



HELSINGIN YLIOPISTO
HELSINGFORS UNIVERSITET
UNIVERSITY OF HELSINKI

INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL
TRAINING AT THE UNIVERSITY OF HELSINKI 2005–2010

RC-Specific Evaluation of Neuron – Neuroscience Center

Seppo Saari & Antti Moilanen (Eds.)



Evaluation Panel: Medicine, Biomedicine and Health Sciences

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Title: International Evaluation of Research and Doctoral Training at the University of Helsinki 2005–2010 : RC-Specific Evaluation of Neuron – Neuroscience Center	
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Summary: <p>Researcher Community (RC) was a new concept of the participating unit in the evaluation. Participation in the evaluation was voluntary and the RCs had to choose one of the five characteristic categories to participate.</p> <p>Evaluation of the Researcher Community was based on the answers to the evaluation questions. In addition a list of publications and other activities were provided by the TUHAT system. The CWTS/Leiden University conducted analyses for 80 RCs and the Helsinki University Library for 66 RCs.</p> <p>Panellists, 49 and two special experts in five panels evaluated all the evaluation material as a whole and discussed the feedback for RC-specific reports in the panel meetings in Helsinki. The main part of this report is consisted of the feedback which is published as such in the report.</p> <p>Chapters in the report:</p> <ol style="list-style-type: none"> 1. Background for the evaluation 2. Evaluation feedback for the Researcher Community 3. List of publications 4. List of activities 5. Bibliometric analyses <p>The level of the RCs' success can be concluded from the written feedback together with the numeric evaluation of four evaluation questions and the category fitness. More conclusions of the success can be drawn based on the University-level report.</p>	
RC-specific information:	
Main scientific field of research: Medicine, Biomedicine and Health Sciences	RC-specific keywords: basic neuroscience research; brain diseases; societal impact; graduate schools
Participation category: 1. Research of the participating community represents the international cutting edge in its field	
RC's responsible person: Rauvala, Heikki	
Keywords: Research Evaluation, Meta-evaluation, Doctoral Training, Bibliometric Analyses, Researcher Community	
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Foreword

The evaluation of research and doctoral training is being carried out in the years 2010–2012 and will end in 2012. The steering group appointed by the Rector in January 2010 set the conditions for participating in the evaluation and prepared the Terms of Reference to present the evaluation procedure and criteria. The publications and other scientific activities included in the evaluation covered the years 2005–2010.

The participating unit in the evaluation was defined as a Researcher Community (RC). To obtain a critical mass with university-level impact, the number of members was set to range from 20 to 120. The RCs were required to contain researchers in all stages of their research career, from doctoral students to principal investigators (PIs). All in all, 136 Researcher Communities participated in this voluntary evaluation, 5857 persons in total, of whom 1131 were principal investigators. PIs were allowed to participate in two communities in certain cases, and 72 of them used this opportunity and participated in two RCs.

This evaluation enabled researchers to define RCs from the “bottom up” and across disciplines. The aim of the evaluation was not to assess individual performance but a community with shared aims and researcher-training activities. The RCs were able to choose among five different categories that characterised the status and main aims of their research. The steering group considered the process of applying to participate in the evaluation to be important, which led to the establishment of these categories. In addition, providing a service for the RCs to enable them to benchmark their research at the global level was a main goal of the evaluation.

The data for the evaluation consisted of the RCs’ answers to evaluation questions on supplied e-forms and a compilation extracted from the TUHAT – Research Information System (RIS) on 12 April 2011. The compilation covered scientific and other publications as well as certain areas of scientific activities. During the process, the RCs were asked to check the list of publications and other scientific activities and make corrections if needed. These TUHAT compilations are public and available on the evaluation project sites of each RC in the TUHAT-RIS.

In addition to the e-form and TUHAT compilation, University of Leiden (CWTS) carried out bibliometric analyses from the articles included in the Web of Science (WoS). This was done on University and RC levels. In cases where the publication forums of the RC were clearly not represented by the WoS data, the Library of the University of Helsinki conducted a separate analysis of the publications. This was done for 66 RCs representing the humanities and social sciences.

The evaluation office also carried out an enquiry targeted to the supervisors and PhD candidates about the organisation of doctoral studies at the University of Helsinki. This and other documents describing the University and the Finnish higher education system were provided to the panellists.

The panel feedback for each RC is unique and presented as an entity. The first collective evaluation reports available for the whole panel were prepared in July–August 2011. The reports were accessible to all panel members via the electronic evaluation platform in August. Scoring from 1 to 5 was used to complement written feedback in association with evaluation questions 1–4 (scientific focus and quality, doctoral training, societal impact, cooperation) and in addition to the category evaluating the fitness for participation in the evaluation. Panellists used the international level as a point of comparison in the evaluation. Scoring was not expected to go along with a preset deviation.

Each of the draft reports were discussed and dealt with by the panel in meetings in Helsinki (from 11 September to 13 September or from 18 September to 20 September 2011). In these meetings the panels also examined the deviations among the scores and finalised the draft reports together.

The current RC-specific report deals shortly with the background of the evaluation and the terms of participation. The main evaluation feedback is provided in the evaluation report, organised according to the evaluation questions. The original material provided by the RCs for the panellists has been attached to these documents.

On behalf of the evaluation steering group and office, I sincerely wish to thank you warmly for your participation in this evaluation. The effort you made in submitting the data to TUHAT-RIS is gratefully acknowledged by the University. We wish that you find this panel feedback useful in many ways. The bibliometric profiles may open a new view on your publication forums and provide a perspective for discussion on your choice of forums. We especially hope that this evaluation report will help you in setting the future goals of your research.

Johanna Björkroth
Vice-Rector
Chair of the Steering Group of the Evaluation

Steering Group of the evaluation

Steering group, nominated by the Rector of the University, was responsible for the planning of the evaluation and its implementation having altogether 22 meetings between February 2010 and March 2012.

Chair

Vice-Rector, professor **Johanna Björkroth**

Vice-Chair

Professor **Marja Airaksinen**

Chief Information Specialist, Dr **Maria Forsman**

Professor **Arto Mustajoki**

University Lecturer, Dr **Kirsi Pyhälä**

Director of Strategic Planning and Development, Dr **Ossi Tuomi**

Doctoral candidate, MSocSc **Jussi Vauhkonen**

Panel members

CHAIR

Professor Lorenz Poellinger

Cancer biology, cell and molecular biology
Karolinska Institute, Sweden

VICE-CHAIR

Professor Cornelia van Duijn

Genetic epidemiology, Alzheimer's disease and related disorders
Erasmus Medical Centre, the Netherlands

Professor Johanna Ivaska

Molecular cell biology, cell adhesion, cancer biology
University of Turku, VTT Technical Research Centre, Finland

Professor Olli Lassila

Immunology, medical microbiology
University of Turku, Finland

Professor Hans-Christian Pape

Neuroscience, neurophysiology
University of Münster, Germany

Professor Thomas Ruzicka

Dermatology, allergology
Ludwig-Maximilians-Universität (LMU) München, Germany

Professor Lars Terenius

Experimental alcohol and drug dependence research, mental disorders,
preventive medicine
Karolinska Institute, Sweden

Professor Peter York

Physical pharmaceuticals, pharmaceutical chemistry, pharmaceutical
technology
University of Bradford, Great Britain

The panel, independently, evaluated all the submitted material and was responsible for the feedback of the RC-specific reports. The panel members were asked to confirm whether they had any conflict of interests with the RCs. If this was the case, the panel members disqualified themselves in discussion and report writing.

Added expertise to the evaluation was contributed by two evaluators outside the panels and by three members from the other panels.

External Experts

Professor Olli Carpén

Pathology, cancer cell metastasis
University of Turku
Finland

Professor Anders Linde

Oral biochemi
Faculty of Odontology
Göteborg University
Sweden

Experts from the Other Panels

Professor Jan-Otto Carlsson, from the Panel of Natural Sciences

Professor Danny Huylebroek, from the Panel of Biological, Agricultural and Veterinary Sciences

Professor Holger Stark, from the Panel of Natural Sciences

EVALUATION OFFICE

Dr Seppo Saari, Doc., Senior Adviser in Evaluation, was responsible for the entire evaluation, its planning and implementation and acted as an Editor-in-chief of the reports.

Dr Eeva Sievi, Doc., Adviser, was responsible for the registration and evaluation material compilations for the panellists. She worked in the evaluation office from August 2010 to July 2011.

MSocSc Paula Ranne, Planning Officer, was responsible for organising the panel meetings and all the other practical issues like agreements and fees and editing a part the RC-specific reports. She worked in the evaluation office from March 2011 to January 2012.

Mr Antti Moilanen, Project Secretary, was responsible for editing the reports. He worked in the evaluation office from January 2012 to April 2012.

TUHAT OFFICE

Provision of the publication and other scientific activity data

Mrs Aija Kaitera, Project Manager of TUHAT-RIS served the project ex officio providing the evaluation project with the updated information from TUHAT-RIS. The TUHAT office assisted in mapping the publications with CWTS/University of Leiden.

MA Liisa Ekebom, Assisting Officer, served in TUHAT-RIS updating the publications for the evaluation. She also assisted the UH/Library analyses.

BA Liisa Jäppinen, Assisting Officer, served in TUHAT-RIS updating the publications for the evaluation.

HELSINKI UNIVERSITY LIBRARY

Provision of the publication analyses

Dr Maria Forsman, Chief Information Specialist in the Helsinki University Library, managed with her 10 colleagues the bibliometric analyses in humanities, social sciences and in other fields of sciences where CWTS analyses were not applicable.

Acronyms and abbreviations applied in the report

External competitive funding

AF – Academy of Finland
TEKES - Finnish Funding Agency for Technology and Innovation
EU - European Union
ERC - European Research Council
International and national foundations
FP7/6 etc. /Framework Programmes/Funding of European Commission

Evaluation marks

Outstanding (5)
Excellent (4)
Very Good (3)
Good (2)
Sufficient (1)

Abbreviations of Bibliometric Indicators

P - Number of publications
TCS – Total number of citations
MCS - Number of citations per publication, excluding self-citations
PNC - Percentage of uncited publications
MNCS - Field-normalized number of citations per publication
MNJS - Field-normalized average journal impact
THCP10 - Field-normalized proportion highly cited publications (top 10%)
INT_COV - Internal coverage, the average amount of references covered by the WoS
WoS – Thomson Reuters Web of Science Databases

Participation category

Category 1. The research of the participating community represents the international cutting edge in its field.
Category 2. The research of the participating community is of high quality, but the community in its present composition has yet to achieve strong international recognition or a clear break-through.
Category 3. The research of the participating community is distinct from mainstream research, and the special features of the research tradition in the field must be considered in the evaluation.
Category 4. The research of the participating community represents an innovative opening.
Category 5. The research of the participating community has a highly significant societal impact.

Research focus areas of the University of Helsinki

Focus area 1: The basic structure, materials and natural resources of the physical world
Focus area 2: The basic structure of life
Focus area 3: The changing environment – clean water
Focus area 4: The thinking and learning human being
Focus area 5: Welfare and safety
Focus area 6: Clinical research
Focus area 7: Precise reasoning
Focus area 8: Language and culture
Focus area 9: Social justice
Focus area 10: Globalisation and social change

1 Introduction to the Evaluation

1.1 RC-specific evaluation reports

The participants in the evaluation of research and doctoral training were Researcher Communities (hereafter referred to as the RC). The RC refers to the group of researchers who registered together in the evaluation of their research and doctoral training. Preconditions in forming RCs were stated in the Guidelines for the Participating Researcher Communities. The RCs defined themselves whether their compositions should be considered well-established or new.

It is essential to emphasise that the evaluation combines both meta-evaluation¹ and traditional research assessment exercise and its focus is both on the research outcomes and procedures associated with research and doctoral training. The approach to the evaluation is enhancement-led where self-evaluation constituted the main information. The answers to the evaluation questions formed together with the information of publications and other scientific activities an entity that was to be reviewed as a whole.

The present evaluation recognizes and justifies the diversity of research practices and publication traditions. Traditional Research Assessment Exercises do not necessarily value high quality research with low volumes or research distinct from mainstream research. It is challenging to expose the diversity of research to fair comparison. To understand the essence of different research practices and to do justice to their diversity was one of the main challenges of the present evaluation method. Understanding the divergent starting points of the RCs demanded sensitivity from the evaluators.

1.2 Aims and objectives in the evaluation

The aims of the evaluation are as follows:

- to improve the level of research and doctoral training at the University of Helsinki and to raise their international profile in accordance with the University's strategic policies. The improvement of doctoral training should be compared to the University's policy.²
- to enhance the research conducted at the University by taking into account the diversity, originality, multidisciplinary nature, success and field-specificity,
- to recognize the conditions and prerequisites under which excellent, original and high-impact research is carried out,
- to offer the academic community the opportunity to receive topical and versatile international peer feedback,
- to better recognize the University's research potential.
- to exploit the University's TUHAT research information system to enable transparency of publishing activities and in the production of reliable, comparable data.

1.3 Evaluation method

The evaluation can be considered as an enhancement-led evaluation. Instead of ranking, the main aim is to provide useful information for the enhancement of research and doctoral training of the participating RCs. The comparison should take into account each field of science and acknowledge their special character.

¹ The panellists did not read research reports or abstracts but instead, they evaluated answers to the evaluation questions, tables and compilations of publications, other scientific activities, bibliometrics or comparable analyses.

² [Policies on doctoral degrees and other postgraduate degrees at the University of Helsinki.](#)

The comparison produced information about the present status and factors that have lead to success. Also challenges in the operations and outcomes were recognized.

The evaluation approach has been designed to recognize better the significance and specific nature of researcher communities and research areas in the multidisciplinary top-level university. Furthermore, one of the aims of the evaluation is to bring to light those evaluation aspects that differ from the prevalent ones. Thus the views of various fields of research can be described and research arising from various starting points understood better. The doctoral training is integrated into the evaluation as a natural component related to research. Operational processes of doctoral training are being examined in the evaluation.

Five stages of the evaluation method were:

1. Registration – Stage 1
2. Self-evaluation – Stage 2
3. TUHAT³ compilations on publications and other scientific activities⁴
4. External evaluation
5. Public reporting

1.4 Implementation of the external evaluation

Five Evaluation Panels

Five evaluation panels consisted of independent, renowned and highly respected experts. The main domains of the panels are:

1. biological, agricultural and veterinary sciences
2. medicine, biomedicine and health sciences
3. natural sciences
4. humanities
5. social sciences

The University invited 10 renowned scientists to act as chairs or vice-chairs of the five panels based on the suggestions of faculties and independent institutes. Besides leading the work of the panel, an additional role of the chairs was to discuss with other panel chairs in order to adopt a broadly similar approach. The panel chairs and vice-chairs had a pre-meeting on 27 May 2011 in Amsterdam.

The panel compositions were nominated by the Rector of the University 27 April 2011. The participating RCs suggested the panel members. The total number of panel members was 50. The reason for a smaller number of panellists as compared to the previous evaluations was the character of the evaluation as a meta-evaluation. The panellists did not read research reports or abstracts but instead, they evaluated answers to the evaluation questions, tables and compilations of publications, other scientific activities, bibliometrics and comparable analyses.

The panel meetings were held in Helsinki:

- On 11–13 September 2011: (1) biological, agricultural and veterinary sciences, (2) medicine, biomedicine and health sciences and (3) natural sciences.
- On 18–20 September 2011: (4) humanities and (5) social sciences.

³ TUHAT (acronym) of Research Information System (RIS) of the University of Helsinki

⁴ Supervision of thesis, prizes and awards, editorial work and peer reviews, participation in committees, boards and networks and public appearances.

1.5 Evaluation material

The main material in the evaluation was the RCs' self-evaluations that were qualitative in character and allowed the RCs to choose what was important to mention or emphasise and what was left unmentioned.

The present evaluation is exceptional at least in the Finnish context because it is based on both the evaluation documentation (self-evaluation questions, publications and other scientific activities) and the bibliometric reports. All documents were delivered to the panellists for examination.

Traditional bibliometrics can be reasonably done mainly in medicine, biosciences and natural sciences when using the Web of Science database, for example. Bibliometrics, provided by CWTS/The Centre for Science and Technology Studies, University of Leiden, cover only the publications that include WoS identification in the TUHAT-RIS.

Traditional bibliometrics are seldom relevant in humanities and social sciences because the international comparable databases do not store every type of high quality research publications, such as books and monographs and scientific journals in other languages than English. The Helsinki University Library has done analysis to the RCs, if their publications were not well represented in the Web of Science databases (RCs should have at least 50 publications and internal coverage of publications more than 40%) – it meant 58 RCs. The bibliometric material for the evaluation panels was available in June 2011. The RC-specific bibliometric reports are attached at the end of each report.

The panels were provided with the evaluation material and all other necessary background information, such as the basic information about the University of Helsinki and the Finnish higher education system.

Evaluation material

1. Registration documents of the RCs for the background information
2. Self evaluation material – answers to the evaluation questions
3. Publications and other scientific activities based on the TUHAT RIS:
 - 3.1. statistics of publications
 - 3.2. list of publications
 - 3.3. statistics of other scientific activities
 - 3.4. list of other scientific activities
4. Bibliometrics and comparable analyses:
 - 4.1. Analyses of publications based on the verification of TUHAT-RIS publications with the Web of Science publications (CWTS/University of Leiden)
 - 4.2. Publication statistics analysed by the Helsinki University Library - mainly for humanities and social sciences
5. University level survey on doctoral training (August 2011)
6. University level analysis on publications 2005–2010 (August 2011) provided by CWTS/University of Leiden

Background material

University of Helsinki

- [Basic information about the University of the Helsinki](#)
- [The structure of doctoral training at the University of Helsinki](#)
- Previous evaluations of research at the University of Helsinki – links to the reports: [1998](#) and [2005](#)

The Finnish Universities/Research Institutes

- [Finnish University system](#)
- [Evaluation of the Finnish National Innovation System](#)
- [The State and Quality of Scientific Research in Finland. Publication of the Academy of Finland 9/09.](#)

The evaluation panels were provided also with other relevant material on request before the meetings in Helsinki.

1.6 Evaluation questions and material

The participating RCs answered the following evaluation questions which are presented according to the evaluation form. In addition, TUHAT RIS was used to provide the **additional material** as explained. For giving the feedback to the RCs, the panellists received the evaluation feedback form constructed in line with the evaluation questions:

1. Focus and quality of the RC's research

- Description of
 - the RC's research focus.
 - the quality of the RC's research (incl. key research questions and results)
 - the scientific significance of the RC's research in the research field(s)
- Identification of the ways to strengthen the focus and improve the quality of the RC's research

The additional material: TUHAT compilation of the RC's publications, analysis of the RC's publications data (provided by University of Leiden and the Helsinki University Library)

A written feedback from the aspects of: scientific quality, scientific significance, societal impact, innovativeness

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

2. Practises and quality of doctoral training

- Organising of the doctoral training in the RC. Description of the RC's principles for:
 - recruitment and selection of doctoral candidates
 - supervision of doctoral candidates
 - collaboration with faculties, departments/institutes, and potential graduate schools/doctoral programmes
 - good practises and quality assurance in doctoral training
 - assuring of good career perspectives for the doctoral candidates/fresh doctorates
- Identification of the RC's strengths and challenges related to the practises and quality of doctoral training, and the actions planned for their development.

The additional material: TUHAT compilation of the RC's other scientific activities/supervision of doctoral dissertations

A written feedback from the aspects of: processes and good practices related to leadership and management

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

3. The societal impact of research and doctoral training

- Description on how the RC interacts with and contributes to the society (collaboration with public, private and/or 3rd sector).
- Identification of the ways to strengthen the societal impact of the RC's research and doctoral training.

The additional material: TUHAT compilation of the RC's other scientific activities.

A written feedback from the aspects of: societal impact, national and international collaboration, innovativeness

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

4. International and national (incl. intersectoral) research collaboration and researcher mobility

- Description of
 - the RC's research collaborations and joint doctoral training activities
 - how the RC has promoted researcher mobility
- Identification of the RC's strengths and challenges related to research collaboration and researcher mobility, and the actions planned for their development.

A written feedback from the aspects of: scientific quality, national and international collaboration

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

5. Operational conditions

- Description of the operational conditions in the RC's research environment (e.g. research infrastructure, balance between research and teaching duties).
- Identification of the RC's strengths and challenges related to operational conditions, and the actions planned for their development.

A written feedback from the aspects of: processes and good practices related to leadership and management

- Strengths
- Areas of development
- Other remarks
- Recommendations

6. Leadership and management in the researcher community

- Description of
 - the execution and processes of leadership in the RC
 - how the management-related responsibilities and roles are distributed in the RC
 - how the leadership- and management-related processes support
 - high quality research
 - collaboration between principal investigators and other researchers in the RC
 - the RC's research focus
 - strengthening of the RC's know-how
- Identification of the RC's strengths and challenges related to leadership and management, and the actions planned for developing the processes

7. External competitive funding of the RC

- The RCs were asked to provide information of such external competitive funding, where:
 - the funding decisions have been made during 1.1.2005-31.12.2010, and
 - the administrator of the funding is/has been the University of Helsinki
- On the e-form the RCs were asked to provide:
 - 1) The relevant funding source(s) from a given list (Academy of Finland/Research Council, TEKES/The Finnish Funding Agency for Technology and Innovation, EU, ERC, foundations, other national funding organisations, other international funding organisations), and
 - 2) The total sum of funding which the organisation in question had decided to allocate to the RCs members during 1.1.2005-31.12.2010.

Competitive funding reported in the text is also to be considered when evaluating this point.

A written feedback from the aspects of: scientific quality, scientific significance, societal impact, innovativeness, future significance

- Strengths
- Areas of development
- Other remarks
- Recommendations

8. The RC's strategic action plan for 2011-2013

- RC's description of their future perspectives in relation to research and doctoral training.

A written feedback from the aspects of: scientific quality, scientific significance, societal impact, processes and good practices related to leadership and management, national and international collaboration, innovativeness, future significance

- Strengths
- Areas of development

- Other remarks
- Recommendations

9. Evaluation of the category of the RC in the context of entity of the evaluation material (1-8)

The RC's fitness to the chosen participation category

A written feedback evaluating the RC's fitness to the chosen participation category

- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

10. Short description of how the RC members contributed the compilation of the stage 2 material

Comments on the compilation of evaluation material

11. How the UH's focus areas are presented in the RC's research?

Comments if applicable

12. RC-specific main recommendations based on the previous questions 1-11

13. RC-specific conclusions

1.7 Evaluation criteria

The panellists were expected to give evaluative and analytical feedback to each evaluation question according to their aspects in order to describe and justify the quality of the submitted material. In addition, the evaluation feedback was asked to be pointed out the level of the performance according to the following classifications:

- outstanding (5)
- excellent (4)
- very good (3)
- good (2)
- sufficient (1)

Evaluation according to the criteria was to be made with thorough consideration of the entire evaluation material of the RC in question. Finally, in questions 1-4 and 9, the panellists were expected to classify their written feedback into one of the provided levels (the levels included respective descriptions, 'criteria'). Some panels used decimals in marks. The descriptive level was interpreted according to the integers and not rounding up the decimals by the editors.

