



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

RC-Specific Evaluation of CellMolBiol – The Research Program in Cell and Molecular Biology

Seppo Saari & Antti Moilanen (Eds.)



Evaluation Panel: Biological, Agricultural and Veterinary Sciences

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

RC-Specific Evaluation of CellMolBiol – The Research Program in Cell and Molecular Biology

Seppo Saari & Antti Moilanen (Eds.)

University of Helsinki
Administrative Publications 80/11
Evaluations
2012

Publisher:
University of Helsinki

Editors:
Seppo Saari & Antti Moilanen

Title: International Evaluation of Research and Doctoral Training at the University of Helsinki 2005–2010 : RC-Specific Evaluation of CellMolBiol – The Research Program in Cell and Molecular Biology	Type of publication: Evaluations
Summary: 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. 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. 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. Chapters in the report: 1. Background for the evaluation 2. Evaluation feedback for the Researcher Community 3. List of publications 4. List of activities 5. Bibliometric analyses 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.	
RC-specific information:	
Main scientific field of research: Biological, Agricultural and Veterinary Sciences	RC-specific keywords: Cell biology, molecular biology, cytoskeleton, transcription, cell growth, endoplasmic reticulum, virus, neuron, secretion, microscopy
Participation category: 1. Research of the participating community represents the international cutting edge in its field	
RC's responsible person: Lappalainen, Pekka	
Keywords: Research Evaluation, Meta-evaluation, Doctoral Training, Bibliometric Analyses, Researcher Community	

Series title and number:
University of Helsinki, Administrative Publications 80/11, Evaluations

ISSN:
1795-5513 (Online)

ISBN:
978-952-10-7431-8 (PDF)

Total number of pages:
63

Language:
English

Additional information:
Cover graphics: Päivi Talonpoika-Ukkonen
Enquiries: seppo.o.saari@helsinki.fi

Internet address:
http://www.helsinki.fi/julkaisut/aineisto/rc_evaluation_2012/hallinnon_julkaisu_80_11_2012.pdf

Contents

Panel members	1
1 Introduction to the Evaluation	5
1.1 RC-specific evaluation reports	5
1.2 Aims and objectives in the evaluation	5
1.3 Evaluation method	5
1.4 Implementation of the external evaluation	6
1.5 Evaluation material	7
1.6 Evaluation questions and material	8
1.7 Evaluation criteria	10
1.8 Timetable of the evaluation	13
1.9 Evaluation feedback – consensus of the entire panel	13
2 Evaluation feedback	15
2.1 Focus and quality of the RC's research	15
2.2 Practises and quality of doctoral training	15
2.3 The societal impact of research and doctoral training	16
2.4 International and national (incl. intersectoral) research collaboration and researcher mobility	16
2.5 Operational conditions	16
2.6 Leadership and management in the researcher community	16
2.7 External competitive funding of the RC	17
2.8 The RC's strategic action plan for 2011–2013	17
2.9 Evaluation of the category of the RC in the context of entity of the evaluation material (1-8)	17
2.10 Short description of how the RC members contributed the compilation of the stage 2 material ...	18
2.11 How the UH's focus areas are presented in the RC's research	18
2.12 RC-specific main recommendations	18
2.13 RC-specific conclusions	18
3 Appendices	19

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 Ary A. Hoffman

Ecological genetics, evolutionary biology,
biodiversity conservation, zoology
University of Melbourne, Australia

VICE-CHAIR

Professor Barbara Koch

Forest Sciences, remote sensing
University of Freiburg, Germany

Professor Per-Anders Hansson

Agricultural engineering, modeling, life cycle
analysis, bioenergy
Swedish University of Agricultural Sciences

Professor Danny Huylebroeck

Developmental biology
Katholieke Universiteit Leuven, Belgium

Professor Jonathan King

Virus assembly, protein folding
Massachusetts Institute of Technology MIT, USA

Professor Hannu J.T. Korhonen

Functional foods, dairy technology, milk hygiene
MTT Agrifood Research Finland

Professor Kristiina Kruus

Microbiological biotechnology, microbiological
enzymes, applied microbiology
VTT Technical Research Centre of Finland

Professor Joakim Lundeberg

Biochemistry, biotechnology, sequencing, genomics
KTH Royal Institute of Technology, Sweden

Professor Dominiek Maes

Veterinary medicine
Ghent University, Belgium

Professor Olli Saastamoinen

Forest economics and policy
University of Eastern Finland

Professor Kai Simons

Biochemistry, molecular biology, cell biology
Max-Planck-Institute of Molecular Cell Biology and
Genetics, Germany

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 the members from the other panels and by one evaluator outside the panels.

External Expert
Professor Anders Linde
Oral biochemi
Faculty of Odontology
Göteborg University
Sweden

Experts from the Other Panels

Professor Caitlin Buck, from the Panel of Natural Sciences
Professor Ritske Huismans, from the Panel of Natural Sciences
Professor Johanna Ivaska, from the Panel of Medicine, biomedicine and health sciences
Professor Lea Kauppi, from the Panel of Natural Sciences
Professor Holger Stark, from the Panel of Natural Sciences
Professor Peter York, from the Panel of Medicine, biomedicine and health 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 Mollanen, 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 Ekebon, 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

CellMolBiol is composed of senior and junior groups all located at the Institute of Biotechnology. The subject areas that the RC is engaged in span important areas in contemporary cell biology. Also virology is included and this is an ideal extension since viruses have proven to be important tools in molecular cell biological research. A strength of the RC is that the junior group leaders are well chosen with a lot of promise and potential. Cell biology is an integrative area of modern biology and therefore plays an important role in shaping modern biological research. The RC represents the cutting edge of its field and thus strengthens the international attractiveness of the Viikki Campus. The publication record is impressive and demonstrates the strengths of this RC.

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

During the years 2005-2010, a total of 17 students defended their PhD thesis and there are currently 19 students in the RC. All of the doctoral students completing their theses in the past period have obtained positions utilizing their training. The recruitment is centralized and thus up to present top standards. More than 50% of the present PhD students are foreigners, attesting to the attractiveness of the RC. The RC runs several important courses and thus constitutes an asset to the overall quality of the Viikki Campus. The training could further be strengthened by requiring more frequent meetings of the PhD "committees", perhaps twice a year.

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 PIs in the RC are actively working in outreach activities to spread their research messages to the lay public. The societal impact could be increased by instituting "Science and Society" discussions in their programme. The PhD students need to actively consider the impact of their research on society.

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 RC has a large network of international contacts and collaborations. Already the fact they harbor so many foreign PhD students increases their international impact. Also collaborations within the RC are increasing, making the RC even more attractive for applicants. The two new recruitments also strengthen the RC to the inside and to the outside.

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 is well supported and has a state-of-the-art infrastructure at its disposal. The Light Microscopy Unit and the Electron Microscopy Unit are real strengths and need to be kept up to date. The RC plans to increase its use of high-throughput analysis technologies and screening capacities. These are very expensive areas with variable output. Great care should be taken not move into areas already overcrowded internationally and difficult to finance.

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 leader of the RC Pekka Lappalainen is doing an excellent job to promote this RC. Important is also that the overall quality of the PIs is unusual high. One reason for this is the stringent recruitment process that the Institute of Biotechnology has in place to ensure quality of its incoming PIs.

Furthermore, the regular 4-year reviews by Scientific Advisory Board and external reviewers of PIs and their research is excellent and should be used more widely across the campus to sharpen the research profile.

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

The overall funding is quite low, only around 7.5 MEUR for a large grouping. Here some work will be necessary to increase the grant flow, for instance EU funding could be augmented by the excellent infrastructure that the RC has at its disposal.

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 RC is doing its homework in an outstanding way and their strategic plan does not need much comment. They are well prepared for the future and CellMolBiol is one of the flagship RCs.

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.

The RC has chosen as its participation category: 1 'Research of participating community represents the international cutting edge of its field'. This quality of the RC corresponds well to this category and they are also well prepared to maintain the outstanding status that they have reached.

Numeric evaluation: 5 (Outstanding)

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

All members contributed.

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

Focus area 2: The basic structure of life

The research with the RC is in line with the focus areas of the University of Helsinki.

2.12 RC-specific main recommendations

–

2.13 RC-specific conclusions

–

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:

The Research Program in Cell and Molecular Biology (CellMolBio)

LEADER OF THE RESEARCHER COMMUNITY:

Professor Pekka Lappalainen, Institute of Biotechnology

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: Lappalainen, Pekka

E-mail:

Phone: 09-19159499

Affiliation: Institute of Biotechnology

Street address: Viikinkaari 9

2 DESCRIPTION OF THE PARTICIPATING RESEARCHER COMMUNITY (RC)

Name of the participating RC (max. 30 characters): The Research Program in Cell and Molecular Biology

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

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): The Research Program in Cell and Molecular Biology (CellMolBiol) is one of the four research programs of the Institute of Biotechnology (see: <http://www.biocenter.helsinki.fi/bi/research/index.html>). The research within this program focuses on analyzing basic principles of cell and organelle morphogenesis and dynamics, cell growth and metabolism, interactions of viruses with host cells as well as on elucidating the mechanisms by which specific processes form and function in highly specialized mammalian cells such as neurons. The research groups use mammalian and yeast cells as well as the *C. elegans* nematode and *Drosophila* fruit fly as model systems in these studies. The program also harbors two modern biological imaging centers: Light Microscopy Unit for advanced light microscopy studies on live cells and Electron Microscopy Unit, which both are national technology platforms for advanced biological imaging through Biocenter Finland organization.

The Program in Cell and Molecular Biology currently consist of seven research groups whose research interests range from cytoskeletal and membrane dynamics to the regulation of transcription and neuronal activity. In addition, two PIs who were members of the research program (Oscar Puig and Harri Savilahti) have been appointed to positions outside the institute during the years 2005-2010. The researcher community organizes joint seminar series, journal club, lecture/practical courses, and regular group leaders' meetings. In addition, several groups within this community are collaborating with each other, as indicated by a large number of joint publications and currently ongoing collaborations. Thus, CellMolBiol program is a truly cohesive researcher community.

3 SCIENTIFIC FIELDS OF THE RC

Main scientific field of the RC's research: biological, agricultural and veterinary sciences

RC's scientific subfield 1: Cell Biology



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

RC-SPECIFIC STAGE 1 MATERIAL (registration form)

RC's scientific subfield 2: Biochemistry and Molecular Biology

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

Justification for the selected participation category (MAX. 2200 characters with spaces): The Research Program in Cell and Molecular Biology is a mixture of senior and junior groups, which all are internationally well recognized and carry out top-quality research in their fields. For example, the research director of the program is among the world leading experts on actin and membrane dynamics research and is currently an executive editor of the journal Cytoskeleton (published by Wiley-Blackwell). The laboratories of Claudio Rivera, Eija Jokitalo, Jussi Jääntti and Tero Ahola are internationally recognized experts on molecular neurobiology, organelle biology, secretion and Semliki Forest virus biology, respectively. The two junior PIs the program (Vartiainen and Hietakangas) were recruited to the program after a successful international postdoctoral training. The high quality of the research is also indicated by the fact that the groups of this program regularly publish articles in top international journals such as Science, Neuron, Developmental Cell, Genes and Development, Current Biology, Journal of Cell Biology, and PNAS. The funding of the research within the RC is mainly from the highly competitive external sources. Furthermore, the core facilities administrated by this researcher community harbor several cutting edge technologies such as electron tomography, correlative light-electron microscopy, light microscopy analysis of protein dynamics in live cells, and interaction studies using fluorescence life-time imaging.

