate or postdoctoral researcher, which was reported to be insufficient for carrying out the research described in the proposal. Funding by the collaborating international partner organizations was even lower. On the other hand, for 80 % of Finnish research groups (33/41) funding through the NEURO Programme was supplementary to other Academy of Finland funding. A large majority of the groups (78 %) reported that NEURO funding was less than one-quarter of their total research funding. These facts were obviously also known when the funding decisions were made. Interestingly, despite the criticism even the low-level funding from the NEURO Programme was viewed positively: 56 % of the groups estimated that NEURO Programme funding had helped them obtain additional funding for their project.

Attempts to analyze the added value of the Programme have to take into account the fact that most research groups received simultaneously substantial amounts of funding from other sources. Three important observations were made during the final evaluation of the Programme. (1) In some cases NEURO funding to consortia has brought junior and senior principal investigators together which has been important for the career development of the junior researcher during the funding period. (2) NEURO funding appears to have promoted collaboration of basic scientists and clinicians, which was viewed positively by the panel. (3) Most of the international collaborations initiated during the Programme were new, and had continued also after the conclusion of the Programme. The Programme thus appears to have increased inter- and multidisciplinary and internationalization of the participating research groups.

Once the funding decisions were made, the role of the Steering Committee reduced and the Programme Coordinator became responsible for practical running of the Programme. The Coordinator of the NEURO Programme, Dr. Mika Tirronen, had previous experience from coordinating another large research programme of the Academy (Life2000) where the task was externalized to the Institute of Biotechnology, University of Helsinki. The new in-house arrangement of

coordination was seen very beneficial for information exchange within the Academy of Finland and particularly for the establishment of the interactions with the Canadian and Chinese funding agencies. The successful outreach activities can probably also be partially explained by the close links between the coordinator and the Communications Unit of the Academy. However, the new arrangement of in-house coordination was not without negative aspects as it physically removed the coordinator from the scientific community. Working in house the coordinator has received additional responsibilities such as other programmatic and international coordination tasks which have reduced his possibilities to focus on the activities of the NEURO Programme when compared with his earlier task of coordinating the Life2000 Programme.

5 RESEARCHER TRAINING WITHIN THE NEURO PROGRAMME

Research groups participating in the NEURO Programme reported a total of 27 doctoral degrees that were at least partially supported by the Programme. Based on the final reports received by the Academy of Finland (reporting activity 78%), the NEURO Programme funds were used to support a total of 1330 person-months; of these 53 % were for researchers working towards their doctoral degree and 36 % for postdoctoral level researchers. Thus, the NEURO Programme included a significant researcher training component particularly at the doctoral training level. Doctoral training has taken place in collaboration with several graduate schools mostly under the FinBioNet umbrella. A considerable proportion of doctoral trainees and postdoctoral researchers have been of foreign origin (21/74). Based on the self-evaluation reports, the international visits funded by the NEURO Programme have been beneficial to researcher training.

The NEURO Programme participated in researcher training also by organizing annual multidisciplinary NEURO seminars and a joint NEURO-FinBioNet seminar on Research Ethics. In addition, workshops were organized in China, Japan and the US. Apparently due to the limited time allotted to the coordination of the NEURO Programme by the Academy, the Programme was somewhat less active in organizing courses and seminars as compared to some earlier research programmes of the Academy (e.g. Life 2000). The diversity of the interdisciplinary Programme would have required substantially more time and effort to allow an efficient communication between researchers with different background training. In the self evaluation reports the participating Finnish research groups consider the aim of the Programme to promote interdisciplinarity a very valuable goal, but the joint seminars were criticized for lack of focus and lack of themes of sufficient interest to the participants representing diverse backgrounds.

6 NATIONAL AND INTERNATIONAL COLLABORATION AND NETWORKING

The goals of the NEURO Programme, to promote high quality collaborative research in neuroscience and to establish effective networking between neuroscientists as well as to stimulate mobility of researchers between countries, were certainly reached. The Programme favored applications from consortia of laboratories. These involved groups from different institutes with complementary expertise. Seven projects were engaged in international collaboration. The panel felt that the Programme Manager Mika Tirronen did an impressive and challenging job to successfully establish international connections with the National Science Foundation of China (NSFC), the Chinese Academy of Sciences (CAS) and the Canadian Institutes of Health Research (CIHR). The selection of China and Canada was based on their interests and willingness about the co-operation. The selection of these two important countries coincided with the establishment of ERA-NET Neuron and therefore European partners had another route for interaction. Other international partners were also approached but for practical reasons other collaborations could not be initiated within the timeframe of the Programme.

Researcher mobility is essential for successful collaboration and effective communication. To promote mobility, the NEURO Programme organized seminars and meetings in different countries and encouraged exchange of graduate students and postdoctoral researchers between international research laboratories. In 2008, the NEURO Programme together with some other neuroscience-related programmes organized a joint booth in the Society for Neuroscience meeting in Washington DC. In 2009, the Programme organized a joint seminar with RIKEN Brain Science Institute in Japan and supported the 2nd Sino-Finnish Life Science Forum in Finland. During 2005–2009, there were 36 visits between laboratories for the 7 international collaborative projects, resulting in 12 joint publications. The NEURO Programme clearly served as an efficient mechanism for promoting researcher mobility. The panel feels that special infrastructure should have been implemented to further increase the mobility of researchers, primarily, individuals early in their research careers. Table 3 sums up the parameters of international collaboration in the NEURO Programme.