Description of criteria levels

Question 1 – FOCUS AND QUALITY OF THE RC'S RESEARCH

Classification: Criteria (level of procedures and results)

Outstanding quality of procedures and results (5)

Outstandingly strong research, also from international perspective. Attracts great international interest with a wide impact, including publications in leading journals and/or monographs published by leading international publishing houses. The research has world leading qualities. The research focus, key research questions scientific significance, societal impact and innovativeness are of outstanding quality.

In cases where the research is of a national character and, in the judgement of the evaluators, should remain so, the concepts of "international attention" or "international impact" etc. in the grading criteria above may be replaced by "international comparability".

Operations and procedures are of outstanding quality, transparent and shared in the community. The improvement of research and other efforts are documented and operations and practices are in alignment with the documentation. The ambition to develop the community together is of outstanding quality.

Excellent quality of procedures and results (4)

Research of excellent quality. Typically published with great impact, also internationally. Without doubt, the research has a leading position in its field in Finland.

Operations and procedures are of excellent quality, transparent and shared in the community. The improvement of research and other efforts are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of excellent quality.

Very good quality of procedures and results (3)

The research is of such very good quality that it attracts wide national and international attention.

Operations and procedures are of very good quality, transparent and shared in the community. The improvement of research and other efforts are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of very good quality.

Good quality of procedures and results (2)

Good research attracting mainly national attention but possessing international potential, extraordinarily high relevance may motivate good research.

Operations and procedures are of good quality, shared occasionally in the community. The improvement of research and other efforts are occasionally documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of good quality.

Sufficient quality of procedures and results (1)

In some cases the research is insufficient and reports do not gain wide circulation or do not have national or international attention. Research activities should be revised.

Operations and procedures are of sufficient quality, shared occasionally in the community. The improvement of research and other efforts are occasionally documented and operations and practices are to some extent in alignment with the documentation. The ambition to develop the community together is of sufficient quality.

Question 2 – DOCTORAL TRAINING

Question 3 – SOCIETAL IMPACT

Question 4 – COLLABORATION

Classification: Criteria (level of procedures and results)

Outstanding quality of procedures and results (5)

Procedures are of outstanding quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are documented and operations and practices are in alignment with the documentation. The ambition to develop the community together is of outstanding quality. The procedures and results are regularly evaluated and the feedback has an effect on the planning.

Excellent quality of procedures and results (4)

Procedures are of excellent quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of excellent quality. The procedures and outcomes are evaluated and the feedback has an effect on the planning.

Very good quality of procedures and results (3)

Procedures are of very good quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and

management are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of very good quality.

Good quality of procedures and results (2)

Procedures are of good quality, shared occasionally in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of good quality.

Sufficient quality of procedures and results (1)

Procedures are of sufficient quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are occasionally documented and operations and practices are to some extent in alignment with the documentation. The ambition to develop the community together is of sufficient quality.

Question 9 – CATEGORY

Participation category – fitness for the category chosen

The choice and justification for the chosen category below should be reflected in the RC's responses to the evaluation questions 1–8.

1. *The research of the participating community represents the international cutting edge in its field.*
2. *The research of the participating community is of high quality, but the community in its present composition has yet to achieve strong international recognition or a clear break-through.*
3. *The research of the participating community is distinct from mainstream research, and the special features of the research tradition in the field must be considered in the evaluation.* The research is of high quality and has great significance and impact in its field. However, the generally used research evaluation methods do not necessarily shed sufficient light on the merits of the research.
4. *The research of the participating community represents an innovative opening.* A new opening can be an innovative combination of research fields, or it can be proven to have a special social, national or international demand or other significance. Even if the researcher community in its present composition has yet to obtain proof of international success, its members can produce convincing evidence of the high level of their previous research.
5. *The research of the participating community has a highly significant societal impact.* The participating researcher community is able to justify the high social significance of its research. The research may relate to national legislation, media visibility or participation in social debate, or other activities promoting social development and human welfare. In addition to having societal impact, the research must be of a high standard.

An example of outstanding fitness for category choice (5) ⁵

The RC's representation and argumentation for the chosen category were convincing. The RC recognized its real capacity and apparent outcomes in a wider context to the research communities. The specific character of the RC was well-recognized and well stated in the responses. The RC fitted optimally for the category.

- Outstanding (5)
- Excellent (4)
- Very good (3)
- Good (2)
- Sufficient (1)

The above-mentioned definition of outstanding was only an example in order to assist the panellists in the positioning of the classification. There was no exact definition for the category fitness.

⁵ The panels discussed the category fitness and made the final conclusions of the interpretation of it.

1.8 Timetable of the evaluation

The main timetable of the evaluation:

- | | |
|--|-----------------------|
| 1. Registration | November 2010 |
| 2. Submission of self-evaluation materials | January–February 2011 |
| 3. External peer review | May–September 2011 |
| 4. Published reports | March–April 2012 |
| - University level public report | |
| - RC specific reports | |

The entire evaluation was implemented during the university's strategy period 2010–2012. The preliminary results were available for the planning of the following strategy period in late autumn 2011. The evaluation reports will be published in March/April 2012. More detailed time schedule is published in the University report.

1.9 Evaluation feedback – consensus of the entire panel

The panellists evaluated all the RC-specific material before the meetings in Helsinki and mailed the draft reports to the evaluation office. The latest interim versions were on-line available to all the panellists on the Wiki-sites. In September 2011, in Helsinki the panels discussed the material, revised the first draft reports and decided the final numeric evaluation. After the meetings in Helsinki, the panels continued working and finalised the reports before the end of November 2011. The final RC-specific reports are the consensus of the entire panel.

The evaluation reports were written by the panels independently. During the editing process, the evaluation office requested some clarifications from the panels when necessary. The tone and style in the reports were not harmonized in the editing process. All the reports follow the original texts written by the panels as far as it was possible.

The original evaluation material of the RCs, provided for the panellists is attached at the end of the report. It is essential to notice that the exported lists of publications and other scientific activities depend how the data was stored in the TUHAT-RIS by the RCs.

2 Evaluation feedback

2.1 Focus and quality of the RC's research

- *Description of*
 - *the RC's research focus*
 - *the quality of the RC's research (incl. key research questions and results)*
 - *the scientific significance of the RC's research in the research field(s)*
- *Identification of the ways to strengthen the focus and improve the quality of the RC's research*

ASPECTS: Scientific quality, scientific significance, societal impact, innovativeness

The RC Neuron is comprised of 12 research groups. Its strengths rely on an exceptional combination of organizational (see pt. 2.5), structural (pts. 2.2, 2.5), and scientific (pt. 2.1) elements. One important basis of Neuron is the Neuroscience Centre (NC), the founders of which have strategically assembled this centre and moved it to excellent international standing and scientific reputation.

The **overall mission** of Neuron is “to carry out top-level basic research on development and functions of healthy and diseases nervous systems”. In order to achieve this goal, Neuron has generated a concept of a truly interdisciplinary nature, which facilitates hypothesis-driven approaches to nervous system diseases. Central to this concept are the mechanisms of synaptic interactions and plasticity, around which the founders of Neuron have skilfully placed a number of dedicated approaches focusing on inhibitory neurotransmission and the role of chloride homeostasis (Kaila), pathogenesis of epilepsies (Lehesjoki, Kaila), synaptic maturation (Lauri, Taira), neurotrophic factors (Castrén, Airaksinen), structural plasticity (Hotulainen), adhesion and matrix molecules in neuronal development and immune regulation (Rauvala), histaminergic transmitters in development and disease (Panula), computational analyses of synaptic network activity (Palva). The approaches are convincingly complementary, both in scientific and technical terms.

The **top level** of Neuron shows in scientific quality that is outstanding by international standards, with respect to scientific output and input (see pt. 2.7). The science of Neuron is highly original and innovative. Scientific findings of Neuron have significantly contributed to setting the pace of the research field, and in parts have led to remarkable clinical translations. To mention just one of Neuron landmark findings, the group of Kaila has shown that respiratory alkalosis induced by hyperthermia can precipitate epileptic seizures, thereby introducing a novel pathophysiological principle to epileptogenesis and paving the way for novel therapeutic avenues. The overall output of Neuron is excellent, with an average of around 50 publications/year, no publications in uncritical journals, few (<5%) in fair journals, the majority (>70%) in competitive and good journals, and a significant number (20–25%) in top-rank journals of Neuroscience and in interdisciplinary journals. This distribution indicates the strategy of Neuron for high quality output, and unequivocally testifies the success in striving for science at top-quality.

The Neuron **overall concept** is successfully synergistic, as indicated by numerous common publications, the steady growth of research groups (7 in 2005 to 13 in 2010) and of competitive outside funding (see pt. 2.7). **It is highly recommended** that this strategy is strengthened.

Numeric evaluation: 5 (Outstanding)

2.2 Practises and quality of doctoral training

- *Organising of the doctoral training in the RC. Description of the RC's principles for:*
 - *recruitment and selection of doctoral candidates*
 - *supervision of doctoral candidates*
 - *collaboration with faculties, departments/institutes, and potential graduate schools/doctoral programmes*

- *good practises and quality assurance in doctoral training*
- *assuring of good career perspectives for the doctoral candidates/fresh doctorates*
- *Identification of the RC's strengths and challenges related to the practises and quality of doctoral training, and the actions planned for their development.*
- *Additional material: TUHAT compilation of the RC's other scientific activities/supervision of doctoral dissertations*

ASPECTS: Processes and good practices related to leadership and management

The organization of a **systematic neuroscience curriculum**, initiated by Kai Kaila, makes a most valuable contribution to Neuron (and the Helsinki science community). Courses are ECTS certified, at levels ranging from minor subject studies to a Master's Degree Program in Neuroscience. Doctoral students of Neuron can choose from three local doctoral programs (Finnish Grad School of Neuroscience; Helsinki Grad School of Biotech and Mol Biol, Helsinki Biomed Program). The tools for quality assurance include competitive open calls, ranking upon clear criteria, thesis committees, high quality teaching programs, and international exchange. Furthermore, Neuron researches have been actively setting up master's level training in neuroscience (MNEURO) and biotechnology (HEBIOT), and participate to international networks of doctoral programs (EU Marie curie, EMBO, NENS).

A total of 80 doctoral theses has been completed 2005–2010, which is a fair magnitude for an institution of the size of Neuron. The parallel lines of research and teaching represent a good example on how human resources/potential can be linked to scientific excellence, and there is no doubt that graduates will make their way in science. It would be interesting to obtain a more systematic follow-up survey of the graduates.

For optimally exploiting human resources, for attracting the most creative minds, and for generating graduates in an increasing competition, Neuron and Helsinki University may consider investing into a dedicated MD/PhD program. The close connection of basic to medical research in Neuron may provide a feasible basis for this.

Numeric evaluation: 5 (Outstanding)

2.3 The societal impact of research and doctoral training

- *Description on how the RC interacts with and contributes to the society (collaboration with public, private and/or 3rd sector).*
- *Identification of the ways to strengthen the societal impact of the RC's research and doctoral training.*
- *Additional material: TUHAT compilation of the RC's other scientific activities.*

ASPECTS: Societal impact, national and international collaboration, innovativeness

The **most significant societal impact** of Neuron resides in the strength of its research. Developmental disorders of the brain, neurodegenerative and psychiatric disorders impose a major burden to society and health care providers. Identification of underlying mechanisms by Neuron researchers thus is of highly significant societal impact. Further strengthening the impact is the increasing direct link of Neuron to medical science and to the development of novel treatment strategies (see pt. 2.1). The suggestion of Neuron to strengthen activities with pharmaceutical companies, making use for instance of the excellent Helsinki University campus infrastructure, and the participation of Neuron doctoral students in courses of biotechnology business skills, are thus appreciable activities, although not mandatory. Along the same line, the recent generation of Neuron spin-offs can be seen as convincing demonstration of Neuron's attempts to commercialize research output.

Providing insight of Neuron research to the **public** by a web-based computer game is a laudable first step, and Neuron might consider additional means to increase public recognition. Public days, pupils' labs, public lectures by prominent speakers, simple lab courses including basic and clinical parts, have been proven highly attractive to the public. In view of the limited resources of Neuron, the Helsinki University might provide support in logistic and financial terms.

Numeric evaluation: 4 (Excellent)

2.4 International and national (incl. intersectoral) research collaboration and researcher mobility

- *Description of*
 - *the RC's research collaborations and joint doctoral training activities*
 - *how the RC has promoted researcher mobility*
- *Identification of the RC's strengths and challenges related to research collaboration and researcher mobility, and the actions planned for their development.*

ASPECTS: *Scientific quality, national and international collaboration*

The excellent scientific reputation of Neuron is reflected by an exceptionally high proportion of staff members from foreign countries (40–50%), its contribution to several international research networks established after competitive evaluation (EU FP6 EPICURE, EU COST), memberships of numerous editorial boards of international scientific journals, and continued invitation for review articles in most prestigious international journals. The Neuroscience Graduate Program and Master's program are parts of the CORTEX training network (EU Marie Curie), and the Network of European Neuroscience Schools (NENS), respectively. The international profile of Neuron also shows in the number of international collaborations, which exceed the national ones in number.

A Scientific Advisory Board comprised of seven renowned international scientists, assures quality control to the highest international standards. Overall, the view of Neuron as being an **international research and teaching organization** is fully supported by the data.

Given the limited human resources of the Finnish academic system, Neuron should consider foreign recruitment on a more systematic basis. The Neuron suggestion to develop personal contacts to far-east Universities is laudable, although a more systematic approach might be helpful here. Seeking the contact of foreign offices of granting agencies, Neuroscience or Biomedical societies, or other Neuroscience Centres might be a promising way.

Numeric evaluation: 5 (Outstanding)

2.5 Operational conditions

- *Description of the operational conditions in the RC's research environment (e.g. research infrastructure, balance between research and teaching duties).*
- *Identification of the RC's strengths and challenges related to operational conditions, and the actions planned for their development.*

ASPECTS: *Processes and good practices related to leadership and management*

The RC Neuron is characterized by i) an administrative organization independent of faculties, avoiding some of the constraints inherent to traditional faculties, ii) an assortment of newly generated groups, complementing the molecular/cellular expertise of Neuron by developmental neurobiology, zebrafish neurobiology, and medical genetics, iii) core facilities with functional microscopic imaging, cell culture, and phenotyping labs for both mice and zebrafish, providing the basis for being competitive in some of the most important models of nervous system function iv) a Master's Program in Neuroscience and a Graduate School of Neuroscience, linking human resources and the scientific excellence of Neuron (see pt. 2.4), v) a well-balanced organization and management structure, complemented by an external scientific advisory board assuring the highest quality control.

These characteristics reflect an organizational, academic and structural profile that is truly outstanding in EU universities, and that may function as a prototype for integrating a highly effective research unit into a pre-existing university system. The founders of the Neuroscience Centre, Neuron and Helsinki University should be congratulated for their continued effort.

Practically, one consequence is that a PI can devote most of the working time to research, and despite exceptionally low teaching duties (5–10%), the overall quality of teaching is very high (see pt. 2.3).

The strategic decision to extend the neuroscientific research areas and the respective recruitment of research groups have made a significant contribution to the overall scientific standing, and have also generated the need to develop infrastructures. Neuron has adequately reacted to the increasing infrastructural demand by establishing respective core units. Inclusion of optogenetic technologies will further increase the demand for molecular genetics, micro engineering and electrophysiological in vivo units. This infrastructural development has obviously been pursued with no respective increase of the intramural budget. In fact, a large fraction (60%) of the operational costs is said to be covered by extramural funds. While this is laudable, it also creates an increasingly problematic situation, given the need for further infrastructural implementation. A new animal facility with increased overall capacity (as indicated in the RC report) is certainly an adequate step to improve the situation. The Helsinki University is asked to consider additional and adequate means along the same line to support infrastructural development.

The split location of Neuron at Viikki and Meilahti campuses seems to need some attention. While it seems to work well in practice, ways might be explored to even improve the conditions.

2.6 Leadership and management in the researcher community

- *Description of*
 - *the execution and processes of leadership in the RC*
 - *how the management-related responsibilities and roles are distributed in the RC*
 - *how the leadership- and management-related processes support*
 - *high quality research*
 - *collaboration between principal investigators and other researchers in the RC*
 - *the RC's research focus*
 - *strengthening of the RC's know-how*
- *Identification of the RC's strengths and challenges related to leadership and management, and the actions planned for developing the processes*

ASPECTS: Processes and good practices related to leadership and management

The organization of Neuron (the structures of academia, management and decision making, the quality assurance based on an external Scientific Advisory Board), convincingly fulfil the high quality standards of an independent research and teaching institute at a European university. Overall, the statement of the external Scientific Advisory Board that **“this model could serve as a European-wide example of how to optimize the use of resources within an existing university system”** is fully supported by available evidence.

Every effort should be taken to continue and strengthen the RC Neuron and the underlying Neuroscience Centre, which can be seen as a **landmark in the International Neuroscience Map**, and as a **highlight in the profile of the Helsinki University**.

2.7 External competitive funding of the RC

- *The RCs were asked to provide information of such external competitive funding, where:*
 - *the funding decisions have been made during 1.1.2005–31.12.2010, and*
 - *the administrator of the funding is/has been the University of Helsinki*
- *On the e-form the RCs were asked to provide:*
 - 1) *The relevant funding source(s) from a given list (Academy of Finland/Research Council, TEKES/The Finnish Funding Agency for Technology and Innovation, EU, ERC, foundations, other national funding organisations, other international funding organizations), and*
 - 2) *The total sum of funding which the organisation in question had decided to allocate to the RCs members during 1.1.2005–31.12.2010.*

Competitive funding reported in the text is also to be considered when evaluating this point.

ASPECTS: Scientific quality, scientific significance, societal impact, innovativeness and future significance

Extra-mural funding amounts to a total of appr. 15.5 Mill € (appr 2.6 Mill € p.a.). For such a young institution, with only recent recruitment of major groups and young group leaders, this is a very good record, even more so as funding is a result of competitive project evaluation.

2.8 The RC's strategic action plan for 2011–2013

• *RC's description of their future perspectives in relation to research and doctoral training.*

ASPECTS: Scientific quality, scientific significance, societal Impact, processes and good practices related to leadership and management, national and international collaboration, innovativeness, future significance

The innovative nature and the excellence of Neuron in scientific, academic, administrative and structural terms have been outlined in detail above (pts. 2.1, 2.3, 2.5, 2.6). There is no need for major strategic changes or developments: the single most important actions will be the continuation of the Neuroscience Centre, and further development of the infrastructure.

Neuron should be encouraged to exploit its perspectives along the experimental and clinical lines. Given the pre-existing excellence, and continued and extended support of the Helsinki University, the continued success of Neuron in scientific and academic terms is foreseeable.

2.9 Evaluation of the category of the RC in the context of entity of the evaluation material (1-8)

The RC's fitness to the chosen participation category.

Category 1. The research of the participating community represents the international cutting edge in its field.

There is no doubt that research of the Neuron community reflects the international status and peer-recognition. Neuron has made an outstanding contribution to the field of neuroscience and overall represents the international cutting edge in this field.

Numeric evaluation: 5 (Outstanding)

2.10 Short description of how the RC members contributed the compilation of the stage 2 material

The processes employed were fair and appropriate.

2.11 How the UH's focus areas are presented in the RC's research

Focus area 2: The basic structure of life

For details, see pt. 2.6 above. Overall, the program of Neuron is central to the UH's focus on "Basic Structure of Life", creates a significant part of the biomedical profile of UH, and, more specifically, has led to international visibility of UH in the field of neuroscience.

2.12 RC-specific main recommendations

There is no need for major strategic changes or developments: Neuron should be encouraged to pursue its excellent scientific and strategic concepts, and to further exploit its perspectives along the experimental and clinical lines.

The Helsinki University is asked to provide best possible support in order for this truly excellent RC to function.

2.13 RC-specific conclusions

The RC Neuron, based on the Neuroscience Centre, is characterized by i) a top level of scientific quality that is outstanding by international standards, with respect to both scientific output and input, ii) a research focus on synaptic interactions and plasticity, bearing high societal impact, iii) a carefully selected assortment of research groups, which were strategically selected to complement the molecular/cellular expertise by developmental neurobiology, zebrafish neurobiology, and medical genetics, iv) core facilities with functional microscopic imaging, cell culture, and phenotyping labs for both mice and zebrafish, providing the basis for being competitive in some of the most important models of nervous system function, v) a Master's and Graduate Program in Neuroscience, supporting recruitment of best young researchers at an international scale and thereby linking human resources to the scientific excellence of Neuron, vi) a well-balanced organization and management structure, complemented by an external scientific advisory board, assuring the highest quality control, and vii) an administrative organization independent of faculties, avoiding some of the constraints inherent to traditional faculties.

Together, this scientific and organizational concept may function as a prototype in the EU for integrating a highly effective research unit into a pre-existing university system. In fact, this concept has helped to form a research environment that is truly outstanding by international standards, with high peer recognition, which has made a significant contribution for making the Helsinki University visible as a top spot on the international neuroscience map.

2.14 Preliminary findings in the Panel-specific feedback

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2.15 Preliminary findings in the University-level evaluation

Research Focus

The RC Neuron is comprised of 12 research groups. Its strengths rely on an exceptional combination of organizational, structural, and scientific elements. These elements have been strategically assembled by the founders of Neuron, and their skilful exploitation and extension have developed Neuron into a neuroscience institution of excellent international standing and scientific reputation. A mere logical consequence is the certification of Neuron as a Finnish Centre of Excellence (Molecular Neurobiology until 2006; Molecular and Integrative Neurobiology 2008–2011).