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 Research Program in Cell and Molecular Biology is one of the four research programs of the Institute of Biotechnology. The researchers of this program are interested in basic principles of cell and organelle morphogenesis and dynamics. These include for example analysis of the mechanisms of cell migration, morphogenesis, vesicle transport, and cell growth and metabolism as well as gene expression. In addition, the research groups within this program are elucidating the mechanisms by which specific processes form and function in highly specialized mammalian cells such as neurons, and how viruses interact with their host cells during the infection processes. It is important to note that defects in many of these processes are linked to diseases such as cancer, diabetes and neurodegenerative disorders. Thus, in addition to fundamental information concerning the mechanisms of central cellular processes, these studies also aim to open new avenues for diagnosis or treatment of these diseases.

The research groups of this program are also very active in doctoral training. Currently 22 students are carrying out PhD-thesis projects in the groups. Furthermore, this researcher community organizes a journal club, seminar series and several practical and lecture courses for doctoral students and post-docs. These



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

RC-SPECIFIC STAGE 1 MATERIAL (registration form)

courses/events are open for all biosciences/medicine doctoral students and will thus not only benefit the students working in the research groups of this researcher community but also other students across the campus boundaries at University of Helsinki.

Significance of the RC's research and doctoral training for the University of Helsinki (MAX. 2200 characters with spaces): The director of the Research Program in Cell and Molecular Biology (Pekka Lappalainen) is the head of the one of the largest graduate programs at University of Helsinki. The Helsinki Graduate Program in Biotechnology and Molecular Biology (GPBM) is an international Ph.D. training program administered by the Biocentrum Helsinki organization and the Institute of Biotechnology, University of Helsinki. The program has currently 50 students supported by the Ministry of Culture and Education. It organizes a large number of practical and theoretical courses for doctoral students, and supports their thesis projects/studies through travel funds and formal thesis committee work. In addition, a member of the RC (Eija Jokitalo) serves in the board of the Viikki Doctoral Program in Molecular Biosciences (VGSB), representing the field of cell biology. All research groups within the Research Program in Cell and Molecular Biology are actively organizing courses to the GPBM and VGSB graduate programs as well as other graduate programs operating at University of Helsinki. Thus, in addition to training doctoral students in their own laboratories, the senior scientists of this researcher community actively participate in the training of other doctoral students at our university through organizing courses to graduate programs and participating in the administration of graduate programs.

Keywords: Cell biology, molecular biology, cytoskeleton, transcription, cell growth, endoplasmic reticulum, virus, neuron, secretion, microscopy

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): This researcher community carries out top international quality research in the fields of cell and molecular biology. The high quality of the research is indicated e.g. by the fact that the groups of this program regularly publish articles in top international journals such as Science, Neuron, Developmental Cell, Genes and Development, Current Biology, Journal of Cell Biology, and PNAS. Each group within the RC has constantly international collaborations. The RC has been successful in obtaining research funding from competitive sources such as Academy of Finland, Sigrid Juselius Foundation, Finnish Cancer Foundation, Biocentrum Helsinki etc. Furthermore, the core facilities administered by this researcher community harbor several cutting edge technologies such as electron tomography, correlative light-electron microscopy, light microscopy analysis of protein dynamics in live cells, and interaction studies using fluorescence life-time imaging. Imaging core facilities provide services and collaboration nationwide and have active ongoing international collaborations.

Comments on how the RC's scientific productivity and doctoral training should be evaluated (MAX. 2200 characters with spaces): In the biosciences field, top quality science is typically published in the best international journals. Furthermore, the most important studies are typically highly cited. Thus, the best methods for assessing the quality of our research are to analyze the quality of the journals where the research was published and examine the number of citations to these articles.



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

RC-SPECIFIC STAGE 1 MATERIAL (registration form)

In assessing the quality of doctoral training, one should not only pay attention to the number of doctoral theses produced by the researcher community, but also pay attention to the quality of doctoral theses (using the same parameters as described above) and examine the time (years) spend for carrying out the thesis projects.

LIST OF RC MEMBERS

NAME OF THE RESEARCHER COMMUNITY:			CellMolBiol		
RC-LEADER			P. Lappalainen		
CATEGORY			1		
	Last name	First name	PI-status (TUHAT, 29.11.2010)	Title of research and teaching personnel	Affiliation
1	Lappalainen	Pekka	X	Research Director	Institute of Biotechnology
2	Jokitalo	Eija	X	University Researcher	Institute of Biotechnology
3	Hietakangas	Ville	X	University researcher	Institute of Biotechnology
4	Jantti	Jussi	X	University researcher	Institute of Biotechnology
5	Rivera	Claudio	X	University researcher	Institute of Biotechnology
6	Vartiainen	Maria	X	University researcher	Institute of Biotechnology
7	Ahola	Tero	X	Research Coordinator	Institute of Biotechnology
8	Puig	Oscar		University Researcher	Institute of Biotechnology
9	Savilahti	Harri		University Researcher	Institute of Biotechnology
10	Hellström	Kirsi		Postdoctoral Researcher	Institute of Biotechnology
11	Kaukinen	Pasi		Postdoctoral Researcher	Institute of Biotechnology
12	Neuvonen	Maarit		Doctoral candidate	Institute of Biotechnology
13	Kallio	Katri		Doctoral candidate	Institute of Biotechnology
14	Peränen	Johan		Senio Researcher	Institute of Biotechnology
15	Spuul	Pirjo		Doctoral candidate	Institute of Biotechnology
16	Balistreri	Giuseppe		Doctoral candidate	Institute of Biotechnology
17	Perttilä	Julia		Doctoral candidate	Institute of Biotechnology
18	Guo	Deyin		Senior Researcher	Institute of Biotechnology
19	Huet	Guillaume		Post doctoral researcher	Institute of Biotechnology
20	Dopie	Joseph		Doctoral candidate	Institute of Biotechnology
21	Skarp	Kari-Pekka		Doctoral candidate	Institute of Biotechnology
22	Rajakylä	Eeva		Doctoral candidate	Institute of Biotechnology
23	Tanhuanpää	Kimmo		Senior Researcher	Institute of Biotechnology
24	Pykäläinen	Anette		Doctoral candidate	Institute of Biotechnology
25	Vihinen	Helena		post doctoral researcher	Institute of Biotechnology
26	Puhka	Maija		doctoral candidate	Institute of Biotechnology
27	Joensuu	Merja		doctoral candidate	Institute of Biotechnology
28	Rämö	Olli		doctoral candidate	Institute of Biotechnology
29	Saarikangas	Juha		Doctoral candidate	Institute of Biotechnology
30	Mattila	Jaakko		Postdoctoral researcher	Institute of Biotechnology
31	Lind	Essi		Doctoral candidate	Institute of Biotechnology
32	Hasygar	Kiran		Doctoral candidate	Institute of Biotechnology
33	Teesalu	Mari		Doctoral candidate	Institute of Biotechnology
34	Makkonen	Maarit		Doctoral candidate	Institute of Biotechnology
35	Aro	Nina		Postdoctoral researcher	Institute of Biotechnology
36	Chernov	Konstantin		Postdoctoral researcher	Institute of Biotechnology
37	Jiu	Yaming		Postdoctoral researcher	Institute of Biotechnology
38	Pispa	Johanna		Postdoctoral researcher	Institute of Biotechnology
39	Zhao	Xueqiang		Postdoctoral researcher	Institute of Biotechnology
40	Weber	Marion		Doctoral candidate	Institute of Biotechnology
41	Yuan	Qiang		Doctoral candidate	Institute of Biotechnology
42	Gateva	Gergana		Doctoral candidate	Institute of Biotechnology
43	Zhao	Hongxia		Postdoctoral researcher	Institute of Biotechnology
44	Serlachius	Martina		Postdoctoral researcher	Institute of Biotechnology
45	Poukkula	Minna		Postdoctoral researcher	Institute of Biotechnology
46	Tojkander	Sari		Postdoctoral researcher	Institute of Biotechnology
47	Kremneva	Elena		Postdoctoral researcher	Institute of Biotechnology



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

RC-SPECIFIC STAGE 2 MATERIAL

BACKGROUND INFORMATION

Name of the RC's responsible person: Lappalainen, Pekka

E-mail of the RC's responsible person:

Name and acronym of the participating RC: Research Program in Cell and Molecular Biology, CellMolBiol

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 groups of the Research Program in Cell and Molecular Biology carry out top international level work to elucidate the basic principles of various fundamental cellular processes. These include e.g. cell morphogenesis, organelle transport and dynamics, and regulation of gene expression.

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).**

Research Program in Cell and Molecular Biology (CellMolBiol) is one of the four research programs of the Institute of Biotechnology (see: <http://www.biocenter.helsinki.fi/bi/research/index.html>). The research within the program focuses on basic principles of cell and organelle morphogenesis and dynamics, cell growth and metabolism, interactions of viruses with host cells as well as on the analysis of highly specialized mammalian cells such as neurons. The research groups use mammalian and yeast cells as well as the *C. elegans* nematode and fruit fly as model systems in the studies. The program also harbors two modern biological imaging centers: Light Microscopy Unit for advanced light microscopy studies on live cells and Electron Microscopy Unit, which both are national technology platforms for advanced biological imaging through Biocenter Finland organization.

The RC currently consists of seven research groups. In addition, two PIs who were members of the program (Oscar Puig and Harri Savilahti) were appointed to positions outside the institute during the years 2005-2010. The current research groups of the program and their main research questions are described below.

The actin cytoskeleton has a central role in a number of processes including cell morphogenesis, motility, and endocytosis. The laboratory of Pekka Lappalainen examines how the structure and dynamics of the actin cytoskeleton are regulated in these processes. During years 2005-2010 they have for example revealed how contractile actomyosin bundles are assembled in motile cells [Hotulainen and Lappalainen, *J. Cell Biol.*, (2006)] and determined the mechanism by which a conserved actin-binding protein twinfilin interacts with actin [Paavilainen et al., *PNAS*, (2007); Paavilainen et al., *J. Cell Biol.*, (2008)]. Furthermore, they discovered that actin-associated proteins IRSp53 and MIM directly deform PIP2-rich membranes through their I-BAR domains [Mattila et al., *J. Cell Biol.*, (2007); Saarikangas et al., *Curr. Biol.* (2009)], suggesting that formation of plasma membrane protrusions depends on the coordinated interplay between actin polymerization and direct membrane deformation by I-BAR domain proteins.