Table 3. International collaboration*

Collaborative activity	
Number of international collaborative projects in the NEURO Programme	7
Number of Finnish-Chinese projects	4
Number of Finnish-Canadian projects	3
Total number of publications in the international collaborative projects	75
Total number of publications in the Finnish-Chinese projects	51
Total number of publications in the Finnish-Canadian projects	24
Total number of joint publications in the international collaborative projects	12
Number of joint publications in the Finnish-Chinese projects	8
Number of joint publications in the Finnish-Canadian projects	4
Number of visits between the laboratories	36

* according to the final project reports by project leaders (reporting activity 78%)

7 SOCIETAL IMPACT OF THE PROGRAMME

The Coordinator and the Communications Unit of the Academy of Finland have done very impressive work in providing outreach to the society concerning Neuroscience and in particular the research conducted by the researchers within the NEURO Programme (Table 4).

The Academy has worked not only through its web-site, newsletters and press releases, but also by having annual brunches with the press and journalists of other media, public seminars and other events like fairs and scientific cafés. This has resulted in an efficient outreach aiming at the general public:

- presenting highlights regarding the operation of the brain, and the many diseases of the brain. This is important since it is often not realized that these diseases are responsible for no less than one third of the costs for health care in Europe, Japan and North America;
- explaining the needs for funding of research regarding the brain and the mechanisms underlying these different disease affecting both the mental health and that of neurological disabilities
- reinforcing the role of the Academy of Finland and its international outreach

Through these actions the Finnish newspapers have covered many aspects of the NEURO Programme, and so has the radio and television. The NEURO Programme has also created a series of television programmes with a private production company for the Finnish Broadcasting Company YLE. The Academy of Finland has furthermore taken part in the world-wide annual Brain awareness week together with the Brain Research Society of Finland.

The communication unit of the Academy of Finland has clearly done a very successful outreach activity. The Public has shown a lot of interest in the Programme.

Table 4. Communication with media and the general public.

Type of communication	Number of times
Articles in general journals, newspapers and magazines	58
Articles in electric media	7
Radio	9
TV appearances	7

8 CONCLUSIONS AND RECOMMENDATIONS

Summary of conclusions

The objectives of the NEURO Programme were very ambitious and challenging, maybe even somewhat unrealistic in respect to the low level of funding and short duration of the Programme. However, as the funded projects have been quite successful, many of the objectives of the Program have been achieved:

- more effective networking and collaboration between researchers in Canada, China and Finland has been established,
- researcher mobility between the countries has been stimulated,
- the Programme has provided positions for doctoral and postdoctoral level researchers and supported career development of junior scientists,
- new forms of research collaboration have been established, and
- the exchange of new scientific knowledge among scientists and especially between scientists and other interest groups (e.g. media and the general public) has been accelerated.

It is more difficult to determine the exact role of the NEURO Programme funding in promotion of high-quality multi- and interdisciplinary research in neuroscience in the participating countries, and in enhancing the application of advanced technologies in neuroscience. In many cases the participating research groups achieved these goals, but it is not clear how much of the success can be ascribed to the NEURO Programme and how much to other more substantial funding streams.

Recommendations

Programme Manager Mika Tirronen is well perceived by his Academy colleagues as a driving force for the NEURO Programme. His initiative and diplomacy in fostering new international collaborations were particularly appreciated. This effort is to be encouraged as other partners are needed in order to develop new collaborations, e.g. with Japan and the USA. A greater devotion of time on his part would have been beneficial for the Programme, especially since the role of the Steering Committee, while essential for planning the Programme, was quite limited at the operational level of the Programme. We recommend that the position of a Programme Coordinator approaches full-time especially when the research programme is broad-based and of multidisciplinary and international nature, such as the NEURO Programme.

The NEURO Programme was very wide in its scope which was useful for launching a comprehensible and highly successful programme in neuroscience. In the current Programme two strong themes emerged, systems and cognitive neurobiology (especially imaging) and molecular neurobiology. Since integration of these two areas is very important and relevant but currently poorly represented in Finland, the bridge between them should be strengthened in the future. It is **recommended** that an extended programme with a narrower focus on the integration of cognitive and

molecular neurobiology is launched allocating more resources to the most successful projects.

Whereas in current neuroscience Programme the links of basic research to potential drug development and diagnostics is apparent, less emphasis has been devoted to technological developments in terms of information processing and robotics. We **recommend** that such intellectual transfer and commercial development be elaborated as part of the research strategies particularly for an extended programme.

While the first Programme was highly successful it is widely concluded that the duration of the Programme was too short particularly for establishing new interdisciplinary and international interactions of projects. We **recommend** extending the duration of the multidisciplinary research programme in general and specifically the NEURO Programme by making it possible to fund successful projects for a second period after a mid-term evaluation. Extended projects would also permit practical applications to fruition.

One of the strengths of the Programme for the trainees has been the international collaborations. Visits to other laboratories are highly recommended as part of their training. We therefore **recommend** that the Academy set aside a small amount of funding for international mobility within the projects funded. Such decisions to support mobility could be made by the Programme Coordinator and the Steering Committee when need arises.

The Programme was well launched and the panel recommends an extension for successful projects. However, funding has come to an end for many projects, although no exit strategy has been elaborated for such projects. The panel perceived this as a shortcoming. We **recommend** that the applicants develop an exit strategy at the time of application, thus encouraging collaborators to develop a longer term plan.

It is **recommended** that the final reports are requested from each collaborative project. The collaborative efforts should be very clearly explained in such reports.



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