The overall mission of Neuron is “to carry out top-level basic research on development and functions of healthy and diseases nervous systems”. In order to achieve this goal, Neuron has generated a concept of a truly interdisciplinary nature, which facilitates hypothesis-driven approaches to diseases of the nervous system. Central to this concept are the mechanisms of synaptic interactions and plasticity, around which the founders of Neuron have skilfully placed a number of dedicated approaches focusing on inhibitory neurotransmission and the role of chloride homeostasis (Kaila), pathogenesis of epilepsies (Lehesjoki, Kaila), synaptic maturation (Lauri, Taira), neurotrophic factors (Castrén, Airaksinen), structural plasticity (Hotulainen), adhesion and matrix molecules in neuronal development and immune regulation (Rauvala),

histaminergic transmitters in development and disease (Panula), computational analyses of synaptic network activity (Palva). The approaches are convincingly complementary, both in scientific and technical terms.

The top level of Neuron shows in scientific quality that is outstanding by international standards, with respect to scientific output and input. The science of Neuron is highly original and innovative. Scientific findings of Neuron have significantly contributed to setting the pace of the research field, and in parts have led to remarkable clinical translations. To mention just one of Neuron landmark findings, the group of Kaila has shown that respiratory alkalosis induced by hyperthermia can precipitate epileptic seizures, thereby introducing a novel pathophysiological principle to epileptogenesis and paving the way for novel therapeutic avenues. The overall output of Neuron is excellent, with an average of around 50 publications/year, no publications in uncritical journals, few (<5%) in fair journals, the majority (>70%) in competitive and good journals, and a significant number (20–25%) in top-rank journals of Neuroscience and in interdisciplinary journals. This distribution indicates the strategy of Neuron for high quality output, and unequivocally testifies of the success in striving for science at top-quality.

The overall concept of Neuron is successfully synergistic, as indicated by numerous common publications, the steady growth of research groups (7 in 2005 to 13 in 2010) and of competitive outside funding. The strategic concept of Neuron has been extended towards *in vivo*/behaviourally oriented neuroscience and clinically oriented neuroscience, which is remarkable for two major reasons. First, the recruitment of the respective new groups and the establishment of the required technical infrastructure seem to have been pursued with no significant increase of the intramural budget. Second, the strategy is a wise one, as it bears the promise of strengthening mutual bounds between Neuron and the Helsinki biomedical and medical community in general, and of increasing public awareness of Neuron as a top rank neuroscience centre. It is highly recommended that this strategy is strengthened.

Practices and Quality of Doctoral Training

The organization of a systematic curriculum in neuroscience, initiated by Kai Kaila, makes a most valuable contribution to Neuron (and the Helsinki research community). Courses are ECTS certified, at levels ranging from minor subject studies to a Master's Degree Program in Neuroscience. Doctoral students of Neuron can choose from three local doctoral programs (Finnish Grad School of Neuroscience; Helsinki Grad School of biotech and Mol Biol, Helsinki Biomed Program). The tools for quality assurance include competitive open calls, ranking upon clear criteria, thesis committees, high quality teaching programs, and international exchange. Furthermore, Neuron researches have been actively setting up master's level training in neuroscience (MNEURO) and biotechnology (HEBIOT), and participate in international networks of doctoral programs (EU Marie Curie, EMBO, NENS).

A total of 80 doctoral theses has been completed 2005–2010, which is a very fair output for an institution of the size of Neuron. The parallel lines of research and teaching represent a good example on how human resources/potential can be linked to scientific excellence, and there is no doubt that graduates will make their way in science. It would be interesting to obtain a more systematic follow-up survey of the graduates.

For optimally exploiting human resources, for attracting the most creative minds, and for generating graduates in an increasing competition, Neuron and Helsinki University may consider investing into a dedicated MD/PhD program. The close connection of basic to medical research in Neuron may provide a feasible basis for this.

Societal Impact

The most significant societal impact of Neuron resides in the strength of its research. Developmental disorders of the brain, neurodegenerative and psychiatric disorders impose a major burden to society and health care providers. Identification of underlying mechanisms by Neuron researchers thus is of highly significant societal impact. Further strengthening the impact is the increasing direct link of Neuron to medical science and to the development of novel treatment strategies. The suggestion of Neuron to strengthen activities with pharmaceutical companies, making use, for instance, of the excellent Helsinki University campus infrastructure, and the participation of Neuron doctoral students in courses of biotechnology business skills, are thus appreciable activities, although not mandatory. Along the same

line, the recent generation of Neuron spin-offs can be seen as convincing demonstration of Neuron's attempts to commercialize the research output.

Providing insight of Neuron research to the public by a web-based computer game is a laudable first step, and Neuron might consider additional means to increase public recognition. Public days, pupils' labs, public lectures by prominent speakers, simple lab courses including basic and clinical parts, have been proven highly attractive to the public. In view of the limited resources of Neuron, the Helsinki University and/or the City of Helsinki might provide support in logistic and financial terms.

International and National Collaboration

The excellent scientific reputation of Neuron is reflected by an exceptionally high proportion of staff members from foreign countries (40–50%), its contribution to several international research networks established after competitive evaluation (EU FP6 EPICURE, EU COST), memberships of numerous editorial boards of international scientific journals, and continued invitation for review articles in most prestigious international journals. The Neuroscience Graduate Program and Master's program are parts of the CORTEX training network (EU Marie Curie), and the Network of European Neuroscience Schools (NENS), respectively. The international profile of Neuron also shows in the number of international collaborations, which exceed the national ones in number.

The Scientific Advisory Board comprised of seven renowned international scientists, assures quality control to the highest international standards. Overall, the view of Neuron as being an international research and teaching organization is fully supported by the data.

Given the limited human resources of the Finnish academic system, Neuron should consider foreign recruitment on a more systematic basis. The suggestion of Neuron to develop personal contacts to far-east universities is laudable, although a more systematic approach might be helpful here. Seeking the contact of foreign offices of granting agencies, Neuroscience or Biomedical societies, or other Neuroscience Centres might be a promising way.

Leadership and Management

The organization of Neuron (the structures of academia, management and decision making, quality assurance based on an external scientific advisory board) convincingly fulfil the high quality standards of an independent research and teaching institute at a European university. Overall, the statement of the external Scientific Advisory Board that "this model could serve as a European-wide example of how to optimize the use of resources within an existing university system" is fully supported by available evidence.

From the point of view of external reviewers it is difficult to understand that no decision has been reached yet if and how to continue Neuron into the third 5-year term (starting 2011?). Every effort should be taken to continue and strengthen the NC, which has been grown to a landmark in the International Neuroscience Map, and clearly is a highlight in the profile of the Helsinki University.

External Funding

Extra-mural funding amounts to a total of appr. 15.5 Mill € (appr 2.6 Mill € p.a.). For such a young institution, with only recent recruitments of major groups and young group leaders, this is a very good track record, even more so as funding is a result of competitive project evaluation.

Strategic Action Plan

The innovative nature and the excellence of Neuron in scientific, academic, administrative and structural terms have been outlined in detail above. There is no need for major strategic changes or developments: the single most important actions will be continuation of the NC.

Neuron should be encouraged to exploit its perspectives along the experimental and clinical lines. Given the pre-existing excellence, and continued and extended support by the Helsinki University, the continued success of Neuron in scientific and academic terms is foreseeable.

Conclusions and Recommendations

The RC Neuron is characterized by i) a top level of scientific quality that is outstanding by international standards, with respect to both scientific output and input; ii) a research focus on synaptic interactions and plasticity bearing high societal impact; iii) a carefully selected assortment of research groups, which were strategically selected to complement the molecular/cellular expertise in developmental neurobiology, zebrafish neurobiology, and medical genetics; iv) core facilities with functional microscopic imaging, cell culture, and phenotyping labs for both mice and zebrafish, providing the basis for being competitive in some of the most important models of the function of the nervous system; v) a Master's and Graduate Program in Neuroscience, linking human resources to the scientific excellence of Neuron; vi) a well-balanced organization and management structure, complemented by an external scientific advisory board, assuring the highest quality control; and vii) an administrative organization independent of faculties, avoiding some of the constraints inherent to traditional faculties.

Together, this scientific and organizational concept may function as a prototype in the EU for integrating a highly effective research unit into a pre-existing university system. In fact, this concept has formed a research environment that is truly outstanding by international standards, with high peer recognition, and has made a significant contribution for making Helsinki University visible as a top spot on the international neuroscience map.

3 Appendices

- A. Original evaluation material
 - a. Registration material – Stage 1
 - b. Answers to evaluation questions – Stage 2
 - c. List of publications
 - d. List of other scientific activities
- B. Bibliometric analyses
 - a. Analysis provided by CWTS/University of Leiden
 - b. Analysis provided by Helsinki University Library (66 RCs)



International evaluation of research and doctoral training
at the University of Helsinki 2005-2010

RC-SPECIFIC MATERIAL FOR THE PEER REVIEW

NAME OF THE RESEARCHER COMMUNITY:
Neuroscience Center (Neuron)

LEADER OF THE RESEARCHER COMMUNITY:
Professor Heikki Rauvala, Neuroscience Center

RC-SPECIFIC MATERIAL FOR THE PEER REVIEW:

- Material submitted by the RC at stages 1 and 2 of the evaluation
 - STAGE 1 material: RC's registration form (incl. list of RC participants in an excel table)
 - STAGE 2 material: RC's answers to evaluation questions
- TUHAT compilations of the RC members' publications 1.1.2005-31.12.2010
- TUHAT compilations of the RC members' other scientific activities 1.1.2005-31.12.2010
- Web of Science(WoS)-based bibliometrics of the RC's publications data 1.1.2005-31.12.2010 (analysis carried out by CWTS, Leiden University)

NB! Since Web of Science(WoS)-based bibliometrics does not provide representative results for most RCs representing humanities, social sciences and computer sciences, the publications of these RCs will be analyzed by the UH Library (results available by the end of June, 2011)



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 1 MATERIAL (registration form)

1 RESPONSIBLE PERSON

Name: Rauvala, Heikki

E-mail:

Phone: +358919157621

Affiliation: Neuroscience Center

Street address: Viikinkaari 4

2 DESCRIPTION OF THE PARTICIPATING RESEARCHER COMMUNITY (RC)

Name of the participating RC (max. 30 characters): Neuroscience Center (NC)

Acronym for the participating RC (max. 10 characters): Neuron

Description of the operational basis in 2005-2010 (eg. research collaboration, joint doctoral training activities) on which the RC was formed (MAX. 2200 characters with spaces): Research groups of the NC are selected based on the evaluation by the SAB (scientific advisory board) of the Center. In addition to the scientific quality of the applicants, complementarity of their expertises is taken into account in the evaluation and final selection of the groups to form a team of collaborating groups. As can be seen from the annual reports from the years 2005-2009 reporting the yearly publication lists of the NC, this policy has resulted in numerous collaborative publications of the groups.

The evaluation has been discussed in the PI meeting of the NC. All PIs of the Center have expressed their wish to form an RC consisting of the NC groups.

3 SCIENTIFIC FIELDS OF THE RC

Main scientific field of the RC's research: medicine, biomedicine and health sciences

RC's scientific subfield 1: Neurosciences

RC's scientific subfield 2: --Select--

RC's scientific subfield 3: --Select--

RC's scientific subfield 4: --Select--

Other, if not in the list:

4 RC'S PARTICIPATION CATEGORY

Participation category: 1. Research of the participating community represents the international cutting edge in its field



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RC-SPECIFIC STAGE 1 MATERIAL (registration form)

Justification for the selected participation category (MAX. 2200 characters with spaces): The mission of the RC is to carry out top-level basic research on development and functions of the nervous system and on basic mechanisms of nervous system diseases. This is expected to lead to high publication activity in top-tier scientific journals and in high numbers of citations, which can be documented for example in the ISI database. It is therefore appropriate that the RC should be evaluated in the category 1, where the international cutting edge research is evaluated.

5 DESCRIPTION OF THE RC'S RESEARCH AND DOCTORAL TRAINING

Public description of the RC's research and doctoral training (MAX. 2200 characters with spaces): The Neuroscience Center was established as an independent research and teaching institute at the University of Helsinki in 2003. The mission is to carry out top-level basic research on development and functions of healthy and diseased nervous systems with the aim of being among the leading neuroscience institutes in Europe.

Both research and teaching within the NC focus on four, partially overlapping areas (molecular and cellular neuroscience, developmental neuroscience, cognitive and systems neuroscience, and basic research of the nervous system diseases), the combination of which is necessary to understand the complicated processes within the nervous system. The NC currently houses 13 research groups led by independent principal investigators. It bridges neuroscience research activities between the biosciences campus in Viikki and the medical campus in Meilahti with two of the groups working in Biomedicum Helsinki. The NC has responsibility for three core facilities providing sophisticated technologies for groups within and outside the NC: the neuronal cell culture unit, the mouse behavioral unit and the zebrafish unit. The research groups are well networked within the NC, as well as both nationally and internationally. The research results are published in as high quality journals as possible with on average 40 publications per year, of which 8 publications on average have been in scientific series with impact factor ≥ 8 .

The NC is active in postgraduate training with 20 doctoral theses completed from the center between 2005 and 2010. Several doctorate students have positions in one of the three graduate schools closely linked to the NC: the national Finnish Graduate School of Neuroscience and the Graduate Schools in Biomedicine and in Biotechnology and Molecular Biology of the University of Helsinki. The NC provides a wide range of research-based teaching that covers research areas within the NC and that integrates recent research with undergraduate and graduate courses. The NC has a central role in organizing the teaching curriculum of The Master's Degree Program in Neuroscience, launched recently in cooperation with the Faculty of Biosciences.

Significance of the RC's research and doctoral training for the University of Helsinki (MAX. 2200 characters with spaces): Neuroscience is globally accepted as a key multidisciplinary field with a central position not only in biomedicine but also in psychology, the humanities and technology. It seems therefore obvious that the University of Helsinki as a leading European multi-disciplinary university must have an institution devoted to neuroscience. In the latest Public Service Review (European Union: issue 20, pp. 396-397), the NC represents neuroscience research in Finland.



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In addition to obvious academic reasons, neuroscience has a strong societal impact. This is due to the enormous burden of brain disorders to the societies. Novel innovative strategies to diagnosis and treatment of neurodegenerative and psychiatric disorders are therefore urgently needed in the current society. Basic research of normal and diseased nervous system is the key to resolve this problem. Until now, the NC research has created 3 spin-off companies working with potential solutions to diagnostics and treatment of brain disorders. As another example of societal interactions, the NC research has created part of the exhibition "Maailmaa mullistava tiede-Science Changing the World" that is being displayed in the Finnish Science Center Heureka and will be presented in 2011-2013 in science centers in Hague, Paris and Lisbon.

The NC groups participate actively in the teaching programs of three graduate schools: Finnish Graduate School of Neuroscience (FGSN), Helsinki Graduate School in Biotechnology and Molecular Biology (GSBM) and Helsinki Biomedical Graduate School (HBGS). FGSN is a national graduate school chaired by the NC research director Kai Kaila. GSBM is an inter-campus graduate school operating in Viikki and Meilahti that was founded and chaired several years by the NC director Heikki Rauvala (currently a board member). HBGS is a medically oriented graduate school operating on the Meilahti campus.

Keywords: basic neuroscience research; brain diseases; societal impact; graduate schools

6 QUALITY OF RC'S RESEARCH AND DOCTORAL TRAINING

Justified estimate of the quality of the RC's research and doctoral training at national and international level during 2005-2010 (MAX. 2200 characters with spaces): The NC has created an active and stimulating environment to study new questions in all major areas of neuroscience, from genetics and molecular interactions and single channels to network activities in human brain. This is reflected by the strong external funding of the research groups, highly cited publications in leading journals and the engagement of NC scientists in several networks and positions of trust. Over 50% of all investigators are PhDs implicating a mature structure of the research staff. Interactive research within the NC has produced a number of breakthrough findings. These areas include novel roles of co-transporters, mechanisms of activity-dependent and drug-induced plasticity, and synchrony in the frequency bands of human brain. Scientists within the NC are involved in two Centres of Excellence of the Academy of Finland and actively engaged in international networks, including EPICURE, EU COST, NORDFORSK. They are frequent evaluators of foreign research organizations, and serve in editorial boards of distinguished journals.

Despite its relatively small size, the NC maintains three core facilities important for the whole university. The core facilities provide high-quality expert advice and services to the research community in mouse behavioral phenotyping, in novel imaging and behavioral methods of zebrafish, and in neuronal cell culture. The NC is strongly committed to high-quality research-based teaching within several areas of neurosciences.



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The NC is committed to high-quality doctoral training organized mainly in the graduate schools. The curricula of the graduate schools, in which the NC is actively involved, provide a framework of the training, with several students having been successful in the competition for a salaried position. The high-quality research projects within the NC groups, however, are central in the training. All PhD students have an outside thesis follow-up group ensuring doctoral training of highest possible standards. Several young scientists have been recruited from the center to leading institutes around the world after completing their training within the NC.

Comments on how the RC's scientific productivity and doctoral training should be evaluated (MAX. 2200 characters with spaces): A thorough peer review, consisting of analysis of publication record, citations, invitations to major meetings and seminars, quality of research questions, originality of research, interactions within the center and international activities are all valid methods to analyze the NC. Although the NC is not primarily a teaching organization, its strong role in interdisciplinary teaching of all areas of neuroscience on doctoral (and also graduate) level should be considered. In addition to the number of doctoral degrees, the NC would like to see an evaluation of the current status of the former members. The value of the core facilities would be best evaluated by site visits and discussions with the younger group members. With respect to the cores facilities, it should be taken into account that they have been established and maintained from the basic funding of the NC, without special national core facility funding. They would greatly benefit from core funding, which would contribute to success of not only the NC but the whole university. In addition to purely scientific results, the activities should also be evaluated for commercial potential and societal impact. Several discoveries have led to new applications, commercial activities and cooperation with drug companies. The NC has been active now for 7 years, which is still rather short to evaluate the long-term effects of its foundation. However, at a time when the importance of maintaining functional ties between the campuses has become important, its role as an active bridge can also be evaluated.

LIST OF RC MEMBERS

NAME OF THE RESEARCHER COMMUNITY:			Neuron		
RC-LEADER			H. Rauvala		
CATEGORY			1		
	Last name	First name	PI-status (TUHAT, 29.11.2010)	Title of research and teaching personnel	Affiliation
1	Airaksinen	Matti	x	Group leader	Neuroscience Center
2	Paatero	Anja		Post-doctoral fellow	Neuroscience Center
3	Rossi	Jari		Post-doctoral fellow	Neuroscience Center
4	Kupari	Jussi		Graduate student	Neuroscience Center
5	Laakso	Tiina		Graduate student	Neuroscience Center
6	Markkanen	Marika		Graduate student	Neuroscience Center
7	Tornberg	Janne		Graduate student	Neuroscience Center
8	Uvarov	Pavel		Graduate student	Neuroscience Center
9	Castrén	Eero	x	Research director	Neuroscience Center
10	Anthoni	Heidi		Post-doctoral fellow	Neuroscience Center
11	Dahlström-Heuser	Vanina		Post-doctoral fellow	Neuroscience Center
12	Di Lieto	Antonio		Post-doctoral fellow	Neuroscience Center
13	Karpova	Nina		Post-doctoral fellow	Neuroscience Center
14	O'Leary	Olivia		Post-doctoral fellow	Neuroscience Center
15	Rantamäki	Tomi		Post-doctoral fellow	Neuroscience Center
16	Shmelev	Anton		Post-doctoral fellow	Neuroscience Center
17	Tiraboschi	Ettore		Post-doctoral fellow	Neuroscience Center
18	Wu	Xuefei		Post-doctoral fellow	Neuroscience Center
19	Autio	Henri		Graduate student	Neuroscience Center
20	Hokkanen	Marie-Estelle		Graduate student	Neuroscience Center
21	Knuuttila	Juha		Graduate student	Neuroscience Center
22	Lindholm	Jesse		Graduate student	Neuroscience Center
23	Hotulainen	Pirta	x	Academy Research Fellow, project leader	Neuroscience Center
24	Bertling	Enni		Post-doctoral fellow	Neuroscience Center
25	Koskinen	Mikko		Graduate student	Neuroscience Center
26	Huttunen	Henri	x	Academy Research Fellow, project leader	Neuroscience Center
27	Sivanandam	Thamil		Post-doctoral fellow	Neuroscience Center
28	Kaila	Kai	x	Research director	Department of Biosciences
29	Blaesse	Peter		Post-doctoral fellow	Department of Biosciences
30	Ahmad	Faraz		Graduate student	Department of Biosciences
31	Khirug	Stanislav		Graduate student	Department of Biosciences
32	Sipilä	Sampsä		Post-doctoral fellow	Department of Biosciences
33	Yamada	Junko		Post-doctoral fellow	Department of Biosciences
34	Khirug	Leonard	x	Academy Research Fellow, group leader	Neuroscience Center
35	Kolikova	Julia		Post-doctoral fellow	Neuroscience Center
36	Niittyykoski	Minna		Post-doctoral fellow	Neuroscience Center
37	Okuneva	Olesey		Post-doctoral fellow	Neuroscience Center
38	Osmekhin	Sergey		Post-doctoral fellow	Neuroscience Center
39	Pryazhnikov	Evgeny		Post-doctoral fellow	Neuroscience Center
40	Shintyapina	Aleksandra		Post-doctoral fellow	Neuroscience Center
41	Zobova	Svetlana		Post-doctoral fellow	Neuroscience Center
42	Molotkov	Dmitry		Graduate student	Neuroscience Center
43	Lauri	Sari	x	Academy Research Fellow, project leader	Neuroscience Center
44	Sallert	Marko		Graduate student	Neuroscience Center
45	Vesikansa	Aino		Graduate student	Neuroscience Center
46	Lehesjoki	Anna-Elina	x	Research director	Neuroscience Center
47	Kopra	Outi		Senior scientist	Neuroscience Center
48	Anttonen	Anna-Kaisa		Post-doctoral fellow	Neuroscience Center
49	Aula-Kahanpää	Nina		Post-doctoral fellow	Neuroscience Center
50	Joensuu	Tarja		Post-doctoral fellow	Neuroscience Center
51	Kettunen	Kaisa		Post-doctoral fellow	Neuroscience Center
52	Lahtinen	Ulla		Post-doctoral fellow	Neuroscience Center
53	Lehtinen	Maria		Post-doctoral fellow	Neuroscience Center
54	Polvi	Anne		Post-doctoral fellow	Neuroscience Center
55	Kousi	Maria		Graduate student	Neuroscience Center
56	Kuronen	Mervi		Graduate student	Neuroscience Center
57	Körber	Inken		Graduate student	Neuroscience Center
58	Laari	Anni		Graduate student	Neuroscience Center
59	Manninen	Otto		Graduate student	Neuroscience Center
60	Siintola	Eija		Graduate student	Neuroscience Center
61	Tegelberg	Saara		Graduate student	Neuroscience Center
62	Palva	Matias	x	University researcher, project leader	Neuroscience Center
63	Palva	Satu		Post-doctoral fellow	Neuroscience Center
64	Maila	Tomi		Graduate student	Neuroscience Center
65	Monto	Simo		Graduate student	Neuroscience Center
66	Rouhinen	Santeri		Graduate student	Neuroscience Center
67	Panula	Pertti	x	Research director	Institute of Biomedicine
68	Chen	Yu-Chia		Post-doctoral fellow	Institute of Biomedicine
69	Kudo	Hisaaki		Post-doctoral fellow	Institute of Biomedicine
70	Semenova	Svetlana		Post-doctoral fellow	Institute of Biomedicine