The replication of positive-strand RNA viruses takes place in membrane-associated structures in the infected cells. The laboratory of Tero Ahola aims to understand the structure, function and formation of



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

RC-SPECIFIC STAGE 2 MATERIAL

alphavirus replication complexes. They have shown that membrane association is essential for virus replication [Spuul et al., *J. Virol.* (2007)] and that the replication complexes undergo a large-scale endocytosis and transport from their site of formation at the inner surface of the plasma membrane to the outer surface of endo-lysosomes [Spuul et al., *J. Virol.* (2010)]. Together with Dr. Jokitalo they have devised methods to study the assembly of replication complexes by correlative light electron microscopy (CLEM). The laboratory has recently also discovered novel antiviral compounds, some of which appear to be membrane-active but non-toxic substances.

The laboratory of Ville Hietakangas is working on signaling and transcriptional regulatory mechanisms involved in nutrient sensing in animals. During postdoctoral training in the laboratory of Stephen Cohen (EMBL Heidelberg 2005-2007 and Singapore 2007-2009) Dr. Hietakangas addressed the function and downstream targets of the two functionally distinct complexes of the TOR kinase, which are involved in nutrient-mediated regulation of tissue growth [Hietakangas et al., *Genes Dev.* (2007); Teleman, Hietakangas et al., *Cell Metabolism* (2008)]. Hietakangas lab joined the RC in September 2009 and it is currently identifying and characterizing novel regulators of insulin secretion and mediators of insulin-regulated gene expression using genetic screens in *Drosophila*. They also examine transcriptional regulatory mechanisms involved in intracellular glucose sensing.

The endoplasmic reticulum (ER) is dynamic and complex organelle that hosts fundamental cellular functions such as the synthesis, modification and transport of secretory and membrane proteins and many lipids. The laboratory of Eija Jokitalo studies how ER network organization changes during cell division and what are the regulators of the ER morphology. They have showed that the ER undergoes dramatic morphological changes during cell division [(Puhka et al., *J. Cell Biol.*, (2007)] and that morphological variation of ER between different cell types and cell cycle changes correlates with the ribosomal density on these membranes (Puhka et al., submitted). They now study further the maintenance of sheet structures and their transformation into tubular network as well as examine the role of cytoskeleton in the maintenance and dynamics of the ER morphology.

Approximately one third of the genes in a eukaryotic cell encode proteins that function in the establishment or travel through the secretory pathway. This pathway is also needed for the compartmental organization of the cells. The laboratory of Jussi Jääntti studies the molecular mechanisms that control the transport of proteins through this pathway. During years 2005-2010 they have revealed novel interactions between the molecular machineries that reside at first step of the secretory pathway [Feng et al., *J. Biol. Chem.* (2007)] and identified a novel component Mso1p that functionally regulates the last step of the pathway [Knop et al., *Mol. Biol. Cell.* (2005)]. Furthermore, they have discovered a novel mode of regulation for the membrane fusion machinery during exocytosis [Weber et al., *Mol. Biol. Cell.* (2010)] and revealed the sequence of conserved molecular interactions that ensure correct docking and fusion of secretory vesicles to the plasma membrane [Weber-Boyvatt, et al., *Mol. Biol. Cell.* (2010)].

The focus of the laboratory of Claudio Rivera is to understand how cation-chloride cotransporters are involved in the maturation and plasticity of neuronal synapses during development and after pathophysiological conditions. During the last five years they have e.g. found that the K-Cl cotransporter KCC2 works as a synchronizing factor in the functional development of the nervous system [Li et al. *Neuron* 2007]. Changes in the efficacy of GABA_A transmission are known to be involved in the etiology of temporal lobe epilepsy. Rivera's group found that a subpopulation of human epileptic subicular neurons lack the expression of KCC2 rendering inhibitory GABA_A transmission less effective [Huberfeld et al., *J. Neurosci.* (2007)]. They have also disclosed a novel role of the interplay between chloride



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

RC-SPECIFIC STAGE 2 MATERIAL

homeostasis-GABAergic transmission with the functional role of the trophic factor BDNF on injured neurons [Shulga et al., J. Neurosci. (2008)].

Recent studies suggested that actin, better known as a component of the cytoskeleton, would have an important function in the cell nucleus as a transcriptional regulator. The laboratory of Maria Vartiainen studies the molecular mechanism by which actin functions during gene expression. Their work is based on the discovery that nuclear actin can regulate the activity of specific transcription factors [Vartiainen et al. Science (2007)], which was made by Dr. Vartiainen during her post doc in London. During 2007-2010 Vartiainen lab has, in collaboration with Dr. Treisman, elucidated how actin controls nuclear import of the transcriptional regulator MAL [Pawlovski et al. EMBO J. (2010)]. Recent key results from the Vartiainen lab include the dissection of the nuclear import mechanism for actin and identification of novel nuclear actin regulating proteins from genome-wide RNAi screening.

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

The most important mechanism to develop research within the RC is through recruitment of new research groups. This will be done through regular international calls for new group leaders by the Institute of Biotechnology. During years 2005-2010, two new groups, Ville Hietakangas and Maria Vartiainen (see above), were recruited to the RC.

To further strengthen the focus and to improve the quality of research within this community, it is also important increase collaboration between research groups within the RC and with other groups at the campus. For this purpose, the RC organizes joint seminar series, journal club, lecture/practical courses, and regular group leaders' meetings. It is also important to note that there is a significant number of joint publications between different laboratories of the RC, demonstrating that active collaboration is ongoing between the groups of the program.

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 research groups of the Program in Cell and Molecular Biology are actively involved in doctoral training. During years 2005-2011, total of 17 students from the laboratories of the RC defended their thesis, and there are currently 19 doctoral students working towards a PhD-degree in the seven research groups. Majority of the past and present doctoral students belong to graduate programs operating at the Viikki campus (VGSB: see <http://www.hbgs.helsinki.fi/Home.html> and GPBM: see <http://www.helsinki.fi/gpbm/>). The doctoral candidates are recruited to the graduate programs through international calls, and selection procedure in both programs includes rating of the applications by a selection committee and interviews of the candidates. Consequently, over 50 % of the present students in the RC are foreign.

The doctoral students carry out their projects in the research groups of the RC, and receive day-to-day basis supervision for their projects from the group leaders. To assure high quality training and PhD-thesis work, each doctoral student also has a 'PhD-thesis follow-up committee', which consists of the supervisor and two external scientists. The follow-up committee meets at least once every year to monitor the progress of the thesis project and to provide additional support/supervision to the thesis project. In addition, the doctoral students receive formal education through lecture and practical



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

RC-SPECIFIC STAGE 2 MATERIAL

courses organized by the graduate programs (see below), and are encouraged to participate to international courses (e.g. EMBO, FEBS and Cold Spring Harbor courses) that are related to their thesis projects.

The director of the Research Program in Cell and Molecular Biology (Pekka Lappalainen) is the head of the one of the largest graduate programs at University of Helsinki. The Helsinki Graduate Program in Biotechnology and Molecular Biology (GPBM) is an international Ph.D. training program administered by the Biocentrum Helsinki organization and the Institute of Biotechnology, University of Helsinki. The program has currently 50 students supported by the Ministry of Education and Culture. It organizes a large number of practical and theoretical courses for doctoral students, and supports their thesis projects/studies through travel funds and formal thesis committee work. In addition, a member of the RC (Eija Jokitalo) serves in the board of the Viikki Doctoral Program in Molecular Biosciences (VGSB), representing the field of cell biology. All research groups within the Research Program in Cell and Molecular Biology actively organize courses to the GPBM and VGSB graduate programs as well as other graduate programs operating at University of Helsinki. Thus, in addition to training doctoral students in their own laboratories, the senior scientists of this researcher community actively participate in training other doctoral students at our university through organizing courses to graduate programs and participating in the administration of graduate programs.

To support scientific training at all levels, the Viikki campus houses a weekly Monday Lecture series with top-quality international and national speakers (http://www.biocenter.helsinki.fi/viikki_lectures.html). This series is coordinated by members of the RC, Jussi Jäntti (2006 - 2009) and Ville Hietakangas (2010 -).

The main practices for quality assurance in doctoral training include the external 'PhD-thesis follow-up committees' that each student has, and high quality formal education received through graduate programs. The GPBM and VGSB graduate programs offer courses on wide range of biological topics, bio-business, and science ethics to ensure that the students will gain good general knowledge on molecular biology as well as other skills/knowledge that will be important when they will continue in academic research, biotech industry or in teaching/administration positions. This wide training will also increase the flexibility of the students to adapt to various different jobs during their professional careers. From the 17 doctoral students who graduated from the RC during years 2005-2011, 6 continued in academic research abroad, 8 continued in academic research in Finland, 2 continued in biotech industry abroad, and 1 in biotech industry in Finland.

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

The obvious strengths of the RC related to doctoral training are the high quality of research carried out in the laboratories, 'medium' size of the research groups (currently 4-8 PhD-students/post-docs per research group) and wide methodological expertise within the program. Our RC also organizes regular journal club and seminar series for the students that increase the awareness of the doctoral students (and other staff of the RC) of the science carried out in other research groups as well as improve the presentation skills of the students.

The main challenge for doctoral training within this RC (and in all research institutes in Finland) is the recruitment of good doctoral students. For this purpose, the members of the RC are involved in identifying and recruiting good doctoral candidates from abroad. Ville Hietakangas has connections to many Asian countries through his post-doctoral training in Singapore, and the GPBM graduate school led



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

RC-SPECIFIC STAGE 2 MATERIAL

by Pekka Lappalainen has established a 'summer school' activity with Wuhan University, China to recruit talented students to Finland.

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).

The societal impact of the RC is built from the individual activities of the RC members. These include memberships in several committees and organizations, reviewing duties for scientific journals and funding organizations, organizing meetings and courses, housing international visitors and expert tasks around doctoral dissertations and academic promotions.

In promoting the public awareness of the research fields, members of the RC have given interviews for written media, radio and TV as well as organized laboratory visits to high school and polytechnic school students. For example, Maria Vartiainen was interviewed for the 'Tieteen näkökulma' webpage by University of Helsinki 2010, for the webpage 'Tietysti.fi' about research careers (2009) and for radio program in YLE about Nobel prize for the discovery of GFP (2008). She was a speaker at Studia-fair, invited by the Academy of Finland, on 'Careers in science' (2009) and gave a lecture on career development in science in Science Fair of Helsinki graduate schools (2008). Claudio Rivera was interviewed for Helsinki University Bulletin (HUB) 'Claudio Rivera's research group discovered how the development of nerve connections is synchronised. But who is Rivera?' (2007) and his group wrote an article on this topic to Finnish medical association journal, *Duodecim* (2008). Mervi Lindman from the Jokitalo group participated to a TV program in YLE about the salvage techniques and preservation methods of the shipwreck *Vrouw Maria* (2008). Ville Hietakangas was an advisor in science competition for high school students organized by the Academy of Finland (*Viksu tiedekilpailu*, 2010).