71	Priyadarshini	Madhusmita		Graduate student	Institute of Biomedicine
72	Sallinen	Ville		Graduate student	Institute of Biomedicine
73	Sundvik	Maria		Graduate student	Institute of Biomedicine
74	Kolehmainen	Juha		Post-doctoral fellow	Institute of Biomedicine
75	Rauvala	Heikki	x	Director	Neuroscience Center
76	Kuleshkaya	Natalia		Post-doctoral fellow	Neuroscience Center
77	Paveliev	Mikhail		Post-doctoral fellow	Neuroscience Center
78	Rouhiainen	Ari		Post-doctoral fellow	Neuroscience Center
79	Tian	Li		Post-doctoral fellow	Neuroscience Center
80	Tumova	Sarka		Post-doctoral fellow	Neuroscience Center
81	Vöikar	Vootele		University researcher, project leader	Neuroscience Center
82	Hienola	Anni		Graduate student	Neuroscience Center
83	Kiiltomäki	Marjaana		Graduate student	Neuroscience Center
84	Kuja-Panula	Juha		Graduate student	Neuroscience Center
85	Kuleskiy	Evgeny		Graduate student	Neuroscience Center
86	Mankki	Lauri		Graduate student	Neuroscience Center
87	Vanttola	Päivi		Graduate student	Neuroscience Center
88	Zhao	Xiang		Graduate student	Neuroscience Center
89	Taira	Tomi	x	Group leader	Neuroscience Center
90	Clarke	Vernon		Post-doctoral fellow	Neuroscience Center
91	Molchanova	Svetlana		Post-doctoral fellow	Neuroscience Center
92	Huupponen	Johanna		Graduate student	Neuroscience Center
93	Juuri	Juuso		Graduate student	Neuroscience Center
94	Segerstråle	Mikael		Graduate student	Neuroscience Center



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RC-SPECIFIC STAGE 2 MATERIAL

BACKGROUND INFORMATION

Name of the RC's responsible person: Rauvala, Heikki

E-mail of the RC's responsible person:

Name and acronym of the participating RC: Neuroscience Center (NC), Neuron

The RC's research represents the following key focus area of UH: 2. Elämän perusrakenne – The basic structure of life

Comments for selecting/not selecting the key focus area: The centre-of-excellence programs have been used as one criterion of key focus areas of research. From this viewpoint, the NC research belongs to the area of "The basic structure of life". The CoE "Programme of molecular neurobiology" (chaired by Heikki Rauvala) was functioning until 2006. The term of the renewed CoE "Finnish Centre of Excellence in Molecular and Integrative Neuroscience Research" (chaired by Mart Saarma) extends from the beginning of 2008 until the end of 2013. Of the current NC groups, Rauvala, Castrén, Kaila, Airaksinen and Rivera (NC group leader from the beginning of 2011) belong to this CoE. Lehesjoki belongs to the CoE "Finnish Centre of Excellence in Complex Disease Genetics".

Although the CoEs to which NC PI's belong, have been grouped to "The Basic Structure of Life", the NC could be also grouped to "The thinking and learning human being" that includes brain research. Furthermore, part of the NC research belongs to systems neuroscience that has been associated in the evaluation to "The thinking and learning human being".

1 FOCUS AND QUALITY OF RC'S RESEARCH (MAX. 8800 CHARACTERS WITH SPACES)

- **Description of the RC's research focus, the quality of the RC's research (incl. key research questions and results) and the scientific significance of the RC's research for the research field(s).**

The mission of the Neuroscience Center (NC) is to carry out top-level basic research on development and functions of healthy and diseased nervous systems. In particular, mechanistic explanations at the molecular/cellular level are searched for systems level phenomena, such as normal and pathological behaviour. To this end, research at the NC comprises four overlapping areas (molecular and cellular neuroscience, developmental neuroscience, cognitive and systems neuroscience, and basic research of the nervous system diseases), the combination of which is necessary to understand the complex processes within the nervous system.

The NC (<http://www.helsinki.fi/neurosci/>) was formally founded in 2002 and started its operation in 2003. To ensure quality of research, the NC has had an international scientific advisory board (SAB) from its beginning. The SAB evaluates the applications for the group leader and research director positions that are based on international calls. The positions are filled for 5-year terms but can be renewed based on evaluation by the SAB.

Starting the NC from scratch has made it possible to build a team of complementary expertises. Synergy between the groups is reflected in numerous common publications (see the yearly publication lists 2005-2010 starting in <http://www.helsinki.fi/neurosci/research/Publications2005.pdf>). During 2005-2010, the NC has been growing steadily, mainly based on growth of competitive outside financing; the number of research groups was 7 in 2005 and 13 at the end of 2010. Of the research groups, Airaksinen, Castrén, Kaila, Lehesjoki, Rauvala and Taira have had financing from the centre-of-excellence programs



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of the Academy of Finland during 2005-2010 (see the annual reports in http://www.helsinki.fi/neurosci/NC/annual_reports.html).

The number of publications where the NC is mentioned as a site of research has been about 50/year (range 40-55/year). Of the articles, 20-25 % have been published each year in top-tier journals (having the same or higher impact factor compared to J Neurosci); examples of this work are highlighted below as research of the highest significance for the research field.

From the methodological viewpoint, one bottleneck in the scientific community has been the lack of behavioural methods for phenotypic analysis of transgenic mice. To enhance multidisciplinary approaches to dissect normal and pathological nervous system functions, one of the first tasks of the NC was therefore to set up a mouse behavioural unit (see e.g. Vöikar et al 2005 Genes Brain Behav 4: 240-252; Zylka et al 2008 Neuron 60: 111-122).

Inhibitory neurotransmission from molecular/cellular to behavioural studies belongs to key subjects studied at the NC during 2005-2010. In particular, the key role of chloride homeostasis and the chloride transporters, such as KCC2, have been intensively investigated by the group of professor Kai Kaila and other groups of the NC (Blaesse et al 2006 J Neurosci 26: 10407-10419; Uvarov et al 2006 J Neurosci 26: 13463-13473; Huberfield et al 2007 J Neurosci 27: 9866-9873; Li et al 2007 Neuron 56: 1019-1033; Uvarov et al 2007 J Biol Chem 28: 30570-30576; Khirug et al 2008 J Neurosci 28: 4635-4639; Sipilä et al 2009 J Neurosci 29: 6982-6988; Uvarov et al 2009 J Biol Chem 284: 13696-13704; Khirug et al 2010 J Neurosci 30: 12028-12035; reviewed in Blaesse et al 2009 Neuron 61: 821-838).

Another major topic within the NC is the genetic background and pathogenesis of epilepsies and neurodegeneration accompanying epileptic syndromes. On this research line, the Lehesjoki group has established the genetic background of Marinesco-Sjögren syndrome (Anttonen et al 2005 Nat Genet 37: 1309-1311), and implicated cystatin B in progressive myoclonus epilepsy, EPM1 (Lehtinen et al 2009 J Neurosci 29: 5910-5915). As regarding pathogenesis of seizures, the finding by the Kaila group that hyperthermia-induced respiratory alkalosis is able to precipitate seizures, is another interesting and clinically relevant finding (Schuchmann et al 2006 Nat Med 12: 817-823).

Novel mechanisms of synaptic plasticity and synaptic maturation have been revealed by the groups of Drs Sari Lauri and Tomi Taira. These groups have shown that kainate receptors are key components in the regulation of synaptic development, plasticity and network activity in brain (Lauri et al 2005 J. Neurosci 25: 4473-4484; Lauri et al 2006 Neuron 50: 415-429; Segerstrale et al 2010 J Neurosci 30: 6507-6514; reviewed in Hanse et al 2009 Trends Neurosci 32: 532-537).

The roles of neurotrophic factors in neuronal plasticity, development and drug actions is studied by the group of professor Eero Castrén and his collaborators. The Castrén group has shown a critical role for the neurotrophin BDNF (brain-derived neurotrophic factor) in learning, memory, emotionality and reactivation of developmental-like plasticity in the adult cerebral cortex (Sairanen et al 2005 J Neurosci 25: 1089-1094; Maya Vetencourt et al 2008 Science 320: 385-388; Sallert et al 2009 J Neurosci 29: 11294-11303).

The Airaksinen group has shown the requirement of the GDNF (glial cell-derived neurotrophic factor) receptor $\alpha 2$ in epidermis innervation (Lindfors et al 2006 J Neurosci 26: 1953-1960). Another research line of the group deals with LRRTM (leucine-rich repeat transmembrane proteins) proteins in neuronal development, schizophrenia, and in cognitive and behavioural evolution (Francks et al 2007 Mol Psychiatry 12: 1129-1139; 12: 1057; Linhoff et al 2009 Neuron 61: 820-839).

The cytoskeletal side in the mechanisms of synaptic development and plasticity are mainly studied by Dr. Pirta Hotulainen and her collaborators. These studies have defined mechanisms of actin polymerization and depolymerization during dendritic spine morphogenesis (Hotulainen et al 2009 J Cell Biol 185: 323-339; Hotulainen and Hoogenraad 2010 J Cell Biol 189: 619-629).



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The group of professor Heikki Rauvala focuses on cell surface adhesion and extracellular matrix molecules in neuronal development, plasticity and disorders. The group has shown that the transmembrane heparan sulfate proteoglycan N-syndecan (syndecan-3) regulates laminar development of the cerebral cortex through its interactions with growth and differentiation factors (Hienola et al 2006 J Cell Biol 174: 569-580). Roles of adhesion molecules in immune regulation and neuron/immune cell interactions form a major research line from the viewpoint of neuronal disorders (Rouhiainen et al 2007 J Leuk Biol 81: 49-58; Tian et al 2007 J Cell Biol 178: 687-700; Tian et al 2008 Blood 111: 3615-3625; reviewed in Tian et al 2009 Trends Immunol 30: 91-99).

The group of professor Pertti Panula focuses on modulatory neurotransmitter systems and their roles in brain diseases. The group has shown that histaminergic neurons protect the developing hippocampus from kainic acid-induced neuronal damage (Kukko-Lukjanov et al 2006 J Neurosci 26: 1088-1097). The group has set up the zebrafish facility and uses extensively the zebrafish model to study development and basic disease mechanisms (see e.g. Panula et al 2010 Neurobiol Dis 40: 46-57).

The group of Palva is instrumental for computational approaches required by the NC groups. The neuroinformatics approach, based on human MEG/EEG data, has been used to reveal neuronal synchrony underlying working memory networks and individual memory capacity (see e.g. Palva et al 2005 J Neurosci 25: 5248-5258; Palva and Palva 2007 Trends Neurosci 30: 150-158; Monto et al 2008 J Neurosci 28: 8268-8272; Palva et al 2010 Proc Natl Acad Sci USA 107: 7580-7585).

- **Ways to strengthen the focus and improve the quality of the RC's research.**

Active recruiting policy is instrumental to strengthen the focus and improve the quality of research. In 2010, two group leader positions were declared open from the beginning of 2011. Of 32 applicants, Drs Claudio Rivera (previously working as a group leader in the Institute of Biotechnology) and Sari Lauri (previously working as an NC project leader) were selected based on recommendation by the SAB. The recruitments strengthen considerably the NC research exploring mechanisms of synaptic plasticity and behaviour.

The NC research uses two animal models, the mouse and the zebrafish. Building of the new animal facility is a key issue for transgenic and behavioural studies of the NC. Two-photon in vivo imaging studies on cortex and automated behavioural studies are connected to transgenic work, and are currently being developed.

The zebrafish unit focuses on the nervous system and already provides the possibility for accurate analysis of neuronal networks and for behavioural assessment. The zebrafish model is now being developed as a service for the whole bioscience community.

2 PRACTISES AND QUALITY OF DOCTORAL TRAINING (MAX. 8800 CHARACTERS WITH SPACES)

- How is doctoral training organised in the RC? Description of the RC's principles for recruitment and selection of doctoral candidates, supervision of doctoral candidates, collaboration with faculties, departments/institutes, and potential graduate schools/doctoral programmes, good practises and quality assurance in doctoral training, and assuring good career perspectives for the doctoral candidates/fresh doctorates.

The NC has organized a systematic neuroscience curriculum that has been lacking in the University of Helsinki. Teaching at the NC has been organized according to the research areas covered by the Center, and includes both lecture series and hands-on courses. During 2005-2010, the regular teaching program (for current courses, see <http://www.helsinki.fi/neurosci/education/courses.html>) has had the following parts: Molecular and cellular neuroscience (responsible person: Heikki Rauvala), Developmental neuroscience (responsible person: Eero Castrén), Functional neuroanatomy (responsible



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persons: Matti Airaksinen and Pertti Panula), Synaptic signaling and plasticity (responsible persons: Tomi Taira and Sari Lauri), Systems neuroscience (responsible persons: Matias and Satu Palva) and Basic mechanisms of nervous system diseases (responsible person: Anna-Elina Lehesjoki). The courses organized by the NC are in English, and they are used for doctoral training through graduate schools. Currently, teaching provided by the NC equals the credits required for minor subject studies in neuroscience (25 ECTS credits), a doctoral degree (60 ECTS cr), or to complete a major in the international Master's Degree Programme in Neuroscience (MNEURO, 120 ECTS cr).

The members of the NC are closely connected to graduate schools/doctoral programs that are operating in the University of Helsinki. The programs are funded by the Ministry of Education and the Academy of Finland. Nine NC group leaders belong to the Management Board of the Finnish Graduate School of Neuroscience (FGSN; founder and chairman, Kai Kaila). Helsinki Graduate School in Biotechnology and Molecular Biology (GSBM; currently Helsinki Graduate Program in Biotechnology and Molecular Biology, GPBM; founded and originally chaired by Heikki Rauvala who currently works in the Management Board) is another program recruiting doctoral students focusing on molecular/cellular neuroscience. Helsinki Biomedical Graduate Program (HBGP) is the third relevant graduate school, and recruits PhD students working in biomedicine and neuroscience. Nearly all PhD students working in the research groups of the NC are registered in one of the three local doctoral programs. The NC follows the guidelines for good practices in doctoral training set by the doctoral programs and the faculties. Either the Medical Faculty or the Faculty of Biological Sciences awards the PhD degree to the successful doctoral candidate.

Tools for quality assurance in doctoral training include: (1) competitive open calls at the University's web site and through relevant national and international email lists, (2) ranking of the applicants based on a short research plan and the CV, followed by interviews of the most successful applicants, (2) scientific quality of the group leader who is responsible for the day-to-day supervision of the doctoral student, (3) the practise of forming thesis committees, consisting of the supervisor and two outside members, that monitor the progress of the PhD work in yearly meetings until the thesis is ready for dissertation, (3) wide teaching programs of high quality (specific courses of novel techniques and courses of general skills required on many research areas, such as presentation skills, English scientific writing, entrepreneurship, intellectual property rights, career planning, research ethics and handling of animals in experimental work), and (4) international collaboration of the graduate programs.

National networking within the bioscience community is an important tool for organized doctoral training in the graduate programs. During 2005-2010, FinBioNet (developed within the graduate school system by the GSBM chairman Heikki Rauvala and the GSBM coordinator Erkki Raulo) has become an established common activity of the Finnish graduate programs in biosciences. FinBioNet informs practically every bioscience group within Finland about open positions, symposia, courses and financing possibilities, and organizes common events of the graduate programs. The FinBioNet system includes 30 doctoral programs operating on the bioscience field in all universities of Finland.

In addition to systematic doctoral training, the members of the NC have been active in setting up basic master's level training in neuroscience and biotechnology. The NC group leaders have had a crucial role in launching the International Master's Program in Biotechnology (HEBIOT-program, Eero Castrén, chairman of the steering committee) that has been running since 2006. Furthermore, the teaching program of the NC has formed the basis of launching the international Master's Degree Programme in Neuroscience- MNEURO (Tomi Taira, program leader; Kai Kaila and Eero Castrén as members of the steering committee). MNEURO operates in collaboration with the Faculty of Biosciences and has been running since 2008. The master's programs form one pathway to doctoral training in the graduate schools.



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All young and advanced researchers meet at a monthly seminars, where PhD students and postdocs present their results and progress, which are then discussed. Members of the NC actively participate in the biweekly Neuroscience Seminar Series, which is the major platform for visits by internationally renowned scientists. In addition, the RC members have organized several international scientific symposia (eg. Cellular Mechanisms of Cortical Functions, 2010; NGF 2010; The 4th International HMGB1 Symposium: Signals of Tissue Damage, 2010; Early development of brain functions: Basic, clinical and translational studies, 2009; Brain Development and Plasticity in Health and Disease, 2009; Brain & Pain, 2008; Developing Brain - Emerging Mind; 2007; Cortex Inaugural Symposium, 2006) that have been important training events for PhD students and senior researchers.

- RC's strengths and challenges related to the practises and quality of doctoral training, and the actions planned for their development.

The RC's research environment is highly international and inspiring (see section 4) for young researchers. The wide national and international networks of the doctoral programs (eg. EU Marie Curie, Tempus and EMBO networks) as well as the extensive collaboration with research groups and biotechnology companies worldwide provide the students an excellent foundation for career perspectives. Furthermore, the well-organized practises in doctoral training form a strength of the RC.

The fact that the recruiting base in the Finnish bioscience community is quite small, forms a challenge. Therefore, operations to enhance systematic international recruitment are being pushed forward (see section 4).

The PhD's have been so far mainly employed by the academia, which is becoming a bottleneck in career development. Education to enhance working possibilities in companies (Doctors to companies, www.biobusiness.fi) has been therefore started. Connections to biobusiness are also provided through the Helsinki Business and Science Park.

3 SOCIETAL IMPACT OF RESEARCH AND DOCTORAL TRAINING (MAX. 4400 CHARACTERS WITH SPACES)

- Description of how the RC interacts with and contributes to the society (collaboration with public, private and/or 3rd sector).

Networking with faculties of the University of Helsinki and of other Finnish universities is a characteristic feature of the NC both in research and in doctoral training (see section 2 and Appendix 1). In addition to the universities, the NC research is linked to relevant research in organizations outside of the university system. The cooperation agreement with Folkhälsan (Appendix 1) is the most prominent example of these activities; the position and salary of professor Lehesjoki is from the NC but her laboratory and basic research facilities are in the space of Folkhälsan in Biomedicum.

The NC aims at enhancing commercialization of research results. The doctoral students are encouraged to participate in an intensive training course on biotechnology business skills. This course gives the students an extensive overview of the business environment and the prerequisites for productive business operations. Moreover, neuroscience research frequently contributes to both basic research and applied innovation, and academic entrepreneurship is encouraged in the NC.

During 2005-2007, the NC had a commercialization program in collaboration with the Institute of Biotechnology (coordinated by Castrén at the NC) that has been financed by the Finnish Funding Agency for Technology and Innovation (TEKES). As a result of this activity, Hermo Pharma Ltd. has been founded in 2008 by Castrén, Huttunen, Rauvala and Saarma. The most advanced project within Hermo Pharma Ltd. is based on reactivation of plasticity in adult brain (Castrén, see section 1), which is now entering into phase II clinical trials in an attempt to treat amblyopia ("lazy eye"). Other drug development projects of Hermo Pharma Ltd. include use of neurotrophic factors in neurodegenerative conditions



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(Saarma) and inhibition of HMGB1/RAGE signalling in inflammatory disorders (Rauvala). In addition to Hermo Pharma Ltd., two other spin-off companies have been so far created that are closely associated to the NC research. Neuroware Group Ltd. develops informatics tools, and is based on the research of the neuroinformatics group (Palva). Neurotar Ltd. is a CRO company offering imaging services to academia and industry (based on the work by the Khiroug group).

The NC groups are encouraged to present current scientific views to general audiences. Presentations in TV, radio and newspapers belong to this line of societal interactions. In addition, the NC researchers participate in organizing the Brain Awareness Week events (e.g. in 2007 a 7-day science fair directed for laymen in Sanomatalo, Helsinki).

A high-visibility window into research carried out in the NC and the University of Helsinki is provided by web-service based computer game, Cognitive Capacity Assessment (CCA), constructed by the neuroinformatics group (Palva, see section 1). The game can be used for testing and training of cognitive capacity in clinical setting, and in addition as a brain-fitness game. The game is on display in a very visible manner at the "Science Changing the World" exhibition that opened in the Finnish Science Center Heureka in 2010. The exhibition will be presented in three other science centers (Hague, Paris and Lisbon), and it is estimated to have a total of 1 million visitors.

- Ways to strengthen the societal impact of the RC's research and doctoral training.

The strength of the NC is in molecular/cellular mechanisms underlying brain development/plasticity and nervous system disorders. This provides an excellent basis to find novel drug leads. This line of activities need to be further strengthened. Therefore, common activities need to be developed with the Finnish company Orion Pharma. Furthermore, one challenge is to find common operations and shared financing with big pharma on the excellent campuses of Viikki and Meilahti (Biomedicum). To this end, the NC will organize a common meeting with Sanofi-Aventis (coordinated by Heikki Rauvala; Viikki, June 2011) to find research areas of common interest.

The RC's of the University should encourage the PI's to connect excellent science and societal interactions, e.g. when giving yearly awards (a current praxis in the University). At the end of 2010, the NC award for excellent performance was given to Docent Matias Palva for his innovative way of connecting excellent science and presenting it to general audiences (see "Science Changing the World" above).

4 INTERNATIONAL AND NATIONAL (INCL. INTERSECTORAL) RESEARCH COLLABORATION AND RESEARCHER MOBILITY (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the RC's research collaborations and joint doctoral training activities and how the RC has promoted researcher mobility.

The proportion of foreign researchers within the NC is exceptionally high; during the last few years, scientists of non-Finnish origin have constituted 40-50 % of the NC researchers. All NC groups collaborate with researchers based outside of Finland. Examples of articles published in 2005-2010 together with international collaborators are listed in Appendix 2.

The NC Scientific Advisory Board consists of 7 renowned scientists, of which one is of Finnish origin and all other are foreigners, which enhances international collaboration. The daily communication in the research groups and in teaching occurs largely in English, and all information to the personnel is transmitted in English. These features in the NC structure and practises enhance accommodation of foreigners in the environment of the NC.



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Besides long-standing and productive personal collaborative contacts of the NC group leaders with leading international groups, the NC as a whole is involved in several national and international programs directly related to research collaboration and researcher mobility.

The Finnish Centre for International Mobility (CIMO) sponsors yearly Winter Schools coordinated by two principal investigators of the NC, Prof. Panula and Dr. Khirug. The Schools bring to Finland up to 25 highly educated and motivated young scientists from Russia and Ukraine every year.

The neuroscience graduate program FGSN chaired by the NC research director Kaila is part of the CORTEX Training Network (Cooperation in Research and Training for European Excellence in Neurosciences), that was funded by the Marie Curie Mobility Actions of the EU during 2006-2009.

Since the beginning of 2010, Kaila has been the director and grant holder of an EACEA Tempus IV – funded European and Russian educational cooperation project "Postgraduate Training Network in Biotechnology of Neurosciences, BioN" to create Russian Graduate School for Neuroscience (RGSN). RGSN is the country's first graduate school that provides teaching and training exclusively in English and utilizes educational principles established in the EU member states.

Through the doctoral program FGSN and the Center's master's program MNEURO, the NC is actively involved in the Network of European Neuroscience Schools (NENS). Participation in the NENS activities has been important to create educational principles and practises in neuroscience education.

The Neuroscience Seminar series has been coordinated by the NC group leader Khirug and it attracts 10-30 renowned speakers yearly. Its flexible scheme helps strengthen student training and promotes intersectoral collaboration. Our list of speakers includes celebrated key opinion leaders from Max Planck Institutes (Germany), Stanford University, Duke University and National Institute of Health NIH (USA), University College London and University of Manchester (UK), CNRS and INSERM Institutes (France), RIKEN Brain Research Institute (Japan), Russian Academy of Science (Russia) and Karolinska Institutet (Sweden).

At the national level, the NC has extensively collaboration with faculties of the Finnish universities, with research organizations outside of the universities and with pharmaceutical industry (see section 3 and Appendix 1).

- RC's strengths and challenges related to research collaboration and researcher mobility, and the actions planned for their development.

The NC is currently an international research and teaching organization, with about half of its researchers coming from abroad. The NC is actively involved in several well-organized international programs, which is one strength related to research collaboration and researcher mobility.

One challenge in foreign recruitment is local preselection of the competent candidates. The NC and the GPBM doctoral program are actively developing contacts for local preselection of competent candidates, such as the successful project in Wuhan, in which professor Deyin Guo, currently the Dean of the renowned College of Life Sciences in Wuhan, acts as the local advisor and contact person.

Collaboration with the Aalto University includes development of new optogenetic methods that are becoming highly interesting in neuroscience. Furthermore, the NC groups are currently actively developing novel ways to analyze axonal injury and recovery, allowing electrical and optical probing of single cells, with the engineering expertise in micro and nanotechnology of the Aalto University.



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5 OPERATIONAL CONDITIONS (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the operational conditions in the RC's research environment (e.g. research infrastructure, balance between research and teaching duties).

From its inception, the NC has emphasised the need to develop research infrastructures that combine transgenic technologies in model organisms to behavioural phenotyping, imaging and electrophysiological analysis (see <http://www.helsinki.fi/neurosci/research/index.html>).

The Mouse Transgenic Unit was started in 1996 and chaired by Heikki Rauvala until 2008, when the Unit was transferred under the administration of the newly founded Animal Facility of the University of Helsinki. Currently, the NC PI Matti Airaksinen works as a Research Director of the Animal Facility who is responsible for the transgenic core facility functions on the Viikki and Meilahti campuses. During its operation, the Transgenic Unit has produced hundreds of different mouse lines to research groups located within and outside of the University of Helsinki.

To exploit transgenic models in neuroscience, the Mouse Behavioural Unit was started in 1998 and chaired by Heikki Rauvala until 2010 when Dr Vootele Vöikar was recruited to work as the NC PI who is responsible for the behavioural core facility (see http://www.helsinki.fi/neurosci/research/Mouse_behavioral_unit.html). The Behavioural Unit has set up a comprehensive test battery for behavioural phenotyping. More recently, installation of the newly developed system for home-cage automated mouse monitoring, IntelliCage, has extended the Unit's abilities.

The Zebrafish Unit is chaired by the NC Research Director Pertti Panula (see http://www.helsinki.fi/neurosci/research/zebra_fish_unit.html), and it produces services to many universities, research institutions and companies. The current infrastructure includes translation inhibition with morpholino oligonucleotides, selection of new mutants from mutation screens, studies on mutants produced with targeted lesions in genomes, cloning of new genes and other basic molecular biology techniques, analysis of developing neuronal networks using high-resolution confocal and two-photon imaging and automated quantitative behavioural analysis.

To improve quality and consistency of primary neuron cultures, the NC has a centralized Neuronal Cell Culture Unit chaired by the NC Research Director Eero Castrén (see http://www.helsinki.fi/neurosci/research/neuronal_cell_culture_unit.html). Most of the NC groups and many groups outside of the NC use the service for their research.

In addition to the core facilities discussed above, the Electrophysiology Units chaired by the NC Research Director Kai Kaila and the NC Group Leader Tomi Taira (e.g. setup for brain surgery, 3 setups for visually-guided patch clamp, in vivo 32-channel electrophysiology system, two-photon laser scanning microscopy) belong to important infrastructures of the NC that are used by several groups. Furthermore, Neuronal Imaging (e.g. stereology workstation for quantitative analysis of tissue structures, confocal microscopy, TIRF and two-photon laser scanning microscopy) belongs to key operations at the NC that is required by many research groups, and is developed by the NC Group Leader Leonard Khirug.

The research infrastructures discussed above are used for both research and teaching. Teaching duties comprise about 5-10 % of the work load of the PIs, and the rest is mainly used for research.



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- RC's strengths and challenges related to operational conditions, and the actions planned for their development.

The NC's strength lies in the structure ensuring selection of top-level research groups (see section 1) and the modern infrastructure having well-organized core functions.

The new animal facility to increase capacity in mouse mutant studies is a key issue to develop the infrastructure, and it is planned to be ready for use in 2012.

As regarding the informatics infrastructure, the Palva group is actively developing the NC Neuroinformatics Platform (based on OmniLyze). The platform allows management, analysis and efficient visualization of large experimental datasets, collaborative handling and analysis of the data by the group, and enables novel data mining approaches to be implemented.

About 60 % of the NC financing is based on competitive funding (for a proportion of the yearly outside competitive financing, see section 7; for a more detailed picture, see http://www.helsinki.fi/neurosci/NC/annual_reports.html). Even the core functions depend partially on competitive funding. The groups will be encouraged to increase the activity in applying for competitive funding.

6 LEADERSHIP AND MANAGEMENT IN THE RESEARCHER COMMUNITY (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the execution and processes of leadership in the RC, how the management-related responsibilities and roles are distributed in the RC and how the leadership- and management-related processes support high quality research, collaboration between principal investigators and other researchers in the RC, the RC's research focus and strengthening of the RC's know-how.

The NC is an independent research and teaching institute of the University of Helsinki. The administrative structure is outlined in Appendix 1.

The NC is supervised and managed by the Board (<http://www.helsinki.fi/neurosci/NC/board.html>) and the Director of the Center with the assistance of the Administrative Director. Professor Heikki Rauvala has acted as the Director and MSc Anna Mattila as the Administration Director from the inception of the NC. The connection of the NC to the faculty organization is arranged through the Board, in which the relevant faculties have their representatives (see Appendix 1).

Essential quality assurance systems are inherent in the structure of the NC. In particular, the international scientific advisory board (SAB; <http://www.helsinki.fi/neurosci/NC/SAB.html>), composed of leading experts of the field, has played a key role to develop the NC. The SAB evaluates the applications, achievements of the research groups and initiatives to start new activities in research and teaching. Evaluations by the SAB, that are based on written material and interviews during the site visits, are the most important quality criteria for the decision-making by the Board and the Director. The site visits of the SAB enable thorough discussions of the Director with the SAB on the ongoing scientific work and the ways to improve technology and know-how of the NC.

The Director is responsible for the development of the Center and its scientific profile. To this end, the Director plans the target program that includes the scientific focus, the personnel plan and the budget. The Director makes the decision to take a research group to the NC. Furthermore, the Director oversees the preparation of matters for discussion by the Board and the execution of the decisions. It is expected that the Director participates in scientific activities of the Center.

The Board discusses the target program, its personnel plan and the budget, and accepts the annual report. Based on the report of the SAB, the Board makes a proposal to the Rector of the University to



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appoint the Director. The Board gives a statement about the Director's decision to take a research group to the Center. Furthermore, the Board decides of the strategic lines of teaching.

The Administration Director is responsible for administration and finances. The Administration Director is the head of the Administrative Services Unit and Maintenance personnel.

To foster collaboration between the researchers and to enhance multidisciplinary approaches in scientific work, complementarity of the research profiles is considered when selecting new groups to the NC. Furthermore, the Neuroscience Seminar series and other common events are important to define areas of common interest. The Director organizes regularly PI meetings to discuss issues of common interest. The PI meetings form an important basis for the Director for decision making, for example when buying new instruments or starting new technologies.

The practises followed in the Center have been collected in the NC guide. The NC guide is particularly important for foreigners since it contains the practical information found to be useful when starting the work within the NC and in the Finnish society.

- RC's strengths and challenges related to leadership and management, and the actions planned for developing the processes.

The NC participated in 2005 as a start-up institute in the research assessment of the University of Helsinki. The panel chaired by Tim Hunt expresses the NC mode of operation and integration into the previously existing university system as a strength:" Given the interdisciplinary ramification of neuroscience, we believe that this model could serve as a European-wide example of how to optimize available resources within an existing university system. "

The panel concludes: "From the viewpoint of the evaluating panel, we see every reason to continue such a successfully launched enterprise and recommend a permanent establishment of this promising institution. " The biggest challenge in the NC management lies exactly here: the second 5-year term will be over at the end of 2010 but there is no decision how to continue, which makes credible leadership a challenging task. According to the central administration of the University, the result of the 2010 evaluation will be considered before deciding how the neuroscience research is organized.

7 EXTERNAL COMPETITIVE FUNDING OF THE RC

- Listing of the RCs external competitive funding, where:
 - the funding decisions have been made during 1.1.2005-31.12.2010, and
 - the administrator of the funding is/has been the University of Helsinki
- Academy of Finland (AF) - total amount of funding (in euros) AF has decided to allocate to the RC members during 1.1.2005-31.12.2010: 6310000
- Finnish Funding Agency for Technology and Innovation (TEKES) - total amount of funding (in euros) TEKES has decided to allocate to the RC members during 1.1.2005-31.12.2010: 1280000
- European Union (EU) - total amount of funding (in euros) EU has decided to allocate to the RC members during 1.1.2005-31.12.2010: 1390000
- European Research Council (ERC) - total amount of funding (in euros) ERC has decided to allocate to the RC members during 1.1.2005-31.12.2010: 0



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- International and national foundations – names of international and national foundations which have decided to allocate funding to the RC members during 1.1.2005-31.12.2010, and the amount of their funding (in euros).
 - names of the foundations: Sigrid Jusélius Foundation, Finnish Foundation for Alcohol Studies, Finska Läkaresällskapet, Magnus Ehrnrooth Foundation, Finnish Cancer Organisations, Sohlberg Foundation, Finnish Cultural Foundation, Emil Aaltonen Foundation, Letten Foundation, Jane and Aatos Erkko Foundation, Orion Farnos Research Foundation, Finnish Parkinson Foundation, Instrumentarium Science Foundation, Medicinska Understödsföreningen Liv och Hälsa
 - total amount of funding (in euros) from the above-mentioned foundations: 4460000
- Other international funding - names of other international funding organizations which have decided to allocate funding to the RC members during 1.1.2005-31.12.2010, and the amount of their funding (in euros).
 - names of the funding organizations: European Molecular Biology Organization, GlaxoSmithKline, Nordic Council of Ministers, NordForsk, The Company of Biologists, Orion, Lundbeck, Alomone Labs
 - total amount of funding (in euros) from the above-mentioned funding organizations: 240000
- Other national funding (incl. EVO funding and Ministry of Education and Culture funded doctoral programme positions) - names of other national funding organizations which have decided to allocate funding to the RC members during 1.1.2005-31.12.2010, and the amount of their funding (in euros).
 - names of the funding organizations: Biocentrum Helsinki, Biocenter Finland, Biomedicum Helsinki, EVO, NOVO, CIMO, University of Helsinki research grant, University of Helsinki (own assets), Orion Farnos, Federation of Finnish Learned Societies (TSV), Ministry of Education and Culture funded doctoral programme positions
 - total amount of funding (in euros) from the above-mentioned funding organizations: 1709000

8 RC'S STRATEGIC ACTION PLAN FOR 2011–2013 (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the RC's future perspectives in respect to research and doctoral training.

A few key issues in the NC's future perspectives have already been discussed above, such as active foreign recruitment policy and its future development (section 4), and ongoing and future perspectives in cooperation with industry (section 3). Key areas of development in the general structure of the NC are shortly discussed below.

1. Structure of the NC

The NC has currently the personnel of about 150 and 14 research groups, of which 12 work on the Viikki bioscience campus and 2 on the Meilahti medical campus (Biomedicum). The two-campus model enhances inter-campus cooperation of the University but has the disadvantage that neuroscience in the University is fragmented in many locations. Bringing the high-quality research of both campuses in a common space, either in Meilahti or in Viikki, would greatly enhance contacts of researchers with different expertises, which is required in multidisciplinary projects. The NC could serve as the model of the administrative organization, commented in the University of Helsinki evaluation in 2005 as follows: "In terms of administrative organization, the Neuroscience center, which was created recently (in operation since 2002), is a skillfully constructed institution." The possibilities to unify the neuroscience research of the two campuses is currently being investigated with the University leadership.



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2. Core facility functions of the NC

Sophisticated technologies used in modern neuroscience require centralization as core facilities used by several groups inside and outside of the NC.

Mouse transgenic approaches belong to the key methods of the NC research groups. Building of the new and modern animal facility with the capacity of about 30 000 mice is the most important operation for the transgenic units, and will facilitate use of modern technologies, such as conditional transgenic techniques. Planning of the research spaces of the new facility is currently chaired by Matti Airaksinen.

The NC has currently 3 two-photon microscopy setups, of which the latest version is currently being set up for in vivo imaging in cerebral cortex. Combined to transgenic techniques to label neurons, astrocytes or microglia, the method will be applied to visualize plasticity and regeneration of neuronal connections, for example after application of potential drugs.

In 2010, Dr. Vootele Võikar, who has been validating novel automated behavioural methods in the University of Zurich and in the company NewBehavior, was recruited to the NC as a project leader. The first steps in the use and further development in the home-cage mouse monitoring using IntelliCage have been now taken. This high-throughput approach to behavioral screening is expected to markedly increase the speed of experiments and optimally standardize housing conditions and experimental procedures with normal and genetically modified mice.

The NC has the exceptional situation in having two well-established animal models for its research. Mouse transgenics is currently offered as a service to all interested research groups, and the zebrafish facility, chaired by Panula, is being developed on the same line. From the technological viewpoint, starting zinc finger technology to produce knockout fish will be a major development in the Unit.

The major development in the neuronal cell culture core facility, chaired by Castrén, includes increase in capacity to meet the growing demand.

The informatics infrastructure, developed and chaired by Palva, is now rapidly developing to be an essential core function within the NC. The NC Neuroinformatics Platform has been so far mainly used in the context of human brain imaging but is expected to find applications in general in work where large experimental datasets are handled, such as cellular imaging and automated behavioural monitoring (see also section 5).

3. Doctoral training

To lower the age at which the PhD degree is received, which is currently about 30 years, the volume of the thesis work should be lowered, without compromising the quality of papers included in the work. Active recruiting using the Marie Curie, Tempus and EMBO networks (section 2) or other organized networking, such as that with the Wuhan University in China (section 4), will be instrumental to further develop doctoral training.

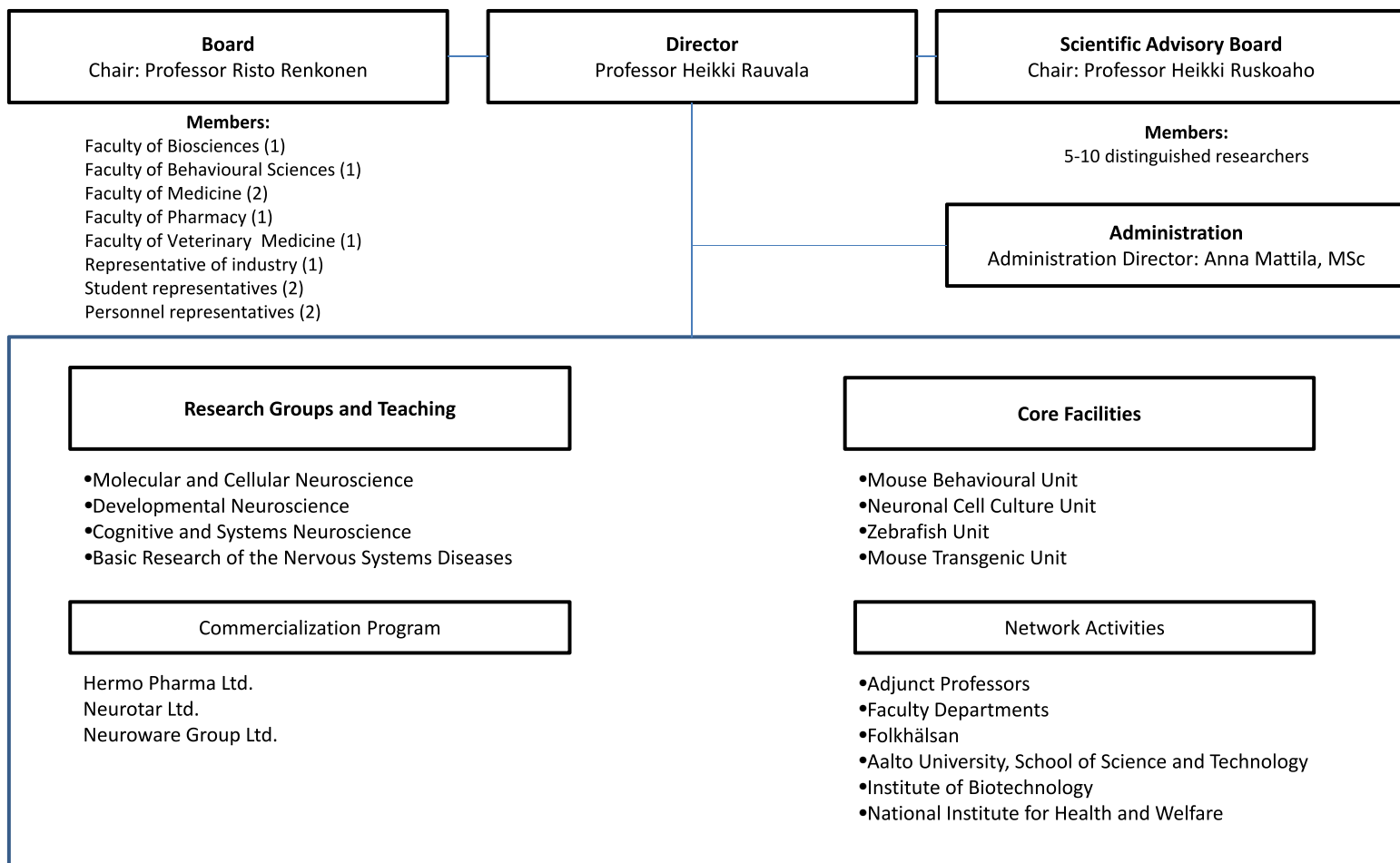
9 SHORT DESCRIPTION OF HOW THE RC MEMBERS HAVE CONTRIBUTED TO THE COMPILATION OF THE STAGE 2 MATERIALS (MAX. 1100 CHARACTERS WITH SPACES).

The topics of the evaluation have been thoroughly discussed in the PI meeting.

Based on the discussion, the NC Director Heikki Rauvala has mainly written the report. Kai Kaila has provided material and part of the text for doctoral training (section 2). Leonard Khirug has provided the first draft for international and national research collaboration and researcher mobility (section 4). Tomi Taira has provided the first text for collaboration with the Aalto University (section 4). The administration has compiled the figures for funding (section 7).