Eija Jokitalo has hosted each year short (2-4 hours long) laboratory visits for 1-2 groups from polytechnic schools, and 5-8 groups from high school in the capital area. These visits usually consist of a short introduction to the EM techniques and operation of microscopes, and demonstrations on imaging with transmission and scanning EM. Finally, Jussi Jäntti was a member of the Helsinki University Hospital Coordinating Ethical committee specializing in biotechnological issues and chair of the Viikki Research Group organization, University of Helsinki, 2008-2010.

During 2005-2010 the members of the RC were reviewers for 29 doctoral thesis and opponents for 6 dissertations at the domestic universities of Helsinki, Jyväskylä, Turku, Oulu, Kuopio, Åbo Academi, and abroad in Norway, Denmark, France and Australia, and served as reviewers for adjunct professorships and other academic promotions. Members have active roles in various graduate schools: Pekka Lappalainen is the director of GPBM graduate program, Eija Jokitalo is a member of the board of VGSB graduate program. The members of the RC have been involved in reviewing 20 funding calls from 13 different funding organizations mainly outside Finland (e.g. UK, Netherlands, Belgium, Czech Republic, USA and Singapore), and reviewing scientific articles for 52 different international journals (including high impact journals such as *Nature*, *Science*, *Nature Cell biology*, *Nature Structural and Molecular Biology*, *JCB*, *EMBO J.* etc.). Furthermore, Pekka Lappalainen is an executive editor of *Journal Cytoskeleton* and Tero Ahola is an associate editor of *BMC Microbiology*.

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

The individual teams of the RC are carrying out top international quality research on central biological questions. To further strengthen the societal impact of the research, the individual scientists will be encouraged to be more active in communicating their findings to public as well as searching for



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

RC-SPECIFIC STAGE 2 MATERIAL

potential applications from their research. The latter can be achieved through regular discussions between leaders of the individual research groups as well as with companies that focus on identifying possible applications from basic research. Furthermore, the two important core facilities (Electron Microscopy and Light Microscopy Units) led by the members of the RC will strengthen their links to private companies in Finland and abroad.

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.

Research in the RC program is not centered around one research theme, but instead the teams pursue their independent research lines. However, there is a strong emphasis for collaboration when it is beneficial. The common research interests that have resulted in collaborations within the program include analysis of cytoskeleton-membrane interactions (Lappalainen-Rivera, Lappalainen-Jokitalo), endomembrane dynamics (Lappalainen-Jäntti, Lappalainen-Ahola, Jäntti-Jokitalo), the role of actin in transcriptional regulation (Vartiainen-Jokitalo), and the role of membranes in virus replication (Ahola-Jokitalo). Methodologically oriented collaborations within the RC include e.g. the use of transposon mutagenesis as a tool to probe protein functions (Jäntti-Savilahti) and the use of electron tomography in membrane analysis (Jokitalo-Lappalainen, Jokitalo-Ahola). The research program harbors two core facilities, Electron microscopy and the light microscopy units, which technologically interlink broadly the ongoing work of the research groups.

The collaborations within the research program have led to several high impact publications including: Poussu et al., *Nucl. Acid. Res.* (2005) [Jäntti-Savilahti], Mattila et al., *J. Cell Biol.* (2007) [Lappalainen – Jokitalo], Spuul et al., *J. Virol.* (2007) [Ahola-Jokitalo], Li et al., *Neuron* (2007) [Rivera-Light Microscopy Unit], Hotulainen et al., *J. Cell Biol.* (2009) [Lappalainen-Rivera-Light Microscopy Unit] and Weber et al., *Mol. Biol. Cell* (2010) [Savilahti-Jäntti]. In addition, there is a large body of ongoing collaborative work.

All research groups of the RC have active interactional collaborations that have led to several high impact publications during years 2005-2010. These include e.g. Chereau et al., *Science* (2008) [collaboration of Lappalainen lab with R. Dominguez lab at Univ. Pennsylvania, USA], Gandhi et al., *Curr. Biol.*, (2010) [Lappalainen lab with B. Goode lab at Brandeis Univ., USA], Helfer et al., *EMBO J.* (2006) [Lappalainen lab with M-F. Carlier at CNRS, France], Pawlowski et al. *EMBO J.* (2010) [Vartiainen lab with R. Treiman at CRUK, UK], Chen et al., *PNAS* (2009) [Ahola lab with D. Guo lab at Wuhan Univ., China], Uchiyama et al., *Dev. Cell* (2006) [Jokitalo lab with H. Kondo at MITILS, Japan].

The collaborations with the RC also involve mobility of PhD-students and post-docs. The researchers within the RC are encouraged to participate in international congresses (typically 1/year) and in practical courses as well as to make short term visits to laboratories abroad to learn new techniques. For example, Joseph Dopie from the Vartiainen-lab visited Drosophila RNAi screening center at Harvard, Boston for four months in 2009 to perform a genome-wide screen to search for novel nuclear actin regulating proteins and Ville Paavilainen from Lappalainen-lab visited CNRS France for one month in year 2006 to carry out in vitro actin-based motility assays in the laboratory of prof. Marie-France Carlier. The groups in the RC have hosted 13 visits for students and post-docs from laboratories abroad laboratories (for example the Lappalainen laboratory has had EMBO Short-term fellows from Spain, Italy and Hungary to carry out experiments during this period).



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

RC-SPECIFIC STAGE 2 MATERIAL

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

The RC is a strong proponent of researcher mobility and this has encouraged several of the students to carry out a post-doctoral period abroad (6 of the students graduated during years 2005-2010 have gone abroad to carry out their postdoc research). All PI's of the RC have spent a longer research period abroad and the groups have attracted a large number of graduate students and post-docs from abroad (currently 10/19 of the PhD students are foreign).

Within the RC there are strong topical and technological themes that have already resulted in extensive collaboration between the research groups (see above). With the recent recruitment of two new groups with research themes that fit well with the existing groups, it is expected that the number of collaborations will increase in the future. Also the high quality imaging platforms within the RC form a solid ground for collaborations. Thus, there are no obvious challenges for research collaboration within the RC.

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).

In cell and molecular biology, cutting edge research is increasingly dependent on technologies and services provided by core facilities. In the University of Helsinki, both Institute of Biotechnology and Biocentrum Helsinki have established and continued to support a number of such facilities. Biological imaging methods are of prime importance for this RC, and two imaging units are affiliated with this RC (see below). Researchers within the RC actively participate in establishing and developing new methods, which the imaging units can subsequently offer to other users. Core facilities important for the RC also include protein analysis (proteomics), protein structural study facilities by crystallization and NMR, bioinformatics, DNA sequencing (including transcriptomics), and transgenic mouse facilities.

The Light Microscopy Unit (LMU) and the Electron Microscopy (EM) Unit, affiliated with this RC, function as central core facilities, serving researchers at the University of Helsinki, as well as other academic and commercial users. Staff of the units provides training, consultation, support and equipment management services. Some larger projects, for example setting up new imaging and analysis methods, are done as scientific collaboration, while most are on the basis of access to instruments and paid services. The units are funded by Biocenter Finland, Biocentrum Helsinki, Institute of Biotechnology, Academy of Finland and user fees. LMU aims to be a facility for high-end data acquisition with a wide range of supported applications, and to keep pace with developing imaging technologies. The available instruments include a multiphoton microscope with lifetime imaging and fluorescence correlation spectroscopy, two ordinary and one high content confocal microscope, a TILL imaging system, two Cell-IQ continuous cell culturing platforms and three image analysis workstations. Data back-up and cell culture facilities are also provided. In 2005-2010 LMU facilities were used in 68 publications; out of these, 23 contained authors affiliated to the Research Program in Cell and Molecular Biology, highlighting the importance of LMU to the research needs of this RC.

The EM unit has annually 50-60 projects from bio-, medical and material sciences. It is active in setting up advanced EM techniques such as electron tomography, correlative light electron microscopy, high pressure freezing and freeze substitution. New nationwide services for biological 3D imaging will soon be provided by improving the current electron tomography services and by establishing a new method based on serial block face imaging on scanning electron microscopy. Currently instruments include three



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

RC-SPECIFIC STAGE 2 MATERIAL

transmission and one scanning electron microscopes, all equipped with CCD-cameras, and element analysis can be done on one TEM. For specimen preparation the unit has three ultramicrotomes one of which is equipped for cryosectioning, and devices for critical point drying, platinum and carbon coating and glow discharge. For cryopreparation there is a high pressure freezing device, freeze substitution units and a vitrification robot. In 2005-2010 EM unit services were used in over 80 publications.

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

As technologies in all these areas continue to advance rapidly, it is crucial for the RC, and the entire bioscience community in the university that both national and university level support for the core facilities remains at a high level. In addition to new and upgraded equipment, specialized technicians and scientists with methodological interests are required to maintain and enhance the level of the core facilities. Increasing the use of high-throughput analysis technologies and screening methods represents an important challenge and opportunity for the RC's research that needs to be tackled in collaboration with the core facilities.

The PIs of the RC have significant teaching, administrative and core facility leader roles that consume a large portion of their time. However, these roles can also be seen as supportive to the research of the RC, providing access to students and collaborative networks, as well as a close understanding of the methodologies provided by core facilities. On a whole, the research and other duties within this RC are in a reasonable balance.

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 RC is composed of scientifically independent research groups. The leadership and management in the RC are therefore non-hierarchical. However, the director of the RC (Pekka Lappalainen) is responsible for supervising the new group leaders of the RC with grant applications, hiring of PhD-students and post-docs as well as in setting their laboratories at the Institute of Biotechnology. All individual research groups in the RC have a simple management structure. Individual groups form a medium-sized units carrying out research on well-focused topics. They are all managed by one PI, i.e. none of the groups has an umbrella-structure with sub-projects managed by junior PIs. This simple structure ensures that the research groups remain cohesive and effective with a good input-output ratio.

The high quality of the research in the RC is ensured through regular international evaluations of research groups at the Institute of Biotechnology by an external scientific advisory board (see: <http://www.biocenter.helsinki.fi/bi/about/sab.html>). The research of each group is evaluated once in every four years. Groups unsuccessful in the evaluation can be discontinued or move elsewhere within a suitable transition period. However, it is actually more common that highly successful group leaders are recruited to permanent positions, e.g. full professorships in universities. Good examples of this are Oscar Puig and Harri Savilahti from this RC, who were recruited to a lucrative position in the pharmaceutical industry at United States and appointed to a full professor at University of Turku, respectively. It is also important to note that the research director of the RC is closely involved in the



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

RC-SPECIFIC STAGE 2 MATERIAL

process of recruitment of new research groups to the Institute of Biotechnology, thus ensuring scientific excellence of new groups to be recruited.