Organization of the Neuroscience Center

Appendix 1
Neuroscience Center/Heikki Rauvala
Acronym: Neuron



Neuroscience Center (NC)

Acronym: Neuron

Heikki Rauvala

Examples of articles published with foreign collaborators during 2005-2010

Castrén *et al* 2005 *Proc Natl Acad Sci (USA)* 102: 17834-17839
Coppola *et al* 2005 *J Neurol* 252: 897-900
Lauri *et al* 2005 *J Neurosci* 25: 4473-4484
Sairanen *et al* 2005 *J Neurosci* 25: 10891094
Sunden-Cullberg *et al* 2005 *Critical Care Med* 33: 564-573
Voikar *et al* 2005 *Genes Brain Behav* 4: 240-252
Blaesse *et al* 2006 *J Neurosci* 26: 10407-10419
De Witt *et al* 2006 *J Neurosci* 26: 1516-1530
Lauri *et al* 2006 *Neuron* 50: 415-429
Safiulina *et al* 2006 *J Biol Chem* 281: 23464-23470
Schuchmann *et al* 2006 *Nat Med* 12: 817-823
Francks *et al* 2007 *Mol Psychiatry* 12: 1129-1139 and 12: 1057
Huberfeld *et al* 2007 *J Neurosci* 27: 9866-9873
Lauren *et al* 2007 *J Biol Chem* 282: 5715-5725
Li *et al* 2007 *Neuron* 56: 1019-1033
Pangršić *et al* 2007 *J Biol Chem* 282: 28749-28758
Tanaka *et al* 2007 *Neuron* 54: 787-800
Tian *et al* 2007 *J Cell Biol* 178: 687-700
Uvarov *et al* 2007 *J Biol Chem* 282: 30570-30576
Colonnese *et al* 2008 *Nat Neurosci* 11: 72-79
Khirug *et al* 2008 *J Neurosci* 28: 4635-4639
Maya Vetencourt *et al* 2008 *Science* 320: 385-388
Shulga *et al* 2008 *J Neurosci* 28: 6996-7005
Zylka *et al* 2008 *Neuron* 60: 111-122
Hanse *et al* 2009 *Trends Neurosci* 32: 532-537
Kousi *et al* 2009 *Brain* 132: 810-819
Lehtinen *et al* 2009 *J Neurosci* 29: 5910-5915
Linhoff *et al* 2009 *Neuron* 61: 734-749
Schantz *et al* 2009 *Neurobiol Dis* 34: 308-319
Tervonen *et al* 2009 *Neurobiol Dis* 33: 250-259
Uvarov *et al* 2009 *J Biol Chem* 284: 13696-13704
Castrén *et al* 2010 *Neurobiol Dis* Epub 2010
Hotulainen and Hoogenraad 2010 *J Cell Biol* 189: 619-629
Segestråle *et al* 2010 *J Neurosci* 30: 6507-6514
Tolner *et al* 2010 *Epilepsia* 52: 104-114
Tsoporis *et al* 2010 *Circ Res* 106: 93-101



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RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

Neuron/Rauvala

1 Analysis of publications

- Associated person is one of Matti Airaksinen , Anja Onerva Paatero , Jari Rossi , Jussi Kupari , Tiina Laakso , Janne Tomberg, Pavel Uvarov , Eero Castrén , Vanina Dahlström-Heuser , Antonio Di Lieto , Nina Karpova , Tomi Rantamäki , Anton Shmelev, Ettore Tiraboschi , Xuefei Wu , Henri Autio , Marie-Estelle Hokkanen , Juha Knuuttila , Jesse Lindholm , Pirta Hotulainen , Enni Anita Bertling , Mikko Koskinen , Henri Juhani Huttunen , Kai Kaila , Peter Blaesse , Faraz Ahmad , Stanislaw Khirug , Sampsa Tapani Sipilä , Leonard Khirug , Yulia Kolkova , Minna Johanna Niittykoski , Evgeny Pryazhnikov , Dmitry Molotkov , Sari Lauri , Marko Sallert , Aino Vesikansa , Anna-Elina Lehesjoki , Outi Kopra , Anna-Kaisa Anttonen , Kaisa Maria Kettunen , Tarja Hannele Joensuu , Maria Kousi , Mervi Kuronen , Ulla Lahtinen , Anne Polvi , Eija Annika Siintola , Saara Susanna Tegelberg , Inken Körber , Otto Manninen , Palva , Satu Palva , Simo Monto , Santeri Rouhinen , Matias Panula , Yu-Chia Chen , Hisaaki Kudo , Madhusmita Priyadarshini , Pertti Li Tian , Ville Johannes Sallinen , Maria Sundvik , Heikki Rauvala , Natalia Kuleskaya , Mikhail Paveliev , Ari Rouhiainen , Juha Kuja-Panula , Sarka Tumova, Vootele Voikar , Anni Hienola, Marjaana Kiltomäki , Päivi Vanttola , Xiang Zhao , Evgeny Kuleskiy , Lauri Mankki , Svetlana Molchanova , Tomi Taira , Vernon Clarke , Mikael Segerstråle , Johanna Huupponen , Juuso Juuri ,

Publication type	Publication year						Total Count 2005 - 2010
	2005	2006	2007	2008	2009	2010	
A1 Refereed journal article	51	51	50	31	48	40	271
A2 Review in scientific journal	5	4	1	3	1	5	19
A3 Contribution to book/other compilations (refereed)	2	1	2	2	3	7	17
A4 Article in conference publication (refereed)				2		1	3
B1 Unrefereed journal article	3	3	1		2		9
B2 Contribution to book/other compilations (non-refereed)						1	1
B3 Unrefereed article in conference proceedings				1	1	1	3
C1 Published scientific monograph					1		1
D1 Article in professional journal				1	1	2	4
E1 Popular article, newspaper article	1				2	1	4
H1 Patents		1	1			1	3



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

Neuron/Rauvala

2 Listing of publications

A1 Refereed journal article

2005

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- Spulber, S, Rantamäki, T, Nikkilä, O, Castrén, E, Weihe, P, Grandjean, P, Ceccatelli, S **2010**, 'Effects of maternal smoking and exposure to methylmercury on Brain-Derived Neurotrophic Factor (BDNF) concentrations umbilical cord serum', **Toxicological Sciences**, vol 117, no. 2, pp. 263-269.
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A2 Review in scientific journal

2005

- Castren, E **2005**, 'Is mood chemistry?', **Nature Reviews. Neuroscience**, vol 6, no. 3, pp. 241-246.
- Rantamäki, T **2005**, 'Neurotrofiinit masennuslääkkeiden vaikutusten välittäjinä', **Dosis**, vol 21, pp. 298-307.
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2006

- Airaksinen, MS, Holm, L, Hättinen, T **2006**, 'Evolution and the GDNF family ligands and receptors', **Brain, Behavior and Evolution**, vol 68, no. 3, pp. 181-190.
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INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

Neuron/Rauvala

Panula, P, Sallinen, V, Sundvik, M, Kolehmainen, J, Torkko, V, Tiittula, A, Moshnyakov, M, Podlasz, P **2006**, 'Modulatory neurotransmitter systems and behaviour : towards zebrafish models of neurodegenerative diseases ', **Zebrafish**, vol 3, no. 2, pp. 235-247.

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2007

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2010

Castrén, E, Rantamäki, T **2010**, 'Role of Brain-Derived Neurotrophic Factor in the Aetiology of Depression Implications for Pharmacological Treatment', **CNS Drugs**, vol 24, no. 1, pp. 1-7.

Castrén, E, Rantamäki, T **2010**, 'The Role of BDNF and Its Receptors in Depression and Antidepressant Drug Action: Reactivation of Developmental Plasticity', **Developmental Neurobiology**, vol 70, no. 5, pp. 289-297.

Hölttä-Vuori, M, Salo, MTV, Nyberg, L, Brackmann, C, Enejder, A, Panula, P, Ikonen, E **2010**, 'Zebrafish: gaining popularity in lipid research', **Biochemical Journal**, vol 429, pp. 235-242.

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A3 Contribution to book/other compilations (refereed)

2005

Vanhatalo, S, Miller, J, Holmes, M, Kaila, K, Voipio, J **2005**, 'Full-band EEG in locating slow ictal events', **Epilepsy Surgery. Principles and Controversies.**, Marcel Dekker.

Vanhatalo, S, Voipio, J, Kaila, K **2005**, 'Infraslow EEG activity', in E Niedermeyer, F Lopes da Silva (eds), **Electroencephalography: Basic Principles, Clinical Applications, and Related Fields**, 5 edn, Lippincott Williams & Wilkins, Baltimore, pp. 489-493.

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2007

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2008

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RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

Neuron/Rauvala

Sipilä, ST, Kaila, K **2008**, 'GABAergic Control of CA3-driven network events in the developing hippocampus', in M Darlison (ed.), **Inhibitory Regulation of Excitatory Neurotransmission**. Springer Verlag **2008**., Results and problems in cell differentiation, **44**, Springer-Verlag, Heidelberg, pp. 99-121.

2009

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2010

Lauri, S, Taira, T **2010**, 'Role of kainate receptors in network activity during development', in A Rodríguez-Moreno, T Sihra (eds), **Kainate receptors. Novel Signaling Insights**., Advances in Experimental Medicine and Biology, vol. **717**, Georgetown Texas, Landes Bioscience,.

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Sipilä, ST, Kaila, K **2010**, 'GABAergic transmission and neuronal network events during hippocampal development', in S Pallas (ed.), **Developmental Plasticity of Inhibitory Circuitry**, Springer.

Sipilä, ST, Blaesse, P, Kaila, K **2010**, 'Development of GABAergic signaling: from molecules to emerging networks', in MS Blumberg et al, JH Freeman, SR Robinson (eds), **Oxford Handbook of Developmental Behavioral Neuroscience**, Oxford library of neuroscience, Oxford University Press, New York, pp. 108-.

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Vanhatalo, S, Voipio, J, Kaila, K **2010**, 'Infraslow EEG activity', in E Niedermeyer et al (ed.), **Electroencephalography. Basic Principles, Clinical Applications, and Related Fields**., Williams & Wilkins, Baltimore-Munich, pp. 489-493.

Vanhatalo, S, Kaila, K **2010**, 'Emergence of spontaneous and evoked EEG activity in the human brain', in H Lagercrantz, M Hanson, P Evrard, C Rod, LR Ment, DM Peebles (eds), **The Newborn Brain: Neuroscience and Clinical Applications**, 2 edn, Cambridge University Press, United Kingdom, pp. 229-244.

A4 Article in conference publication (refereed)

2008

Castren, E, Rantamäki, T **2008**, 'Neurotrophins in depression and antidepressant effects', in **Novartis Foundation symposium**.

Mahjneh, I, Somer, M, Kalimo, H, Paetau, A, Anttonen, AK **2008**, *The Marinesco-Sjogren syndrome with SIL1 mutations: follow-up study of two families with 9 patients*., European Journal of Neurology **15** WILEY-BLACKWELL PUBLISHING LTD..

2010

Raivio, N, Tiraboschi, E, Saarikoski, ST, Castren, E, Kilanmaa, K **2010**, *THE EXPRESSION PROFILE OF BRAIN-DERIVED NEUROTROPHIC FACTOR IN THE RAT BRAIN AFTER ACUTE ETHANOL EXPOSURE*., Alcoholism: Clinical and Experimental Research **34** 8 WILEY-BLACKWELL PUBLISHING, INC..

B1 Unrefereed journal article

2005

Castren, E **2005**, 'Neuronal plasticity and mood disorders', **Psychiatric Times**, vol 22, no. 11, pp. 44-45.

Donner, K, Kaila, K, Voipio, J **2005**, 'Eläinkokeiden vaikea etiikka', **Suomen lääkäri-lehti**, vol 60, no. 51/52, pp. 5304-5305.

Rantamäki, T, Castren, E **2005**, 'Aivojen kasvutekijät mahdollisina masennuslääkkeiden vaikutusten välittäjinä', **Dosis**, vol 21, no. 4, pp. 298-307.

2006



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RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

Neuron/Rauvala

Anttonen, A, Mahjneh, I, Hämäläinen, R, Lagier-Tourenne, C, Kopra, O, Waris, L, Anttonen, M, Joensuu, TH, Kalimo, H, Pateau, A, Tranebjærg, L, Chaigne, D, Koenig, M, Eeg-Olofsson, O, Udd, B, Somer, M, Somer, HVK, Lehesjoki, A **2006**, 'SiLeiksi jäävät proteiinit saavat aikaan solukuoleman', **Duodecim**, vol 122, pp. 755-756.

Castren, E, Tanila, H **2006**, 'Neurotrophins and dementia: keeping in touch', **Neuron**, vol 51, no. 1, pp. 1-3.

Valli-Jaakola, KM, Schalin-Jääntti, C **2006**, 'Lihavuusgeenit 2006', **Suomen lääkärilehti**, vol 61, pp. 1089-1094.

2007

Rantamäki, T **2007**, 'Lectio: Brain TrkB neurotrophin receptor as a target for antidepressant treatments', **Dosis**.

2009

Castren, E **2009**, 'Hermoston muovautuvuus ja masennuksesta toipuminen', **Duodecim**, vol 125, pp. 1781-1786.

Panula, P **2009**, 'Seepakala sairauksien tutkimusmallina', **Sphinx**, vol (2008-), pp. 11-18.

B2 Contribution to book/other compilations (non-refereed)

2010

Anttonen, A **2010**, 'Marinesco-Sjögren's Syndrome', in L Verhagen Metman, K Kompoti (eds), **Encyclopedia of Movement Disorders**, Elsevier Academic Press, Amsterdam, pp. 159-162.

B3 Unrefereed article in conference proceedings

2008

Pryazhnikov, E, Giniatullin, R, Khirug, L **2008**, 'TIRF study of P2X3 receptors trafficking in cultured neurons', in **Abstract book of Annual Meeting of Scandinavian Physiological Society**.

2009

Pryazhnikov, E, Khiroug, S, Coleman, SK, Keinänen, K, Jeromin, A, Khirug, L **2009**, 'Activity dependent plasma membrane insertion and internalization of Kv4.2 potassium channels in cultured hippocampal neurons', in **Abstract book of 39th SfN annual meeting**.

2010

Konsti, J, Lundin, M, Joensuu, H, Lundin, J **2010**, *Automated vision quantitative assessment of Ki-67 proliferation index in a nationwide series of patients with breast cancer*, *Virchows Archiv* 457 SPRINGER.

C1 Published scientific monograph

2009

Huttunen, HJ **2009**, *The Role of RAGE as an Amphotericin Receptor: From Development to Disease*, **Lambert Academic Publishing AG & Co.**

D1 Article in professional journal

2008

Shulga, A, Thomas-Crusells, J, Sigl, T, Blaesse, A, Mestres, P, Meyer, M, Yan, Q, Kaila, K, Saarma, M, Rivera Baeza, C, Giehl, K **2008**, 'Vaurioituneet hermosolut saavat kehityksenaikaisia ominaisuuksia', **Duodecim**, vol 124, pp. 1766.

2009

Shulga, A, Blaesse, A, Kysenius, K, Huttunen, HJ, Tanhuanpää, K, Saarma, M, Rivera Baeza, C **2009**, 'Tyroksiini edistää aivoperäisen neurotrofisen tekijän välityksellä vaurioituneiden hermosolujen selviytymistä', **Duodecim**, vol 125, no. 21.

2010

Lehesjoki, A, Gardiner, R **2010**, 'Unverricht-Lundborg disease and ceroid lipofuscinoses', **Epilepsia**, vol 51, no. Suppl 5, pp. 76.

Rantamäki, T **2010**, 'Aivoyhdyshenkilö apteekkiin', **Apteekkari : Suomen apteekkarilehti**, vol 99, no. 7-8, pp. 31.

E1 Popular article, newspaper article



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE
UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

Neuron/Rauvala

2005

Rantamäki, T **2005**, 'Miksi masennuslääke kohottaa mielialaa?', **OmaPlus**.

2009

Lehesjoki, A, Kälviäinen, R **2009**, 'Unverricht-Lundborgin etenevän myoklonusepilepsian (EPM1) tautimekanismit, Suomen Akatemian NEURO-projekti (2006-2009)', **Epilepsia-lehti**, vol 3, pp. 14-16.

Lehesjoki, A **2009**, 'Etenevän myoklonus-epilepsian (EPM1) tautimekanismit', **Epilepsia-lehti**, vol 41, no. 3, pp. 14-16.

2010

Rantamäki, T **2010**, 'Änkytys lähtee aivoista, mutta miten', **Puheenvuoro**.

H1 Patents

2006

Airaksinen, M, Lindahl, MS, Timmusk, T, Poteriaev, D, Rossi, J, Saarma, M **2006**, *Patentti: Compounds related to or derived from GFR/IN4 and their use*, EP 1257581 .

2007

Saarma, M, Laurikainen, A, Hiltunen, J, Airaksinen, M, Klinge, E **2007**, *Neurotrophic factors in the treatment of peripheral nerve dysfunction of pelvic area*, EP 1 181 042 B1.

2010

Rauvala, H, Rouhiainen, A, Huttunen, HJ **2010**, *Invention disclosure: Antibodies against acetylated HMGB1 and uses thereof*.



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

Neuron/Rauvala

1 Analysis of activities 2005-2010

- Associated person is one of Matti Airaksinen , Anja Onerva Paatero , Jari Rossi , Jussi Kupari , Tiina Laakso , Janne Tomberg, Pavel Uvarov , Eero Castrén , Vanina Dahlström-Heuser , Antonio Di Lieto , Nina Karpova , Tomi Rantamäki , Anton Shmelev, Ettore Tiraboschi , Xuefei Wu , Henri Autio , Marie-Estelle Hokkanen , Juha Knuuttila , Jesse Lindholm , Pirta Hotulainen , Enni Anita Bertling , Mikko Koskinen , Henri Juhani Huttunen , Kai Kaila , Peter Blaesse , Faraz Ahmad , Stanislaw Khirug , Sampsa Tapani Sipilä , Leonard Khirug , Yulia Kolikova , Minna Johanna Niittykoski , Evgeny Priyazhnikov , Dmitry Molotkov , Sari Lauri , Marko Sallert , Aino Vesikansa , Anna-Elina Lehesjoki , Outi Kopra , Anna-Kaisa Anttonen , Tarja Hannele Joensuu , Maria Kousi , Kaisa Maria Kettunen , Ulla Lahtinen , Anne Polvi , Mervi Kuronen , Inken Körber , Otto Manninen , Eija Annika Siintola , Saara Susanna Tegelberg , Matias Palva , Satu Palva , Simo Monto , Santeri Rouhinen , Pertti Panula , Yu-Chia Chen , Hisaaki Kudo , Madhusmita Priyadarshini , Heikki Rauvala , Ville Johannes Sallinen , Maria Sundvik , Ari Rouhiainen , Natalia Kuleskaya , Mikhail Paveliev , Anni Hienola, Marjaana Kiltomäki , Li Tian , Sarka Tumova, Vootele Voikar , Evgeny Kuleskiy , Lauri Mankki , Juha Kuja-Panula , Päävi Vanttola , Xiang Zhao , Tomi Taira , Vernon Clarke , Päivi Vanttola , Svetlana Molchanova , Johanna Huupponen , Juuso Juuri , Mikael Segerstråle ,

Activity type	Count
Supervisor or co-supervisor of doctoral thesis	80
Prizes and awards	14
Editor of research journal	14
Peer review of manuscripts	172
Assessment of candidates for academic posts	30
Membership or other role in review committee	16
Membership or other role in research network	15
Membership or other role in national/international committee, council, board	73
Membership or other role in public Finnish or international organization	17
Membership or other role of body in private company/organisation	8
Participation in interview for written media	9
Participation in radio programme	8
Participation in TV programme	8
Participation in interview for web based media	2



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

Neuron/Rauvala

2 Listing of activities 2005-2010

Supervisor or co-supervisor of doctoral thesis

Eero Castrén ,

Supervised Graduate Student: Eija Koponen, Eero Castrén, 2005, Finland
Supervised Graduate Student: Jussi Väisänen, Eero Castrén, 2005, Finland
Supervised Graduate Student: Tobias Gyarfas, Eero Castrén, 2005 → 2006, Germany
Supervised graduate student: Tomi Rantamäki, Eero Castrén, 28.10.2006, Finland
Supervisor of doctoral thesis: Jesse Lindholm, Eero Castrén, 2006 → ...
Supervisor of doctoral thesis: Juha Knuuttila, Eero Castrén, 2006 → ..., Finland
Supervisor of doctoral thesis: Marie-Estelle Hokkanen, Eero Castrén, 2006 → ..., Finland
Supervised graduate student: Mikko Sairanen, Eero Castrén, 26.05.2007, Finland
Supervised graduate student: Topi Tervonen, Eero Castrén, 02.02.2008, Finland
Supervisor of doctoral thesis: Henri Autio, Eero Castrén, 2008 → ..., Finland
Supervised graduate student: Rimante Minkeviciene, Eero Castrén, 17.12.2009, Finland

Pirta Hotulainen ,

Supervised graduate student: Mikko Koskinen, Pirta Hotulainen, 2010 → ...

Kai Kaila ,

PhD thesis / M. Palva, Kai Kaila, 03.2005, Finland
PhD thesis supervision / I. Kirilkin, Kai Kaila, 2005 → ...
PhD thesis supervision / S. Khirug, Kai Kaila, 2005 → 2010, Finland
PhD thesis / S. Sipilä, Kai Kaila, 06.2006, Finland
PhD thesis / Z. Horn, Kai Kaila, 10.2007 → 2010, Sweden
PhD thesis supervision / A. Yukin, Kai Kaila, 2007 → ...
PhD thesis / E. Ruusuvaari, Kai Kaila, 11.2008, Finland
PhD thesis / H. Li, Kai Kaila, 02.2008, Finland
PhD thesis supervision / F. Ahmad, Kai Kaila, 01.05.2008 → 2012, Finland
PhD thesis supervision / A. Tokariev, Kai Kaila, 2009 → ...
PhD thesis / T. Viitanen, Kai Kaila, 06.2010, Finland
PhD thesis supervision / M. Helmy, Kai Kaila, 2010 → 2013, Finland

Peter Blaesse ,

PhD Thesis supervision, Peter Blaesse, 01.05.2008 → ..., Finland

Leonard Khirug ,

Co-supervision of PhD thesis by Ilya Kirilkin, Leonard Khirug, 01.01.2005 → 01.01.2012, Finland
Co-supervision of PhD thesis by Alexey Yukin, Leonard Khirug, 01.01.2007 → 01.01.2012, Finland
Co-supervision of PhD thesis of Dmytro Toptunov, Leonard Khirug, 01.12.2010 → 01.01.2015, Finland
Supervision of PhD thesis by Dmitry Molotov, Leonard Khirug, 01.01.2010 → 01.01.2014, Finland
Supervision of PhD thesis by Mikhail Kislin, Leonard Khirug, 01.10.2010 → 01.01.2015, Finland

Sari Lauri ,

Supervisor of doctoral thesis: Aino Vesikansa, Sari Lauri, 2004 → ...
Supervisor of doctoral thesis: Johanna Huupponen, Sari Lauri, 2006 → ...



INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

Neuron/Rauvala

Supervisor of doctoral thesis: Juuso Juuri, Sari Lauri, 2006 → ...

Supervisor of doctoral thesis: Marko Sallert, Sari Lauri, 2006 → ...

Supervisor of doctoral thesis: Natalia Luchkina, Sari Lauri, 2010 → ...

Supervisor of doctoral thesis: Prasanna Sakha, Sari Lauri, 2010 → ...

Anna-Elina Lehesjoki ,

Supervision of doctoral thesis: Auli Siren, Anna-Elina Lehesjoki, 2004 → 25.04.2011, Finland

Supervision of doctoral thesis: Saara Tegelberg, Anna-Elina Lehesjoki, 2004 → 2012, Finland

Supervision of doctoral thesis: Mervi Kuronen, Anna-Elina Lehesjoki, 2005 → 2012, Finland

Supervision of doctoral thesis: Hanna Västinsalo, Anna-Elina Lehesjoki, 2006 → 2011, Finland

Supervision of doctoral thesis: Jukka Kallijärvi, Anna-Elina Lehesjoki, 2006, Finland

Supervision of doctoral thesis: Kirsi Alakurtti, Anna-Elina Lehesjoki, 2006, Finland

Supervision of doctoral thesis: Riikka Hämäläinen, Anna-Elina Lehesjoki, 2006, Finland

Supervision of doctoral thesis: Maria Kousi, Anna-Elina Lehesjoki, 2007 → 2011, Finland

Supervision of doctoral thesis: Otto Manninen, Anna-Elina Lehesjoki, 2007 → 2012, Finland

Supervision of doctoral thesis: Anna-Kaisa Anttonen, Anna-Elina Lehesjoki, 2008, Finland

Supervision of doctoral thesis: Eija Siintola, Anna-Elina Lehesjoki, 2008, Finland

Supervision of doctoral thesis: Anni Laari, Anna-Elina Lehesjoki, 2009 → ..., Finland

Supervision of doctoral thesis: Inken Körber, Anna-Elina Lehesjoki, 2009 → ..., Finland

Supervision of doctoral thesis: Markus Lommi, Anna-Elina Lehesjoki, 2010 → ..., Finland

Matias Palva ,

Doctoral student supervisor: Simo Monto, Matias Palva, 2007 → 2010, Finland

Doctoral student supervisor: Santeri Rouhinen, Matias Palva, 2010, Finland

Doctoral student supervisor: Shrikanth Kulashekhar, Matias Palva, 2010, Finland

Pertti Panula ,

Supervisor of doctoral thesis: Maria Sundvik, Pertti Panula, 2005 → ..., Finland

Thesis supervision: Adrian Flores Lozada, Pertti Panula, 02.09.2005, Finland

Thesis supervision: CongYu Jin, Pertti Panula, 03.06.2005, Finland

Thesis supervision: Kimmo Michelsen, Pertti Panula, 26.08.2005, Finland

Thesis supervision: Minna-Liisa Änkö, Pertti Panula, 16.12.2005, Finland

Supervisor of doctoral thesis: Madhusmita Priyadarshini, Pertti Panula, 2007 → ...

Supervisor of doctoral thesis: Stanislav Rozov, Pertti Panula, 2007 → ...

Supervisor of doctoral thesis: Raphaela Kaisler, Pertti Panula, 2008 → 2010

Thesis supervision: Tiina-Kaisa Kukko-Lukjanov, Pertti Panula, 16.05.2008, Finland

Thesis supervision: Ville Sallinen, Pertti Panula, 22.06.2009, Finland

Supervisor of doctoral thesis: Jenni Vanhanen, Pertti Panula, 2010 → ...

Heikki Rauvala ,

Supervision of the graduate student: Ari Rouhiainen, Heikki Rauvala, 2003 → 2008

Supervision of the graduate student: Kathleen Gransalke, Heikki Rauvala, 2003 → 2009

Supervision of the graduate student: Vootele Vöikar, Heikki Rauvala, 26.08.2006

Supervision of the graduate student: Anni Hienola, Heikki Rauvala, 24.02.2007

Supervision of the graduate student: Lauri Mankki, Heikki Rauvala, 2007 → 2010



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Supervision of the graduate student: Evgeny Kuleskiy, Heikki Rauvala, 2010
Supervision of the graduate student: Juha Kuja-Panula, Heikki Rauvala, 2010
Supervision of the graduate student: Marjaana Kiiltomäki, Heikki Rauvala, 2010
Supervision of the graduate student: Päivi Vanttola, Heikki Rauvala, 2010
Supervision of the graduate student: Xiang Zhao, Heikki Rauvala, 2010

Tomi Taira ,

Supervisor of doctoral thesis: Aino Vesikansa, Tomi Taira, 2004 → ..., Finland
Supervisor of doctoral thesis: Mikael Segerstråle, Tomi Taira, 2004 → ...
Supervisor of doctoral thesis: Ivan Pavlov, Tomi Taira, 2005
Supervisor of doctoral thesis: Johanna Huupponen, Tomi Taira, 2005 → ...
Supervisor of doctoral thesis: Juuso Juuri, Tomi Taira, 2008 → ...
Supervisor of doctoral thesis: Natalia Luchkina, Tomi Taira, 2009 → ...

Prizes and awards

Eero Castrén ,

Sigrid Juselius professorship in Neuroscience, Eero Castrén, 2003 → 2012, Finland
Suomalaisen tiedeakatemian jäsen, Eero Castrén, 19.04.2004 → ..., Finland

Kai Kaila ,

Academy Professor, Kai Kaila, 1996 → 2006, Finland
Viikki Science Park Innovation Prize, Kai Kaila, 2006
Ella and Georg Ehrnrooth Foundation Honorary Prize, Kai Kaila, 2010, Finland

Sampsa Tapani Sipilä ,

Novartis prize for the best Ph.D. thesis in Finland, Sampsa Tapani Sipilä, 2007

Sari Lauri ,

Best Thesis of the year-award , Dissertationes Biocentri viikki Universitatis Helsingiensis, Sari Lauri, 1999 → ...
Thesis Prize, University of Helsinki, Sari Lauri, 1999 → ...
L'oreal - Unesco For Women in Science - Award, Sari Lauri, 2010 → ...

Anne Polvi ,

Medix-palkinto astmageenin löytäjille, Anne Polvi, 21.10.2005

Matias Palva ,

Best PhD Thesis in Neuroscience 2005, Matias Palva, 2005, Finland
Outstanding PhD thesis 2005, Matias Palva, 2005, Finland

Satu Palva ,

Novartis-Exelon award of the Finnish Brain Research Society for the Best PhD Thesis in Neuroscience, 2007., Satu Palva, 2007 → ...

Mikael Segerstråle ,

Vuoden opettaja 2009, Mikael Segerstråle, 21.04.2010

Editor of research journal

Eero Castrén ,

Editorial board member: Recent Patents on CNS Drug Discovery, Eero Castrén, 2005 → ...
Editorial board member: Brain Structure and Function, Eero Castrén, 2006 → 2010
Editorial board member: Cellular and Molecular Neurobiology, Eero Castrén, 2009 → ...



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Anna-Elina Lehesjoki ,

Annals of Medicine, Anna-Elina Lehesjoki, 01.01.2003 → 31.12.2006, Finland

Anna-Kaisa Anttonen ,

Epilepsy Research, Anna-Kaisa Anttonen, 01.01.2006 → 31.12.2006

Pertti Panula ,

Acta Histochemica, Pertti Panula, 01.01.2004 → 31.12.2010, Netherlands

Journal of Neurochemistry, Pertti Panula, 01.01.2004 → 31.12.2010

Cell and Tissue Research, Pertti Panula, 01.01.2005 → 31.12.2010, Germany

Histochemistry and Cell Biology, Pertti Panula, 01.01.2005 → 31.12.2010, Germany

Journal of Chemical Neuroanatomy, Pertti Panula, 01.01.2005 → 31.12.2010, Netherlands

Acta Physiologica, Pertti Panula, 2009, Netherlands

European journal of neuroscience, Pertti Panula, 2009

Neuroscience, Pertti Panula, 2009

Tomi Taira ,

European Journal of Neuroscience, Tomi Taira, 2008 → 2009

Peer review of manuscripts

Matti Airaksinen ,

J Neurochem Eur J Neurosci Neurobiol Disease, Matti Airaksinen, 01.01.2005 → 31.12.2005

BMC Gastroenterol, Matti Airaksinen, 01.01.2006 → 31.12.2006

Cell Tiss Res, Matti Airaksinen, 01.01.2006 → 31.12.2006

J Biol Chem, Matti Airaksinen, 01.01.2006 → 31.12.2006

J Cell Biol, Matti Airaksinen, 01.01.2006 → 31.12.2006

J Mol Histol, Matti Airaksinen, 01.01.2006 → 31.12.2006

J Neurochem, Matti Airaksinen, 01.01.2006 → 31.12.2006

Mol Cell Neurosci, Matti Airaksinen, 01.01.2006 → 31.12.2006

Neuroscience, Matti Airaksinen, 01.01.2006 → 31.12.2006

Pain, Matti Airaksinen, 01.01.2006 → 31.12.2007

International Journal of Developmental Neuroscience, Matti Airaksinen, 01.01.2007 → 31.12.2007

Journal of Anatomy, Matti Airaksinen, 01.01.2007 → 31.12.2007

Journal of Neurochemistry, Matti Airaksinen, 01.01.2007 → 31.12.2007

Molecular and Cellular Neuroscience, Matti Airaksinen, 01.01.2007 → 31.12.2007

BMC Neuroscience, Matti Airaksinen, 01.01.2008 → 31.12.2008

Cell and Tissue Research, Matti Airaksinen, 01.01.2008 → 31.12.2008

Journal of Biological Chemistry, Matti Airaksinen, 01.01.2008 → 31.12.2008

Journal of Neurochemistry, Matti Airaksinen, 01.01.2008 → 31.12.2008

Neuropsychopharmacology, Matti Airaksinen, 01.01.2008 → 31.12.2008

Neuroscience, Matti Airaksinen, 01.01.2008 → 31.12.2009

Trends in Neurosciences, Matti Airaksinen, 01.01.2008 → 31.12.2008

Molecular Pain, Matti Airaksinen, 2009

The Journal of Neuroscience, Matti Airaksinen, 2009

Referee work for scientific journals, Matti Airaksinen, 2010



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Eero Castrén ,

Biological Psychiatry, reviewer, Eero Castrén, 01.01.2006 → 31.12.2007
Brain Research, reviewer, Eero Castrén, 01.01.2006 → 31.12.2006
Epilepsy Research, reviewer, Eero Castrén, 01.01.2006 → 31.12.2006
European Journal of Neuroscience, reviewer, Eero Castrén, 01.01.2006 → 31.12.2006
FASEB Journal, reviewer, Eero Castrén, 01.01.2006 → 31.12.2006
Journal of Chemical Neuroanatomy, reviewer, Eero Castrén, 01.01.2006 → 31.12.2007
Journal of Molecular Histology, reviewer, Eero Castrén, 01.01.2006 → 31.12.2006
Journal of Neurobiology, reviewer, Eero Castrén, 01.01.2006 → 31.12.2006
Journal of Neurochemistry, reviewer, Eero Castrén, 01.01.2006 → 31.12.2008
Journal of Neuroscience Research, reviewer, Eero Castrén, 01.01.2006 → 31.12.2006
Journal of Neuroscience, reviewer, Eero Castrén, 01.01.2006 → 31.12.2008
Neurobiology of Disease, reviewer, Eero Castrén, 01.01.2006 → 31.12.2006
Neuroscience Letters, reviewer, Eero Castrén, 01.01.2006 → 31.12.2006
Neuroscience, reviewer, Eero Castrén, 01.01.2006 → 31.12.2006
British Journal of Pharmacology, reviewer, Eero Castrén, 01.01.2007 → 31.12.2007
European Neuropsychopharmacology, reviewer, Eero Castrén, 01.01.2007 → 31.12.2007
Hippocampus, reviewer, Eero Castrén, 01.01.2007 → 31.12.2007
International Journal of Neuropsychopharmacology, reviewer, Eero Castrén, 01.01.2007 → 31.12.2007
Journal of Cell Biology, reviewer, Eero Castrén, 01.01.2007 → 31.12.2007
Nature Reviews neuroscience, reviewer, Eero Castrén, 01.01.2007 → 31.12.2007
Neuropsychopharmacology, reviewer, Eero Castrén, 01.01.2007 → 31.12.2008
Proceedings of the National Academy of Sciences, USA, reviewer, Eero Castrén, 01.01.2007 → 31.12.2008
Science, reviewer, Eero Castrén, 01.01.2007 → 31.12.2007
BMC-Neuroscience, reviewer, Eero Castrén, 01.01.2008 → 31.12.2008
Brain Structure and Function, reviewer, Eero Castrén, 01.01.2008 → 31.12.2008
Epilepsy Research, reviewer, Eero Castrén, 01.01.2008 → 31.12.2008
Experimental Brain Research, reviewer, Eero Castrén, 01.01.2008 → 31.12.2008
Molecular Psychiatry, reviewer, Eero Castrén, 01.01.2008 → 31.12.2008
Psychopharmacology, reviewer, Eero Castrén, 01.01.2008 → 31.12.2008
Recent Patents on CNS Drug Discovery, reviewer, Eero Castrén, 01.01.2008 → 31.12.2008
Biological Psychiatry, reviewer, Eero Castrén, 2010 → ..., United States
Brain Structure and Function, reviewer, Eero Castrén, 2010 → ...
Hippocampus, reviewer, Eero Castrén, 2010 → ...
Journal of Neuroscience, reviewer, Eero Castrén, 2010 → ..., United States
Journal of Neuroscience, reviewer, Eero Castrén, 2010 → ..., United States
Molecular Psychiatry, reviewer, Eero Castrén, 2010, United States
Proceedings of the National Academy of Sciences, USA, reviewer, Eero Castrén, 2010 → ..., United States
Science, reviewer, Eero Castrén, 2010 → ..., United States

Pirta Hotulainen ,

Referee work for scientific journals, Pirta Hotulainen, 2010



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Henri Juhani Huttunen ,

EMBO Journal, Henri Juhani Huttunen, 2006, United Kingdom
American Journal of Pathology, Henri Juhani Huttunen, 2007, United States
Brain, Henri Juhani Huttunen, 2009, United Kingdom
Neurobiology of Disease, Henri Juhani Huttunen, 2009, United States
Journal of Neurochemistry, Henri Juhani Huttunen, 08.2010

Kai Kaila ,

Reviewer / Journal of Neurophysiology, Kai Kaila, 1992 → ...
Reviewer / NeuroImage, Kai Kaila, 1995 → ...
Reviewer / Neuroscience, Kai Kaila, 1996 → ...
Reviewer / Brain, Kai Kaila, 1998 → ...
Reviewer / Amer. J. Physiology, Kai Kaila, 2000 → ...
Reviewer / European Journal of Neuroscience, Kai Kaila, 2004 → ...
Reviewer / Journal of Neuroscience, Kai Kaila, 2004 → ..., United States
Reviewer / Journal of Physiology, Kai Kaila, 2004 → ...
Reviewer / Neurobiology of Disease, Kai Kaila, 2004 → ...
Reviewer / Neuropharmacology, Kai Kaila, 2004 → ...
Reviewer / Bioorganic & Medicinal Chemistry, Kai Kaila, 2005 → ...
Reviewer / Cerebral Cortex, Kai Kaila, 2006 → ...
Reviewer / Trends in Neurosciences, Kai Kaila, 2006 → ...
Reviewer / Epilepsia, Kai Kaila, 2008 → ...
Reviewer / Neuron, Kai Kaila, 2008 → ...
Reviewer / Annals of Neurology, Kai Kaila, 2009 → ...
Reviewer / Nature Clinical Practice, Kai Kaila, 2009 → ...
Reviewer / Nature Medicine, Kai Kaila, 2009 → ...
Reviewer / Nature Reviews Neurology, Kai Kaila, 2010 → ...

Peter Blaesse ,

Reviewer for Epilepsy Research, Peter Blaesse, 2008
Reviewer for The European Journal of Neuroscience, Peter Blaesse, 2010

Leonard Khirug ,

Glia, Leonard Khirug, 2006, United States
Journal of Cellular and Molecular Medicine, Leonard Khirug, 12.2009

Minna Johanna Niittykoski ,

PLoS ONE, Minna Johanna Niittykoski, 2010

Sari Lauri ,

Journal of Physiology, Sari Lauri, 2005 → 2010
Cerebral Cortex, Sari Lauri, 2006 → ...
Neuropharmacology, Sari Lauri, 2007 → 2011
Synapse, Sari Lauri, 2008
Brain Research, Sari Lauri, 2010 → ...

Anna-Elina Lehesjoki ,



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Neuron/Rauvala

Annals of Neurology, Anna-Elina Lehesjoki, 01.01.2004 → 31.12.2006
Annals of Medicine, Anna-Elina Lehesjoki, 01.01.2005 → 31.12.2005
European Journal of Human Genetics, Anna-Elina Lehesjoki, 01.01.2005 → 31.12.2006
Human Mutation, Anna-Elina Lehesjoki, 01.01.2005 → 31.12.2005
Biochimica et Biophysica Acta, Anna-Elina Lehesjoki, 01.01.2006 → 31.12.2006
Epilepsia, Anna-Elina Lehesjoki, 01.01.2006 → 31.12.2007
Genes Brain & Behaviour, Anna-Elina Lehesjoki, 01.01.2006 → 31.12.2006
Human Molecular Genetics, Anna-Elina Lehesjoki, 01.01.2006 → 31.12.2006
Journal of Medical Genetics, Anna-Elina Lehesjoki, 01.01.2006 → 31.12.2006
Nature Genetics, Anna-Elina Lehesjoki, 01.01.2006 → 31.12.2006
Epilepsy Research, Anna-Elina Lehesjoki, 01.01.2007 → 31.12.2007
BBA-Molecular Cell Research, Anna-Elina Lehesjoki, 01.01.2008 → 31.12.2008
Clinical Genetics, Anna-Elina Lehesjoki, 01.01.2008 → 31.12.2009
European Journal of Human Genetics, Anna-Elina Lehesjoki, 01.01.2008 → 31.12.2009
Neuropediatrics, Anna-Elina Lehesjoki, 01.01.2008 → 31.12.2009
Epilepsy Research, Anna-Elina Lehesjoki, 01.01.2009 → 31.12.2009
Nature Genetics, Anna-Elina Lehesjoki, 01.01.2009 → 31.12.2009

Anne Polvi ,

Verification of pro gradu for master's thesis, Anne Polvi, 04.2008 → ...
Manuscript reviewer in "Epilepsy Research" journal, Anne Polvi, 2009
Mentoring diploma work, Anne Polvi, 2009

Matias Palva ,

European Journal of Neuroscience, Matias Palva, 2007
Journal of Neuroscience, Matias Palva, 2007 → 2009
Journal of Neuroscience Methods, Matias Palva, 2007 → 2008
NeuroImage, Matias Palva, 2007 → 2009
Cerebral Cortex, Matias Palva, 2008 → 2009
Clinical Neurophysiology, Matias Palva, 2008
Neuroinformatics, Matias Palva, 2008
Neuroscience, Matias Palva, 2008 → 2009
Brain Research, Matias Palva, 2009
Frontiers in Neuroinformatics, Matias Palva, 2009
Journal of Cognitive Neuroscience, Matias Palva, 2009

Satu Palva ,

Peer-reviewer for grant application, Satu Palva, 2007 → 2010
Peer-reviewer for scientific journals, Satu Palva, 2007 → 2010

Pertti Panula ,

Biochemical Pharmacology, Pertti Panula, 2006
Peptides, Pertti Panula, 2006
Proceedings of the National Academy of USA, Pertti Panula, 2006
Acta histochemica, Pertti Panula, 2007 → 2008



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Neuron/Rauvala

Cell and Tissue Research, Pertti Panula, 2007 → 2008
Histochemistry and Cell Biology, Pertti Panula, 2007 → 2008
Journal of Neurochemistry, Pertti Panula, 2007 → 2008
Neuroscience, Pertti Panula, 2007
British Journal of Pharmacology, Pertti Panula, 2008
European Journal of Neuroscience, Pertti Panula, 2008 → 2009
European Journal of Pharmacology, Pertti Panula, 2008
Journal of Chemical Neuroanatomy, Pertti Panula, 2008
Brain Research, Pertti Panula, 2009
Epilepsy Research, Pertti Panula, 2009
Neurobiology of Disease, Pertti Panula, 2009
Neuroscience, Pertti Panula, 2009
Aquatic Toxicology, Pertti Panula, 19.12.2010
Brain Pathology, Pertti Panula, 27.12.2010
Brain Structure and Function, Pertti Panula, 10.12.2010
British Journal of Pharmacology, Pertti Panula, 10.11.2010
CNS neuroscience & Therapeutics, Pertti Panula, 10.04.2010
Frontiers in Neuroscience, Pertti Panula, 2010
Journal of Chemical Neuroanatomy, Pertti Panula, 10.07.2010
Journal of Comparative Neurology, Pertti Panula, 20.07.2010
Journal of Neurochemistry, Pertti Panula, 10.05.2010
Neuropathology and Applied Neurobiology, Pertti Panula, 2010
Psychopharmacology, Pertti Panula, 01.11.2010

Heikki Rauvala ,

Molecular and Cellular Neuroscience, Heikki Rauvala, 01.01.2002 → 31.12.2008
Journal of Cell Science, Heikki Rauvala, 01.01.2006 → 31.12.2008
Journal of Molecular Histology, Heikki Rauvala, 01.01.2007 → 31.12.2007
Journal of Cell Biology, Heikki Rauvala, 01.01.2008 → 31.12.2008

Tomi Taira ,

J. Neurosci, Tomi Taira, 2006
J. Physiol., Tomi Taira, 2006
Neuropharmacology, Tomi Taira, 2006 → 2008
Neuroscience, Tomi Taira, 2006 → 2007
Neuroscience Letters, Tomi Taira, 2006 → 2007
Physiological Reviews, Tomi Taira, 2006 → 2007
Synapse, Tomi Taira, 2006
Journal of Neurophysiology, Tomi Taira, 2007 → 2008, United States
Journal of Neuroscience Methods, Tomi Taira, 2007
Neuromuscular Disorders, Tomi Taira, 2007
Journal of Physiology, Tomi Taira, 2008



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Assessment of candidates for academic posts

Eero Castrén ,

Examiner of the docent application, Eero Castrén, 2006, Finland

Promotion of Agnieszka Balkowiec, Oregon Health & Science University, USA, Eero Castrén, 2008, United States

Promotion of Dr. Kobi Rosenblum, University of Haifa, Israel, Eero Castrén, 2008, Israel

Promotion of Robert Lipsky, Uniformed Services University of the Health Sciences, USA, Eero Castrén, 2008, United States

Promotion of Pierto Paolo Senna, The Scripps Research Institute, Eero Castrén, 2009, United States

Promotion of Susana Cohen-Cory, University of California at Irvine, Eero Castrén, 2009, United States

Promotion of Maribel Rios, Tufts University, Eero Castrén, 2010, United States

Promotion of Simona Capsone, Scuola Normale Superiore, Pisa Italia, Eero Castrén, 2010, Italy

Kai Kaila ,

Promotion to professor, Univ. California, Davis, Kai Kaila, 2005, United States

Gottfried Wilhelm Leibniz Prize, Kai Kaila, 2006, Germany

Professor in General Neurophysiology, Univ. Heidelberg, Kai Kaila, 2008, Germany

Promotion to professor, Univ. College London, Kai Kaila, 2008, United Kingdom

ERC-2009-Advanced Grants, ERC European Research Council Executive Agency, Kai Kaila, 2009

Promotion to professor, Univ. Oslo, Kai Kaila, 2009, Norway

Sari Lauri ,

Helsingin yliopiston tutkijatohtorin valinnat, Sari Lauri, 2007 → 2010, Finland

Anna-Elina Lehesjoki ,

Assessment of docentship of Sirpa Kivirikko, Anna-Elina Lehesjoki, 2005, Finland

Assessment of Docentship of Maija Castren, Anna-Elina Lehesjoki, 2006, Finland

Assessment of docentship of Hannes Lohi, Anna-Elina Lehesjoki, 2006

Pertti Panula ,

Examiner of the docent application, Pertti Panula, 15.02.2006, Finland

Evaluation of candidates for professorship, Pertti Panula, 2009, United States

Evaluation of a candidate for Volwiler Research Fellow, Pertti Panula, 2010 → ..., United States

Evaluation of assistant professor for tenure, Pertti Panula, 2010, United States

Heikki Rauvala ,

Assessment of candidates for academic posts: Professor, Heikki Rauvala, 2006

Assessment of candidates for academic posts: Professor, Heikki Rauvala, 04.01.2007

Examiner of the docent application, Heikki Rauvala, 23.08.2007, Finland

Examiner of the docent application, Heikki Rauvala, 15.10.2008

Examiner of the docent application, Heikki Rauvala, 2009

Examiner of the docent application of Runkuan Yang, Heikki Rauvala, 09.2010, Finland

Tomi Taira ,

Evaluation of candidates for professorship level post, Tomi Taira, 2006, Finland

Examiner of the docent application, Tomi Taira, 2009, Sweden

Membership or other role in review committee

Matti Airaksinen ,

Evaluation Panel of Research Council of Norway, Matti Airaksinen, 08.2006 → 09.2006, Norway



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Grant evaluator, National University of Singapore, Matti Airaksinen, 2008, Singapore

Grant evaluator, University of Marseille, Matti Airaksinen, 2008, France

Kai Kaila ,

Research Council of Norway, Kai Kaila, 1996 → ..., Norway

Academy of Finland, Kai Kaila, 17.02.2005

Reviewer / French National Research Agency (ANR), Kai Kaila, 2006 → ..., France

Reviewer / European Research Council Executive Agency (ERCEA), Kai Kaila, 2008 → ...