In collaboration with the group leaders in the RC, the research director coordinates common activities for all members of the RC, such as a seminar series and a journal club, which are aimed to increase exchange of ideas within the RC and promote collaboration between the groups. In addition, the group leaders of the RC gather regularly to 'chalk-talks', which are highly informal seminars where each group leader present their future research plans and challenges. Also these events increase the cohesiveness of the RC and foster collaborative projects with the RC.

Because the RC is responsible for two major core facilities (see section 5) the group leaders of the RC are responsible in planning and coordinating the development and maintenance of the core facilities. Maria Vartiainen is responsible for the Light Microscopy unit and Eija Jokitalo for the Electron Microscopy unit.

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

The obvious strengths of the RC related to leadership and management are the high flexibility and non-hierarchical structure. Individual research groups are regularly evaluated and the unsuccessful groups can be terminated. On the other hand, new promising research groups will be hired through regular open international calls. The main challenges concerning management are to identify the most promising candidates for new group leader positions, and to ensure that they will receive competitive start-up packages to build successful independent research groups.

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: 4715246
- 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: 143000
- 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: 236000
- 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
- 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 Juselius Foundation, Finnish Cancer Foundation, Finnish Heart Foundation, University of Helsinki Research Grants
 - total amount of funding (in euros) from the above-mentioned foundations: 1443629



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

RC-SPECIFIC STAGE 2 MATERIAL

- 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:
 - total amount of funding (in euros) from the above-mentioned funding organizations: 0
- 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, Ministry of Education and Culture doctoral positions
 - total amount of funding (in euros) from the above-mentioned funding organizations: 1385276

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.

The scientific excellence in this RC is maintained through regular evaluations of the individual research groups by an external, international scientific advisory board (SAB) of the Institute of Biotechnology. In 2011, Pekka Lappalainen and Maria Vartiainen will be evaluated, whereas Ville Hietakangas and Eija Jokitalo will be evaluated in 2013. The evaluation report will form an important basis for the individual groups to assess the relevance of their research questions and the approaches used to address them. This will also allow strengthening of the existing collaborations among the research groups and formation of new ones, depending on the scientific needs of individual groups.

The most important mechanism to develop research within the RC is through recruitment of new research groups. For example, one new group (Päivi Ojala lab) will join the RC during the year 2011. Regular international calls for new group leaders by the Institute of Biotechnology will be used to further strengthen the RC's research profile in the future.

In 2011-2013 competitive national funding will still form an important basis for this RC. However, because majority of research funding for the RC during the years 2005-2010 was obtained from national sources, the RC also aims to focus more on international funding opportunities in the future. For example, Maria Vartiainen is coordinating a project grant application for Human Frontier Science Program in 2011, and both Maria Vartiainen and Ville Hietakangas have applied for the ERC Starting grant, with results expected in 2011.

It will also be highly significant to maintain and develop the core facilities, which are associated with the RC. Besides being absolutely essential for the research projects of this RC, the EM unit and LMU serve a large user community both in Helsinki and also nationally. During 2011 a TIRF microscope and one more image analysis workstations will be acquired for LMU and infrastructure for high content image storage and analysis will be developed. The emphasis at the EM unit will be in developing further the 3D imaging and image analysis. The installation of a new SEM equipped for automated serial section imaging started in December 2010. After training the personnel of the unit and establishing suitable specimen preparation methods, the unit will start a collaborative project utilizing this technique. The development of image analysis techniques will serve both electron tomography and serial section imaging projects. Both core facilities received funding from the Biocenter Finland (BF) for 2010-2012, and an interim, international evaluation of the technology platforms will take place in August 2011. BF Scientific Advisory Board also evaluates new proposals for technology platforms and emerging technologies,



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

RC-SPECIFIC STAGE 2 MATERIAL

where this RC could act to establish new infrastructures for its research needs. In addition to BF funding, both core facilities will also actively participate in international infrastructure calls, such as Euro-BioImaging (ESFRI), either through BF Biological imaging network or through Helsinki Functional Imaging Center (HFIC).

High quality research performed in the research groups will form the basis for successful doctoral training also in the future. During 2011-2013, this RC expects 12 students to obtain their PhD degrees. The main challenge for doctoral training within this RC is the recruitment of good doctoral students. For this purpose, the members of the RC are involved in identifying and recruiting good doctoral candidates from abroad (see section 2).

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

The principal investigators organized a meeting, where possible contents of each section of the evaluation report were discussed in detail. Each PI then took a responsibility for preparing the first drafts of 1-2 sections of the evaluation report, which were compiled to a single file. Each PI sent their comments/suggestions to Pekka Lappalainen, who prepared the final version of the evaluation report.



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

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

CellMolBiol/Lappalainen

1 Analysis of publications

- Associated person is one of Pekka Lappalainen , Eija Jokitalo , Ville Hietakangas ,
Jussi Jääntti , Claudio Rivera Baeza , Maria Vartiainen ,
Tero Ahola , Oscar Puig, Harri Savilahti, Kirsi Hellström , Pasi Kaukinen , Katri Maarit
Neuvonen , Elisa Kallio , Johan Peränen , Pirjo Spuul , Joseph Bayor Dopie ,
Giuseppe Balistreri , Julia Perttilä , Guillaume Huet , Kimmo Tanhuanpää ,
Kari-Pekka Ferdinand Skarp , Eeva Rajakylä , Helena Vihinen , Maija Kaarina Puhka ,
Anette Maaria Pykäläinen ,
Merja Susanna Joensuu , Olli Rämö , Juha Saarikangas ,
Jaakko Mattila , Essi Lind , Kiran Hasygar , Mari Teesalu , Maarit
Hannele Makkonen , Nina Kaarina Aro , Konstantin Chernov , Yaming Ju ,
Johanna Maria Pispä , Xueqiang Zhao, Marion Weber , Qiang Yuan ,
Gergana Gateva , Hongxia Zhao , Eva Martina Serlachius ,
Minna Poukkula , Sari Susanna Tojkander , Elena Kremneva ,

Publication type	Publication Year						Total Count 2005 - 2010
	2005	2006	2007	2008	2009	2010	
A1 Refereed journal article	27	22	28	31	34	23	165
A2 Review in scientific journal	6	2		1	1		10
A3 Contribution to book/other compilations (refereed)					1		1
B1 Unrefereed journal article	1		1	1			3
B2 Contribution to book/other compilations (non-refereed)			1				1
D1 Article in professional journal				1	1		2
D2 Article in professional hand or guide book or in a professional data system, or text book material						1	1



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

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

CellMolBiol/Lappalainen

2 Listing of publications

A1 Refereed journal article

2005

- Davydenko, SG, Feng, D, Jääntti, J, Keränen, S **2005**, 'Characterization of GPI 14/YJR013w mutation that induces the cell wall integrity signalling pathway and results in increased protein production in *Saccharomyces cerevisiae*', **Yeast**, vol 22, pp. 993-1009.
- Hotulainen, P, Paunola, E, Vartiainen, MK, Lappalainen, P **2005**, 'Actin-depolymerizing factor and cofilin-1 play overlapping roles in promoting rapid F-actin depolymerization in mammalian nonmuscle cells', **Molecular Biology of the Cell**, vol 16, pp. 649-664.
- Hynynen, R, Laitinen, S, Käkälä, R, Tanhuanpää, K, Lusa, S, Ehnholm, C, Somerharju, P, Ikonen, E, Olkkonen, VM **2005**, 'Overexpression of OSBP-related protein 2 (ORP2) induces changes in cellular cholesterol metabolism and enhances endocytosis', **Biochemical Journal**, vol 390, pp. 273-283.
- Hölttä-Vuori, M, Alpy, F, Tanhuanpää, K, Jokitalo, E, Mutka, A, Ikonen, E **2005**, 'MLN64 is involved in actin-mediated dynamics of late endocytic organelles', **Molecular Biology of the Cell**, vol 16, pp. 3873-3886.
- Johansson, M, Lehto, M, Tanhuanpää, K, Cover, TL, Olkkonen, VM **2005**, 'The oxysterol-binding protein homologue ORP1L interacts with Rab7 and alters functional properties of late endocytic compartments', **Molecular Biology of the Cell**, vol 16, pp. 5480-5492.
- Jukkola, T, Trokovic, R, Maj, P, Lamberg, A, Mankoo, B, Pachnis, V, Savilahti, H, Partanen, J **2005**, 'Meox1^[sup Cre]: a mouse line expressing Cre recombinase in somitic mesoderm', **Genesis: The Journal of Genetics and Development**, vol 43, no. 3, pp. 148-153.
- Karhinen, L, Nunes Bastos, R, Jokitalo, E, Makarow, M **2005**, 'Endoplasmic reticulum exit of a secretory glycoprotein in the absence of Sec24p family proteins in yeast', **Traffic**, vol 5, no. 7, pp. 562-574.
- Khirug, S, Huttu, K, Ludwig, A, Smirnov, S, Voipio, J, Rivera, C, Kaila, K, Khiroug, L **2005**, 'Distinct properties of functional KCC2 expression in immature mouse hippocampal neurons in culture and in acute slices', **European Journal of Neuroscience**, vol 21, pp. 899-904.
- Kiljunen, S, Vilen, H, Pajunen, M, Savilahti, H, Skurnik, M **2005**, 'Nonessential genes of phage [phi]YeO3-12 include genes involved in adaption to growth on *Yersinia enterocolitica* serotype O:3', **Journal of Bacteriology**, vol 187, no. 4, pp. 1405-1414.
- Knop, M, Miller, KJ, Mazza, M, Feng, D, Weber, M, Keränen, S, Jääntti, J **2005**, 'Molecular interactions position Mso1p, a novel PTB domain homologue, in the interface of the exocyst complex and the exocytic SNARE machinery in yeast', **Molecular Biology of the Cell**, vol 16, pp. 4543-4556.
- Käkälä, R, Tanhuanpää, K, Laitinen, S, Somerharju, P, Olkkonen, V **2005**, 'Overexpression of OSBP-related protein 2 (ORP2) in CHO cells induces alterations of phospholipid species composition', **Biochemistry and Cell Biology**, vol 83, pp. 677-683.
- Laasik, E, Ojarand, M, Pajunen, M, Savilahti, H, Mäe, A **2005**, 'Novel mutants of *Erwinia carotovora* subsp. *carotovora* defective in the production of plant cell wall degrading enzymes generated by Mu transpososome-mediated insertion mutagenesis', **FEMS Microbiology Letters**, vol 243, pp. 93-99.
- Metso, AJ, Zhao, H, Tuunainen, I, Kinnunen, P, Metso, A, Zhao, H **2005**, 'Observation of the main phase transition of dinervonylphosphocholine giant liposomes by fluorescence microscopy', **Biochimica et Biophysica Acta. Biomembranes**, vol 1713, pp. 83-91.
- Nandelstadh von, P, Grönholm, M, Moza, M, Lamberg, A, Savilahti, H, Carpen, O **2005**, 'Actin-organising properties of the muscular dystrophy protein myotilin', **Experimental Cell Research**, vol 310, no. 1, pp. 131-139.
- Pajunen, M, Pulliainen, AT, Finne, J, Savilahti, H **2005**, 'Generation of transposon insertion mutant libraries for Gram-positive bacteria by electroporation of phage Mu DNA transposition complexes', **Microbiology-SGM**, vol 151, pp. 1209-1218.
- Pajusto, M, Toivonen, TH, Tarkkanen, J, Jokitalo, E, Mattila, PS **2005**, 'Reactive oxygen species induce signals that lead to apoptotic DNA degradation in primary CD4+ T cells', **Apoptosis**, vol 10, no. 6, pp. 1433-1443.
- Pakkanen, J, Jokitalo, E, Tuominen, RK **2005**, 'Up-regulation of $\beta 2$ and 7 subunit containing nicotinic acetylcholine receptors in mouse striatum at cellular level', **European Journal of Neuroscience**, vol 21, no. 10, pp. 2681-91.
- Miinea CP, Sano H, Kane S, Sano E, Fukuda M, Peränen J, Lane WS, Lienhard GE. **2005**, 'AS160, the Akt substrate regulating GLUT4 translocation, has a functional Rab GTPase-activating protein domain.', **Biochemical Journal**, vol 2005, no. 391, pp. 87-93.
- Peränen, J, Hattula, AK **2005**, 'Purification and functional properties of a Rab8-specific GEF (Rabin3) in action remodeling and polarized transport.', **Methods in Enzymology**, vol 2005, no. 403, pp. 284-295.
- Poukkula, M, Kaunisto, A, Hietakangas, V, Denessiouk, K, Katajamaki, T, Johnson, MS, Sistonen, L, Eriksson, JE **2005**, 'Rapid turnover of c-FLIP short is determined by its unique C-terminal tail', **Journal of Biological Chemistry**, vol 280, pp. 27345-27355.