Reviewer / European Science Foundation (ESF), Kai Kaila, 2008 → ...

Sari Lauri ,

Helsingin Yliopiston 3-vuotiset tutkimusmäärärahat, Sari Lauri, 2010 → ...

Pertti Panula ,

ANR/INSERM, Pertti Panula, 2009, France

ATIP: Creation D'Equipe, Pertti Panula, 2009, France

Heikki Rauvala ,

Member of an International Expert Panel Evaluating Research Projects for the Research Council of Norway, Heikki Rauvala, 2006, Norway

Acting as a Evaluator for Research Council of Norway, Heikki Rauvala, 23.01.2007, Norway

An Overall Evaluation of Research at Uppsala University, Evaluation panel 23, Heikki Rauvala, 07.05.2007 → 13.05.2007, Sweden

Acting as an Evaluator for European Science Foundation (ESF), Heikki Rauvala, 10.01.2008

Evaluator of the Research Council of Norway; Division for Science, Biology and Biomedicine, Heikki Rauvala, 03.05.2010, Norway

Membership or other role in research network

Eero Castrén ,

Suomen Aivosäätiö, suunnittelutoimikunnan puheenjohtaja, Eero Castrén, 2004 → 2006, Finland

EU FP6 Research Project: member, Eero Castrén, 2007 → 2010, Italy

Member, Scientific advisory board, ERA-Net NEURON programme, EU, Eero Castrén, 2007 → ..., Belgium

Member, Finnish Centre of Excellence in Molecular and Integrative Neuroscience Research, Eero Castrén, 2008 → 2013, Finland

The Finnish Neurodegeneration Initiative: Chairman, Eero Castrén, 2010 → ..., Finland

Kai Kaila ,

Member of the Academy of Finland CoE in Molecular Neurobiology, Kai Kaila, 1999 → 2005

Fellow of the Biocentrum Helsinki Organization, Kai Kaila, 2004 → 2013

Member of Nordic CoE for Research in Water Imbalance Related Disorders, Kai Kaila, 2005 → 2009

Cortex Training Network (Marie Curie EST), Kai Kaila, 01.01.2006 → 31.12.2009

EU FP6 Integrated project EPICURE, Kai Kaila, 2007 → 2011

Member of the Finnish CoE in Molecular and Integrative Neuroscience Research, Kai Kaila, 2008 → 2013, Finland

Nordic-Russian postgraduate training network in neuroscience, Kai Kaila, 2009 → 2010

Pertti Panula ,

EU COST BM0804 EuFishBiomedNet, Pertti Panula, 24.06.2009 → 23.06.2013

EU COST BM0806 Recent advances in histamine receptor H4R research, Pertti Panula, 09.04.2009 → 08.04.2013

Integrative Fish Behavioral Neuroscience Network NORDFORSK, Pertti Panula, 01.09.2010 → 30.12.2012



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Neuron/Rauvala

Membership or other role in national/international committee, council, board

Matti Airaksinen ,

HY rahastot, apurahatoimikunta, Matti Airaksinen, 2008

HY tiedesäätiö, Matti Airaksinen, 2009, Finland

Telethon, France, Matti Airaksinen, 2009, France

Eero Castrén ,

Duodecim, apurahalautakunta, Eero Castrén, 2004 → 2006, Finland

AMF France, Grant reviewer, Eero Castrén, 2005 → 2009, France

ECNP Scientific Advisory Panel member, Eero Castrén, 2005 → ..., Netherlands

Puheenjohtaja, Helsingin seudun bioteknologian koulutuksen ohjausryhmä, Eero Castrén, 2005 → 2006, Finland

Swiss NSF, Grant reviewer, Eero Castrén, 2005 → 2009, Switzerland

Thrasher Fund, Eero Castrén, 01.01.2006 → 31.12.2006, United States

European Research Council, Eero Castrén, 20.08.2007

NIMH, Review Committee member, Eero Castrén, 2007, United States

National Institute of Mental Health, USA, Eero Castrén, 09.10.2007, United States

ERC, Grant reviewer, Eero Castrén, 2009, Belgium

FWF Austria, Grant reviewer, Eero Castrén, 2009, Austria

McArthur Foundation, Grant reviewer, Eero Castrén, 2009, United States

Wellcome Trust, Grant reviewer, Eero Castrén, 2009, United Kingdom

ANR, France, Grant reviewer, Eero Castrén, 2010, France

ASLA-Fulbright, Grant reviewer, Eero Castrén, 2010, United States

Danish Council for Independent Research, arviointipaneelin jäsen, Eero Castrén, 28.05.2010, Denmark

ERA-Neuron, Grant reviewer, Eero Castrén, 2010, Belgium

ESF, Grant reviewer, Eero Castrén, 2010, France

ESF, Reviewer pool member, Eero Castrén, 2010 → ..., France

Israel Science Foundation, Grant reviewer, Eero Castrén, 2010, Israel

Marie-Estelle Hokkanen ,

Forskarskolans elevråd, Marie-Estelle Hokkanen, 01.01.2008 → 31.12.2008

Pirta Hotulainen ,

Board member in Brain research Society of Finland, Pirta Hotulainen, 01.01.2010 → 31.12.2010

Henri Juhani Huttunen ,

Tekes julkisen tutkimuksen projekti, johtoryhmän jäsen, Henri Juhani Huttunen, 04.2010 → ...

Kai Kaila ,

Reviewer / Swedish Natural Science Research Council, Kai Kaila, 1996 → ..., Sweden

Finnish Graduate School of Neuroscience (FGSN), Kai Kaila, 1998 → 2011, Finland

Reviewer / National Health and Medical Research Council (Australia), Kai Kaila, 1998 → ..., Australia

Reviewer / Israel Science Foundation, Kai Kaila, 1999 → ..., Israel

Reviewer / Wellcome Trust, Kai Kaila, 2000 → ..., United Kingdom

Reviewer / Biotechnology and Biological Sciences Research Council (UK), Kai Kaila, 2001 → ..., United Kingdom

Reviewer / Deutsche Forschungsgemeinschaft (SFB evaluations), Kai Kaila, 2004 → ..., Germany

Finnish Graduate School of Neuroscience, Kai Kaila, 01.01.2006 → 31.12.2006



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Institute of Biotechnology, University of Helsinki - Member of the Executive Committee, Kai Kaila, 2008 → ...

Chairman/coordinator/grant holder of EACEA Tempus project, Kai Kaila, 14.01.2010 → 13.01.2013

Leonard Khirug ,

Society for Neuroscience, USA, Leonard Khirug, 1998 → 2009, United States

Federation of European Neuroscience Societies, Leonard Khirug, 2003 → 2009, United States

Human Frontier Science Program Organization, Leonard Khirug, 2008

Sari Lauri ,

Steering committee for the international Master's program in Neuroscience, member, Sari Lauri, 2009 → 2011

Suomen Akatemian SIGHT 2009 työpajan jäsen, Sari Lauri, 15.09.2009, Finland

Anna-Elina Lehesjoki ,

Research Council for Health, Academy of Finland, Anna-Elina Lehesjoki, 2002 → 2006, Finland

European Molecular Biology Organization (EMBO), Anna-Elina Lehesjoki, 2003 → ..., Germany

Joint Committee of the Nordic Medical Research Councils NOS-M, Anna-Elina Lehesjoki, 2004 → 2009, Finland

Nordisk samarbetsnämnd för medicinsk forskning, Anna-Elina Lehesjoki, 01.01.2004 → 31.12.2008

Suomen akatemia, terveyden tutkimuksen toimikunta, Anna-Elina Lehesjoki, 01.01.2004 → 31.12.2009, Finland

Suomen akatemia, terveyden tutkimuksen toimikunta, Anna-Elina Lehesjoki, 01.01.2004 → 31.12.2009, Finland

The Finnish Genome Center, University of Helsinki, Anna-Elina Lehesjoki, 2005 → 2007, Finland

Wellcome Trust, Anna-Elina Lehesjoki, 01.01.2005 → 31.12.2006

Institute of Molecular Medicine Finland (FIMM), Anna-Elina Lehesjoki, 2007 → ..., Finland

Estonian Research Council, External reviewer, Anna-Elina Lehesjoki, 2009, Estonia

External reviewer, Embo Fellowship, Anna-Elina Lehesjoki, 2009, Germany

Suomen Akatemia, Nordiska samarbetsnämnden för medicinsk forskning (NOS-M), Anna-Elina Lehesjoki, 2009, Finland

Bioteekniikan instituutti, johtokunta, Anna-Elina Lehesjoki, 2010 → ..., Finland

Governance Committee of the International Genetics Consortium of the International League Against Epilepsy (ILAE), Anna-Elina Lehesjoki, 2010 → ...

Institute of Biotechnology, University of Helsinki, Anna-Elina Lehesjoki, 2010 → ..., Finland

Anna-Kaisa Anttonen ,

Suomen Lääketieteellisen Genetiikan Yhdistys ry., Anna-Kaisa Anttonen, 24.03.2006 → 31.12.2006, Finland

Maria Kousi ,

Society for Neuroscience, USA, Maria Kousi, 2008, United States

Mervi Kuronen ,

Secretary of Societas biochemica, biophysica et microbiologica Fenniae, Mervi Kuronen, 01.08.2009 → ...

Matias Palva ,

Wellcome Trust, Matias Palva, 2007

Wellcome Trust, peer-reviewer, Matias Palva, 2010

Pertti Panula ,

International federation of societies for histochemistry and cytochemistry, Pertti Panula, 01.02.2001 → 30.08.2008

Suomen Histokemian ja solubiologian seura, Pertti Panula, 2001 → 2010, Finland

European Histamine Research Society, Pertti Panula, 2005 → 2007

Heikki Rauvala ,

Board of Helsinki Graduate School in Biotechnology and Molecular Biology, Heikki Rauvala, 01.01.2006 → 31.12.2006, Finland

Board of the Animal Facility of the University of Helsinki, Heikki Rauvala, 2006



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Tomi Taira ,

Helsingin yliopiston tiedesäätiö, Tomi Taira, 2006 → 2007, Finland
Network of European Neuroscience Schools, Tomi Taira, 2006 → 2007
Suomen Aivotutkimusseura, Tomi Taira, 2006 → 2009
Suomen Akatemia, Tomi Taira, 2006, Finland
TEMPUS Master's program in Neuroscience, Univ. St Petersburg, Tomi Taira, 2006 → 2007, Russia
CIMO, Tomi Taira, 2007, Finland
Network of European Neuroscience Schools, Tomi Taira, 2010 → 2012

Membership or other role in public Finnish or international organization

Matti Airaksinen ,

Finnish Brain Research Society, Matti Airaksinen, 01.01.2001 → 31.05.2009, Finland
Koe-eläintoimikunta, Helsingin yliopisto, Matti Airaksinen, 01.01.2005 → 31.12.2006, Finland

Eero Castrén ,

Finnish Brain Research Society: chairman, Eero Castrén, 2003 → 2006, Finland
Finnish Brain Research Society: Board member, Eero Castrén, 2006 → 2009, Finland
HEBIOT -koulutusohjelman ohjausryhmä, Eero Castrén, 01.01.2006 → 31.12.2006, Finland
Tieteellisen neuvoston jäsen, Eero Castrén, 2007 → 2009, Finland

Kai Kaila ,

Member of Societas Scientiarum Fennica (Suomalainen Tiedeakatemia), Kai Kaila, 2001 → ...
Member of Academia Scientiarum Fennica, Kai Kaila, 2004 → ..., Finland
Committee for research affairs, Kai Kaila, 2008 → 2013
AVARA-varainhankintakampanja, Kai Kaila, 2009 → ...

Leonard Khirug ,

Societas Biochemica, Biophysica et Microbiologica Fenniae (Biobio), Leonard Khirug, 2006 → 2009, Finland
Foreign Ministry of Finland, interview on the immigrant integration issues, Leonard Khirug, 2008
Grant Application Evaluator, Leonard Khirug, 2010, France

Sari Lauri ,

Brain Research Society of Finland, Sari Lauri, 01.01.2004 → 31.12.2005, Finland
Brain Research Society of Finland, member of the board, Sari Lauri, 2010 → 2011

Heikki Rauvala ,

Helsingin yliopiston koe-eläinkeskuksen johtokunta, Heikki Rauvala, 01.01.2007 → 31.12.2009, Finland
Board Member of SHOK Planning Group, Heikki Rauvala, 01.01.2008 → 31.12.2008, Finland

Membership or other role of body in private company/organisation

Eero Castrén ,

Novamass, Ltd, member of the board, Eero Castrén, 2007 → 2009, Finland
Hermo Pharma, member of the Board, Eero Castrén, 2008 → 2009, Finland
Hermo Pharma, member of the Scientific Advisory Board, Eero Castrén, 2009 → ..., Finland

Henri Juhani Huttunen ,

Hermo Pharma Oy, Henri Juhani Huttunen, 01.06.2008 → 31.12.2009, Finland
Hermo Pharma Oy, Henri Juhani Huttunen, 01.06.2008 → 31.12.2010, Finland



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Anna-Elina Lehesjoki ,

Folkhälsanin tutkimuskeskus, Anna-Elina Lehesjoki, 2006 → ..., Finland

Duodecim verkostovaliokunta, Anna-Elina Lehesjoki, 2007 → 2009, Finland

Heikki Rauvala ,

HermoPharma Oy, Heikki Rauvala, 01.01.2008 → ...

Participation in interview for written media

Henri Juhani Huttunen ,

Tekniikka & Talous, Henri Juhani Huttunen, 26.08.2008, Finland

Kai Kaila ,

Interview, Kai Kaila, 04.2009, Finland

Interview / Ihminen on biologinen kone, Kai Kaila, 09.2009, Finland

Heikki Rauvala ,

Kansainvälinen aivoviikko, Heikki Rauvala, 14.03.2006, Finland

Kansainvälinen aivoviikko, Heikki Rauvala, 13.03.2006 → 19.03.2006, Finland

Tiedelehti: Neurotiede, Neurotieteen tutkimuskeskus, Heikki Rauvala, 22.03.2006, Finland

Ari Rouhiainen ,

Väitöstutkimus edistää tulehdustautien kliinistä määrittelyä, Ari Rouhiainen, 01.08.2008, Finland

Tomi Taira ,

Kirkko ja Kaupunki -lehti, Tomi Taira, 28.03.2007, Finland

Haastattelu, Tomi Taira, 22.06.2010

Participation in radio programme

Eero Castrén ,

Participation in radio programme, Eero Castrén, 2008

Kai Kaila ,

YLE Terveys, Radion tiedeuutiset, Kai Kaila, 05.10.2006

Participation in radio programme, Kai Kaila, 12.02.2009

Leonard Khirug ,

Finnish State Radio YLE Mondo, Leonard Khirug, 01.01.2008, Finland

Anna-Elina Lehesjoki ,

Yle Radio 1, Anna-Elina Lehesjoki, 01.03.2007, Finland

Intervju, Radio Folkhälsan, Anna-Elina Lehesjoki, 16.05.2008, Finland

Radiohaastattelu, Yle Radio Yksi, Anna-Elina Lehesjoki, 21.01.2008, Finland

Svergies Radio, Vetenskapsredaktion, Anna-Elina Lehesjoki, 16.04.2009, Sweden

Participation in TV programme

Matti Airaksinen ,

Interview by the "Prisma" TV science program, broadcast Oct 3, 2007 in YLE1, Matti Airaksinen, 03.10.2007, Finland

Kai Kaila ,

Interview: YLE Teema, Kai Kaila, 2005

Leonard Khirug ,

Russian State Television, Leonard Khirug, 2008



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Satu Palva ,

Haastattelu Prisma TV ohjelmassa, Satu Palva, 19.03.2008, Finland

Pertti Panula ,

Significance of animal models in alcohol research, Pertti Panula, 06.10.2010

Heikki Rauvala ,

Prisma, Yle TV1, Heikki Rauvala, 19.09.2007, Finland

Tomi Taira ,

Yle Teeman tiededokumentti, Tomi Taira, 12.2007, Finland

YLE Teema 'Tutkiva juttu', Tomi Taira, 09.12.2010, Finland

Participation in interview for web based media

Kai Kaila ,

Tieteessä tapahtuu: Neurobiologia – Silta fysiikasta psykologiaan, Kai Kaila, 2006

Keskosen ensimmäinen myssy mittaa aivojen toimintoja, Kai Kaila, 10.11.2010, Finland



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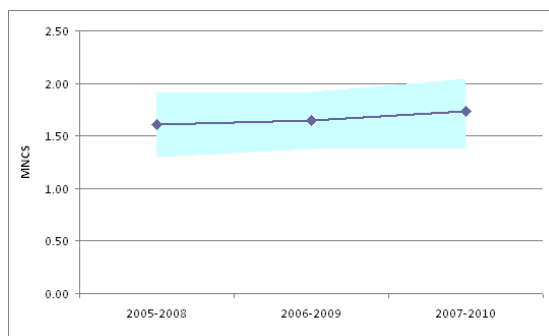
Web of Science(WoS)-based bibliometrics of the RC's publications data 1.1.2005-31.12.2010
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Research Group: Rauvala H

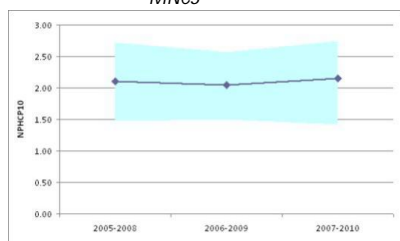
Basic statistics

Number of publications (P)	259
Number of citations (TCS)	3,588
Number of citations per publication (MCS)	13.89
Percentage of uncited publications	12%
Field-normalized number of citations per publication (MNCS)	1.64
Field-normalized average journal impact (MNJS)	1.41
Field-normalized proportion highly cited publications (top 10%)	2.03
Internal coverage	.94

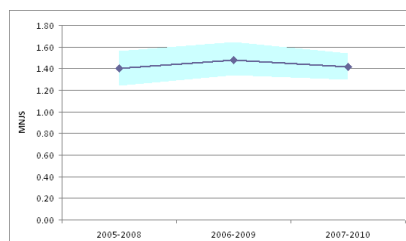
Trend analyses



MNCS

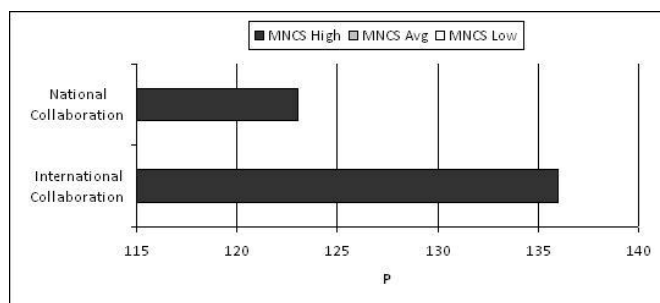


THCP10



MNJS

Collaboration



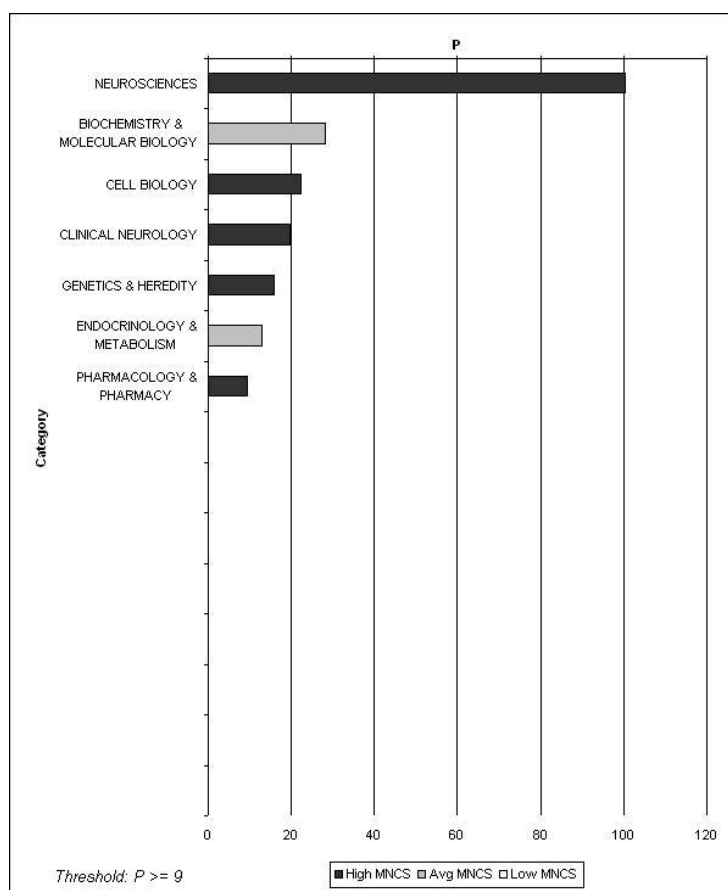
Performance (MNCS) by collaboration type



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