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

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

CellMolBiol/Lappalainen

Poussu, E, Jääntti, J, Savilahti, H **2005**, 'A gene truncation strategy generating N- and C-terminal deletion variants of proteins for functional studies: mapping of the Sec1p binding domain in yeast Mso1p by a Mu in vitro transposition-based approach', **Nucleic Acids Research**, vol 33, no. 12, pp. e104.

Saariaho, A, Lamberg, A, Elo, S, Savilahti, H **2005**, 'Functional comparison of the transposition core machineries of phage Mu and Haemophilus influenzae Mu-like prophage Hin-Mu reveals interchangeable components', **Virology**, vol 331, pp. 6-19.

Törnberg, J, Voikar, V, Savilahti, H, Rauvala, H, Airaksinen, MS **2005**, 'Behavioural phenotypes of hypomorphic KCC2-deficient mice', **European Journal of Neuroscience**, vol 21, pp. 1327-1337.

Vainio, S, Bykov, I, Hermansson, M, Jokitalo, E, Somerharju, P, Ikonen, E **2005**, 'Defective insulin receptor activation and altered lipid rafts in Niemann-Pick type C disease hepatocytes', **Biochemical Journal**, vol 391, pp. 465-472.

Vanhatalo, S, Palva, JM, Andersson, S, Rivera, C, Voipio, J, Kaila, K **2005**, 'Slow endogenous activity transients and developmental expression of K⁺-Cl⁻ cotransporter 2 in the immature human cortex', **European Journal of Neuroscience**, vol 22, no. 11, pp. 2799-2804.

Vullo, D, Voipio, J, Innocenti, A, Rivera Baeza, C, Ranki, H, Scozzafava, A, Kaila, K, Supuran, CT **2005**, 'Carbonic anhydrase inhibitors: inhibition of the human cytosolic isozyme VII with aromatic and heterocyclic sulfonamides', **Bioorganic & Medicinal Chemistry Letters**, vol 15, pp. 971-976.

Zhao, H, Jutila, A, Nurminen, T, Wickström, SA, Keski-Oja, J, Kinnunen, P **2005**, 'Binding of endostatin to phosphatidylserine-containing membranes and formation of amyloid-like fibers', **Biochemistry**, vol 44, pp. 2857-2863.

2006

Bugyi, B, Papp, G, Hild, G, Lorinczy, D, Nevalainen, EM, Lappalainen, P, Somogyi, B, Nyitrai, M **2006**, 'Formins regulate actin filament flexibility through long range allosteric interactions', **Journal of Biological Chemistry**, vol 281, no. 16, pp. 10727-10736.

Cai, C, Li, H, Rivera Baeza, C, Keinänen, K **2006**, 'Interaction between SAP97 and PSD-95, two Maguk proteins involved in synaptic trafficking of AMPA receptors', **Journal of Biological Chemistry**, vol 281, no. 7, pp. 4267-4273.

Egloff, M, Malet, H, Putics, A, Heinonen, M, Dutartre, H, Frangeul, A, Gruez, A, Campanacci, V, Cambillau, C, Ziebuhr, J, Ahola, T, Canard, B **2006**, 'Structural and functional basis for ADP-ribose and poly(ADP-Ribose) binding by viral macro domains', **Journal of Virology**, vol 80, no. 17, pp. 8493-8502.

Hattula, K, Furuholm, J, Tikkanen, J, Tanhuanpää, K, Laakkonen, PM, Peränen, J **2006**, 'Characterization of the Rab8-specific membrane traffic route linked to protrusion formation', **Journal of Cell Science**, vol 119, pp. 4866-4877.

Helfer, E, Nevalainen, EM, Naumanen, P, Romero, S, Didry, D, Pantaloni, D, Lappalainen, P, Carlier, M **2006**, 'Mammalian twinfilin sequesters ADP-G-actin and caps filament barbed ends: implications in motility', **EMBO Journal**, vol 25, pp. 1184-1195.

Hellman, M, Paavilainen, VO, Annala, A, Lappalainen, P, Permi, P **2006**, 'NMR assignment of the C-terminal ADF-H domain of an actin monomer binding protein, twinfilin', **Journal of Biomolecular NMR**, vol 36, no. 5, pp. 66.

Hietakangas, V, Anckar, J, Blomster, H, Fujimoto, M, Palvimo, J, Nakai, A, Sistonen, L **2006**, 'PDSM, a motif for phosphorylation-dependent SUMO modification', **Proceedings of the National Academy of Sciences of the United States of America**, vol 103, no. 1, pp. 45-50.

Hotulainen, P, Lappalainen, P **2006**, 'Stress fibers are generated by two distinct actin assembly mechanisms in motile cells', **Journal of Cell Biology**, vol 173, no. 3, pp. 383-394.

Kervinen, M, Hinttala, R, Helander, H, Kurki, SS, Uusimaa, J, Finel, M, Majamaa, K, Hassinen, I **2006**, 'The MELAS mutations 3946 and 3949 perturb the critical structure in a conserved loop of the ND1 subunit of mitochondrial complex I', **Human Molecular Genetics**, vol 15, no. 17, pp. 2543-2552.

Kokko, A, Ylisaukko-oja, S, Kiuru, M, Takatalo, M, Salmikangas, P, Tuimala, J, Arango, D, Karhu, A, Aaltonen, LA, Jääntti, J **2006**, 'Modeling tumor predisposing FH mutations in yeast: effects on fumarase activity, growth phenotype and gene expression profile', **International Journal of Cancer**, vol 118, no. 6, pp. 1340-1345.

Krupovic, M, Vilen, H, Bamford, J, Kivelä, HM, Aalto, J, Savilahti, H, Bamford, DH **2006**, 'Genome characterization of lipid-containing marine bacteriophage PM2 by transposon insertion mutagenesis', **Journal of Virology**, vol 80, no. 18, pp. 9270-9278.

Lulla, V, Merits, A, Sarin, P, Kääriäinen, L, Keränen, S, Ahola, T **2006**, 'Identification of mutations causing temperature-sensitive defects in Semliki forest virus RNA synthesis', **Journal of Virology**, vol 80, no. 6, pp. 3108-3111.

Lulla, A, Lulla, V, Tints, K, Ahola, T, Merits, A **2006**, 'Molecular determinants of substrate specificity for Semliki forest virus nonstructural protease', **Journal of Virology**, vol 80, no. 11, pp. 5413-5422.

Pakkanen, JS, Stenfors, J, Jokitalo, E, Tuominen, RK **2006**, 'Effect of chronic nicotine treatment on localization of neuronal nicotinic acetylcholine receptors at cellular level', **Synapse (New York)**, vol 59, no. 7, pp. 383-393.

Saariaho, A, Savilahti, H **2006**, 'Characteristics of MuA transposase-catalyzed processing of model transposon end DNA hairpin substrates', **Nucleic Acids Research**, vol 34, no. 10, pp. 3139-3149.



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

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

CellMolBiol/Lappalainen

- Schuchmann, S, Schmitz, D, Rivera, C, Vanhatalo, S, Salmen, B, Mackie, K, Sipila, ST, Voipio, J, Kaila, K **2006**, 'Experimental febrile seizures are precipitated by a hyperthermia-induced respiratory alkalosis', **Nature Medicine**, vol 12, no. 7, pp. 817-823.
- Serlachius, M, Zhang, K, Andersson, LC **2006**, 'Stanniocalcin in terminally differentiated mammalian cells', **Peptides**, vol 25, no. 10, pp. 1657-1662.
- Syrjäkoski, K, Jääntti, J, Kallioniemi, A, Karhu, R **2006**, 'Mutations in the BRCA2 interacting DSS1 are not a risk factor for male breast cancer', **International Journal of Cancer**, vol 120, pp. 444-446.
- Tulamo, R, Frösen, J, Junnikkala, S, Paetau, A, Pitkaniemi, J, Kangasniemi, M, Niemelä, M, Jääskeläinen, J, Jokitalo, E, Karatas, A, Hernesniemi, J, Meri, S **2006**, 'Complement activation associates with saccular cerebral artery aneurysm wall degeneration and rupture', **Neurosurgery (Baltimore)**, vol 59, no. 5, pp. 1069-1077.
- Uchiyama, K, Totsukawa, G, Puhka, M, Kaneko, Y, Jokitalo, E, Dreveny, I, Beuron, F, Zhang, X, Freemont, P, Kondo, H **2006**, 'p37 Is a p97 adaptor required for golgi and ER biogenesis in interphase and at the end of mitosis', **Developmental Cell**, vol 11, pp. 803-816.
- Uvarov, P, Ludwig, A, Markkanen, M, Rivera, C, Airaksinen, MS **2006**, 'Upregulation of the neuron-specific K+/Cl- cotransporter expression by transcription factor early growth response 4', **Journal of Neuroscience**, vol 26, no. 52, pp. 13463-13473.
- Zhao, H, Sood, R, Jutila, A, Bose, S, Fimland, G, Nissen-Meyer, J, Kinnunen, PKJ **2006**, 'Interaction of the antimicrobial peptide pheromone Plantaricin A with model membranes: Implications for a novel mechanism of action', **Biochimica et Biophysica Acta. Biomembranes**, vol 1758, pp. 1461-1474.
- 2007**
- Balistreri, G, Caldentey, J, Kääriäinen, L, Ahola, T **2007**, 'Enzymatic defects of the nsP2 proteins of Semliki Forest virus temperature-sensitive mutants', **Journal of Virology**, vol 81, no. 6, pp. 2849-2860.
- Bertling, E, Quintero-Monzon, O, Mattila, PK, Goode, BL, Lappalainen, P **2007**, 'Mechanism and biological role of profilin-Srv2/CAP interaction', **Journal of Cell Science**, vol 120, pp. 1225-1234.
- Feng, D, Zhao, X, Soromani, C, Toikkanen, J, Römisch, K, Vembar, SS, Brodsky, JL, Keränen, S, Jääntti, J **2007**, 'The transmembrane domain is sufficient for Sbh1p function, its association with the Sec61 complex, and interaction with Rtn1p', **Journal of Biological Chemistry**, vol 282, no. 42, pp. 30618-30628.
- Gershman, B, Puig, O, Hang, L, Peitzsch, RM, Tatar, M, Garofalo, RS **2007**, 'High-resolution dynamics of the transcriptional response to nutrition in Drosophila: a key role for dFOXO', **Physiological Genomics**, vol 29, pp. 24-34.
- Jääskeläinen, KM, Kaukinen, P, Minskaya, E, Plyusnina, A, Vapalahti, O, Elliott, RM, Weber, F, Vaheri, A, Plijusnina, A **2007**, 'Tula and Puumala hantavirus NSs ORFs are functional and the products inhibit activation of the interferon-beta promoter', **Journal of Medical Virology**, vol 79, no. 10, pp. 1527-1536.
- Krogerus, C, Samuilova, O, Pöyry, T, Jokitalo, E, Hyypiä, T **2007**, 'Intracellular localization and effects of individually expressed human parechovirus 1 non-structural proteins', **Journal of General Virology**, vol 88, pp. 831-841.
- Kuokkanen, E, Smith, W, Mäkinen, M, Tuominen, H, Puhka, M, Jokitalo, E, Duvet, S, Berg, T, Heikinheimo, P **2007**, 'Characterization and subcellular localization of human neutral class II -mannosidase cytosolic enzymes/free oligosaccharides/glycoside hydrolase family 38/M2C1/N-glycosylation', **Glycobiology**, vol 17, no. 10, pp. 1084-1093.
- Li, H, Khirug, S, Cai, C, Ludwig, A, Blaesse, P, Kolikova, J, Afzalov, R, Coleman, SK, Lauri, S, Airaksinen, MS, Keinänen, K, Khiroug, L, Saarma, M, Kaila, K, Rivera, C **2007**, 'KCC2 interacts with the dendritic cytoskeleton to promote spine development', **Neuron**, vol 56, no. 6, pp. 1019-1033.
- Linder, MD, Uronen, R, Hölttä-Vuori, M, Siljuis, PVD, Peränen, J, Ikonen, E, Linder, M **2007**, 'Rab8-dependent recycling promotes endosomal cholesterol removal in normal and sphingolipidosis cells', **Molecular Biology of the Cell**, vol 18, pp. 47-56.
- Lindholm, P, Voutilainen, M, Lauren, J, Peränen, J, Leppänen, V, Andressoo, J, Lindahl, M, Janhunen, S, Kalkkinen, N, Timmusk, T, Tuominen, RK, Saarma, M **2007**, 'Novel neurotrophic factor CDNF protects and rescues midbrain dopamine neurons in vivo', **Nature**, vol 448, no. 7147, pp. 73-78.
- Luo, X, Puig, O, Hyun, J, Bohmann, D, Jasper, H **2007**, 'Foxo and Fos regulate the decision between cell death and survival in response to UV irradiation', **EMBO Journal**, vol 26, no. 2, pp. 380-390.
- Marr, MT, D'Alessio, JA, Puig, O, Tjian, R **2007**, 'IRES-mediated functional coupling of transcription and translation amplifies insulin receptor feedback', **Genes & Development**, vol 21, pp. 175-183.
- Mattila, PK, Pykäläinen, A, Saarikangas, J, Paavilainen, VO, Vihinen, H, Jokitalo, E, Lappalainen, P **2007**, 'Missing-in-metastasis and IRSp53 deform PI(4,5)P-rich membranes by an inverse BAR domain-like mechanism', **Journal of Cell Biology**, vol 176, no. 7, pp. 953-964.
- Nachury, MV, Loktev, AV, Zhang, Q, Westlake, CJ, Peränen, J, Merdes, A, Slusarski, DC, Scheller, RH, Bazan, JF, Sheffield, VC, Jackson, PK **2007**, 'A Core complex of BBS proteins cooperates with the GTPase Rab8 to promote ciliary membrane biogenesis', **Cell**.
- Orsini, L, Pajunen, M, Hanski, I, Savilahti, H **2007**, 'SNP discovery by mismatch-targeting of Mu transposition', **Nucleic Acids Research**, vol 35, no. 6, s.



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

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

CellMolBiol/Lappalainen

- Paavilainen, VO, Hellman, M, Helfer, E, Bovellan, M, Annala, A, Carlier, M, Permi, P, Lappalainen, P 2007, 'Structural basis and evolutionary origin of actin filament capping by twinfilin', **Proceedings of the National Academy of Sciences of the United States of America**, vol 104, no. 9, pp. 3113-3118.
- Pajunen, M, Turakainen, H, Poussu, E, Peränen, J, Vihinen, M, Savilahti, H 2007, 'High-precision mapping of protein-protein interfaces: an integrated genetic strategy combining en masse mutagenesis and DNA-level parallel analysis on a yeast two-hybrid platform', **Nucleic Acids Research**, vol 35, no. 16, e103, [11] s.
- Puhka, M, Vihinen, H, Joensuu, M, Jokitalo, E 2007, 'Endoplasmic reticulum remains continuous and undergoes sheet-to-tubule transformation during cell division in mammalian cells', **Journal of Cell Biology**, vol 179, pp. 895-909.
- Puig, O, Bragado-Nilsson, E, Koski, T, Seraphin, B 2007, 'The U1 snRNP-associated factor Luc7p affects 5' splice site selection in yeast and human', **Nucleic Acids Research**, vol 35, no. 17, pp. 5874-5885.
- Quintero, IB, Araujo, CL, Pulkka, AE, Wirkkala, RS, Herrala, AM, Eskelinen, E, Jokitalo, E, Hellström, PA, Tuominen, HJ, Hirvikoski, PP, Vihko, P 2007, 'Prostatic acid phosphatase is not a prostate specific target', **Cancer Research**, vol 67, no. 14, pp. 6549-6554.
- Roland, JT, Kenworthy, AK, Peränen, J, Caplan, S, Goldenring, JR 2007, 'Myosin Vb interacts with Rab8a on a tubular network containing EHD1 and EHD3[supD][supV]', **Molecular Biology of the Cell**.
- Spuul, P, Salonen, A, Merits, A, Jokitalo, E, Kääriäinen, L, Ahola, T 2007, 'Role of the amphipathic peptide of Semliki Forest virus replicase protein nsP1 in membrane association and virus replication', **Journal of Virology**, vol 81, no. 2, pp. 872-883.
- Stasyk, T, Schiefermeier, N, Skvortsov, S, Zwierzina, H, Peränen, J, Bonn, GK, Huber, LA 2007, 'Identification of endosomal epidermal growth factor receptor signaling targets by functional organelle proteomics', **Molecular and Cellular Proteomics**.
- Tu Quoc, PH, Genevaux, P, Pajunen, M, Savilahti, H, Georgopoulos, C 2007, 'Isolation and characterization of biofilm formation-defective mutants of *Staphylococcus aureus*', **Infection and Immunity**, vol 75, no. 3, pp. 1079-1088.
- Uvarov, P, Ludwig, A, Markkanen, M, Pruunsild, P, Kaila, K, Delpire, E, Timmusk, T, Rivera, C, Airaksinen, MS 2007, 'A novel N-terminal isoform of the neuron-specific K-Cl cotransporter KCC2', **Journal of Biological Chemistry**, vol 282, no. 42, pp. 30570-30576.
- Vartiainen, MK, Guettler, S, Larjani, B, Treisman, R 2007, 'Nuclear actin regulates dynamic subcellular localization and activity of the SRF cofactor MAL', **Science**, vol 316, pp. 1749-1752.
- Westberg, JA, Serlachius, M, Lankila, P, Penkowa, M, Hidalgo, J, Andersson, LC 2007, 'Hypoxic preconditioning induces neuroprotective stanniocalcin-1 in brain via IL-6 signaling', **Stroke**, vol 38, no. 3, pp. 1025-1030.
- Westerberg, JA, Serlachius, M, Lankila, P, Andersson, LC 2007, 'Hypoxic preconditioning induces elevated expression of stanniocalcin-1 in the heart', **American Journal of Physiology: Heart and Circulatory Physiology**, vol 293, no. 3, pp. H1766-H1771.
- 2008**
- Cai, C, Li, H, Kangasniemi, A, Pihlajamaa, T, Ossowski von, L, Kerkelä, KM, Schulz, S, Rivera Baeza, C, Keinänen, K 2008, 'Somatostatin receptor subtype 1 is a PDZ ligand for synapse-associated protein 97 and a potential regulator of growth cone dynamics', **Neuroscience**, vol 157, no. 4, pp. 833-843.
- Chereau, D, Malgorzata, B, Skwarek-Maruszewska, A, Fujiwara, I, Hayes, DB, Rebowski, G, Lappalainen, P, Pollard, TD, Dominguez, R 2008, 'Leiomodin is an actin filament nucleator in muscle cells', **Science**, vol 320, pp. 239-243.
- Creed, SJ, Bryce, N, Naumanen, P, Weinberger, R, Lappalainen, P, Stehn, J, Gunning, P 2008, 'Tropomyosin isoforms define distinct microfilament populations with different drug susceptibility', **European Journal of Cell Biology**, vol 87, no. 8-9, pp. 709-720.
- Greco, D, Kotronen, A, Westerbacka, J, Puig, O, Arkkila, P, Kiviluoto, T, Laitinen, S, Kolak, M, Fisher, RM, Hamsten, A, Auvinen, P, Yki-Järvinen, H 2008, 'Gene expression in human NAFLD', **American Journal of Physiology: Gastrointestinal and Liver Physiology**, vol 294, no. 5, pp. G1281-G1287.
- Guettler, S, Vartiainen, MK, Miralles, F, Larjani, B, Treisman, R 2008, 'RPEL motifs link the serum response factor cofactor MAL but not myocardin to Rho signaling via actin binding', **Molecular and Cellular Biology**, vol 28, pp. 732-742.
- Harvey, KF, Mattila, J, Sofer, A, Bennett, FC, Ramsey, MR, Ellisen, LW, Puig, O, Hariharan, IK 2008, 'FOXO-regulated transcription restricts overgrowth of Tsc mutant organs', **Journal of Cell Biology**, vol 180, no. 4, pp. 691-696.
- Ilmarinen, T, Kangas, H, Kytömaa, T, Eskelin, P, Saharinen, J, Seeler, J, Tanhuanpää, K, Chan, FY, Slattery, RM, Alakurtti, K, Palvimo, JJ, Ulmanen, I 2008, 'Functional interaction of AIRE with PIAS1 in transcriptional regulation', **Molecular Immunology**, vol 45, no. 7, pp. 1847-1862.
- Jansen, M, Pietiäinen, V, Pölonen, H, Rasilainen, L, Koivusalo, M, Ruotsalainen, U, Jokitalo, E, Ikonen, E 2008, 'Cholesterol substitution increases the structural heterogeneity of caveolae', **Journal of Biological Chemistry**, vol 283, no. 21, pp. 14610-14618.
- Kallio, KAE, Buhlin, K, Jauhainen, M, Keva, R, Tuomainen, A, Klinge, B, Gustafsson, A, Pussinen, P 2008, 'Lipopolysaccharide associates with pro-atherogenic lipoproteins in periodontitis patients', **Innate Immunity**, vol 14, no. 4, pp. 247-254.
- Kallio, E, Buhlin, K, Jauhainen, M, Keva, RM, Tuomainen, A, Klinge, B, Gustafsson, A, Pussinen, P 2008, 'Lipopolysaccharide associates with proatherogenic lipoproteins in periodontitis patients.', **Innate Immunity**, vol 2008 / 14, pp. 247-253.



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

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

CellMolBiol/Lappalainen

- Korhonen, L, Hansson, I, Maugras, C, Wehrle, R, Kairisalo, M, Borgkvist, A, Jokitalo, E, Sotelo, C, Fisone, G, Dusart, I, Lindholm, D 2008, 'Expression of X-chromosome linked inhibitor of apoptosis protein in mature purkinje cells and in retinal bipolar cells in transgenic mice induces neurodegeneration', **Neuroscience**, vol 156, no. 3, pp. 515-526.
- Kuoppamaa, H, Skrobuk, P, Sihvo, M, Hiukka, A, Chibalin, AV, Zierath, JR, Koistinen, HA 2008, 'Globular adiponectin stimulates glucose transport in type 2 diabetic muscle', **Diabetes - Metabolism: Research and Reviews (Print Edition)**, vol 24, no. 7, pp. 554-564.
- Lindholm, P, Peränen, J, Andressoo, J, Kalkkinen, N, Kokaia, Z, Lindvall, O, Timmusk, T, Saarma, M 2008, 'MANF is widely expressed in mammalian tissues and differently regulated after ischemic and epileptic insults in rodent brain', **Molecular and Cellular Neuroscience**, vol 39, no. 3, pp. 356-371.
- Lulla, V, Sawicki, DL, Sawicki, SG, Lulla, A, Merits, A, Ahola, T 2008, 'Molecular defects caused by temperature-sensitive mutations in Semliki Forest virus nsP1', **Journal of Virology**, vol 82, no. 18, pp. 9236-9244.
- Lyly, A, Marjavaara, SK, Kyttälä, A, Uusi-Rauva, K, Luoro, K, Kopra, O, Martinez, LO, Tanhuanpää, K, Kalkkinen, N, Suomalainen, A, Jauhainen, M, Jalanko, A 2008, 'Deficiency of the INCL protein Ppt1 results in changes in ectopic F-1-ATP synthase and altered cholesterol metabolism', **Human Molecular Genetics**, vol 17, no. 10, pp. 1406-1417.
- Mattila, J, Kallijärvi, J, Puig, O 2008, 'RNAi screening for kinases and phosphatases identifies FoxO regulators', **Proceedings of the National Academy of Sciences of the United States of America**, vol 105, no. 39, pp. 14873-14878.
- Naumanen, P, Lappalainen, P, Hotulainen, P 2008, 'Mechanisms of actin stress fibre assembly', **Journal of Microscopy**, vol 231, no. 3, pp. 446-454.
- Paatero, AO, Turakainen, H, Happonen, LJ, Olsson, C, Palomäki, T, Pajunen, MI, Meng, X, Otonkoski, T, Tuuri, T, Berry, C, Malani, N, Frilander, MJ, Bushman, F, Savilahti, H 2008, 'Bacteriophage Mu integration in yeast and mammalian genomes', **Nucleic Acids Research**, vol 36, no. 22, pp. e148.
- Paavilainen, VO, Oksanen, E, Goldman, A, Lappalainen, P 2008, 'Structure of the actin-depolymerizing factor homology domain in complex with actin', **Journal of Cell Biology**, vol 182, no. 1, pp. 51-59.
- Papp, E, Rivera Baeza, C, Kaila, K, Freund, TF 2008, 'Relationship between neuronal vulnerability and potassium-chloride cotransporter 2 immunoreactivity in hippocampus following transient forebrain ischemia', **Neuroscience**, vol 154, no. 2, pp. 677-689.
- Paveliev, M, Hienola, A, Jokitalo, E, Planken, A, Beshpalov, MM, Rauvala, H, Saarma, M 2008, 'Sensory neurons from N-syndecan-deficient mice are defective in survival', **NeuroReport**, vol 19, no. 14, pp. 1397-1400.
- Pispa, J, Pummila, M, Barker, PA, Thesleff, I, Mikkola, ML 2008, 'Edar and Troy signalling pathways act redundantly to regulate initiation of hair follicle development', **Human Molecular Genetics**, vol 17, no. 21, pp. 3380-3391.
- Pispa, J, Palmen, S, Holmberg-Still, C, Jääntti, J, Palmen, J 2008, 'C. elegans dss-1 is functionally conserved and required for oogenesis and larval growth', **BMC Developmental Biology**, vol 8, no. 51, pp. 1-13.
- Pohjala, L, Barai, V, Azharyev, A, Lapinjoki, S, Ahola, T 2008, 'A luciferase-based screening method for inhibitors of alphavirus replication applied to nucleoside analogues', **Antiviral Research**, vol 78, no. 3, pp. 215-222.
- Puig, O, Vihervaara, T 2008, 'dFOXO regulates transcription of a Drosophila acid lipase', **Journal of Molecular Biology**, vol 376, no. 5, pp. 1215-1223.
- Saarikangas, J, Hakanen, J, Mattila, PK, Grumet, M, Salminen, M, Lappalainen, P 2008, 'ABBA regulates plasma-membrane and actin dynamics to promote radial glia extension', **Journal of Cell Science**, vol 121, no. 9, pp. 1444-1454.
- Scita, G, Confalonieri, S, Lappalainen, P, Suetsugu, S 2008, 'IRSp53: crossing the road of membrane and actin dynamics in the formation of membrane protrusions', **Trends in Cell Biology**, vol 18, no. 2, pp. 52-60.
- Shulga, A, Thomas-Crusells, J, Sigl, T, Blaesse, A, Mestres, P, Meyer, M, Yan, Q, Kaila, K, Saarma, M, Rivera, C, Giehl, KM 2008, 'Posttraumatic GABA(A)-mediated [Ca²⁺]_i increase is essential for the induction of brain-derived neurotrophic factor-dependent survival of mature central neurons', **Journal of Neuroscience**, vol 28, no. 27, pp. 6996-7005.
- Skarp, KF, Zhao, X, Jääntti, J 2008, 'Use of bimolecular fluorescence complementation in yeast *Saccharomyces cerevisiae*', **Methods in molecular biology**, vol 457, no. 1, pp. 165-175.
- Tsang, WY, Bossard, C, Khanna, H, Peränen, J, Swaroop, A, Malhotra, V, Dynlacht, BD 2008, 'CP110 suppresses primary cilia formation through its interaction with CEP290, a protein deficient in human ciliary disease', **Developmental Cell**, vol 15, no. 2, pp. 187-197.
- Uusi-Rauva, K, Luoro, K, Tanhuanpää, K, Kopra, O, Martin-Vasallo, P, Kyttälä, A, Jalanko, A 2008, 'Novel interactions of CLN3 protein link Batten disease to dysregulation of fodrin-Na, K ATPase complex', **Experimental Cell Research**, vol 314, no. 15, pp. 2895-2905.

2009

- Airavaara, M, Shen, H, Kuo, C, Peränen, J, Saarma, M, Hoffer, B, Wang, Y 2009, 'Mesencephalic astrocyte-derived neurotrophic factor reduces ischemic brain injury and promotes behavioral recovery in rats', **Journal of Comparative Neurology**, vol 515, pp. 116-124.



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

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

CellMolBiol/Lappalainen

- Bach, CTT, Creed, S, Zhong, J, Mahmassani, M, Schevzov, G, Stehn, J, Cowell, LN, Naumanen, P, Lappalainen, P, Gunning, PW, O'Neill, GM 2009, 'Tropomyosin isoform expression regulates the transition of adhesions to determine cell speed and direction', **Molecular and Cellular Biology**, vol 29, no. 6, pp. 1506-1514.
- Blomster, H, Hietakangas, V, Wu, J, Kouvonen, P, Hautaniemi, S, Sistonen, L 2009, 'Novel proteomics strategy brings insight into the prevalence of SUMO-2 target sites', **Molecular and Cellular Proteomics**, vol 8, pp. 1382-1390.
- Chen, Y, Cai, H, Pan, JA, Xiang, N, Tien, P, Ahola, T, Guo, D 2009, 'Functional screen reveals SARS coronavirus nonstructural protein nsp14 as a novel cap N7 methyltransferase', **Proceedings of the National Academy of Sciences of the United States of America**, vol 106, no. 9, pp. 3484-3489.
- Coleman, SK, Möykkynen, T, Jouppila, A, Koskelainen, S, Rivera, C, Korpi, ER, Keinänen, K 2009, 'Agonist occupancy is essential for forward trafficking of AMPA receptors', **Journal of Neuroscience**, vol 29, no. 2, pp. 303-312.
- Hotulainen, P, Llano, O, Tanhuanpää, K, Faix, J, Rivera Baeza, C, Lappalainen, P, Smirnov, S 2009, 'Defining mechanisms of actin polymerization and depolymerization during dendritic spine morphogenesis', **Journal of Cell Biology**, vol 185, no. 2, pp. 323-339.
- Kardos, R, Pozsonyi, K, Nevalainen, E, Lappalainen, P, Nyitrai, M, Hild, G 2009, 'The effects of ADF/cofilin and profilin on the conformation of the ATP-binding cleft of monomeric actin', **Biophysical Journal**, vol 96, no. 6, pp. 2335-2343.
- Laakkonen, JP, Mäkelä, AR, Kakkonen, E, Turkki, P, Kukkonen, S, Peränen, J, Ylä-Herttua, S, Airene, KJ, Oker-Blom, C, Vihinen-Ranta, M, Marjomäki, V 2009, 'Clathrin-independent entry of baculovirus triggers uptake of E. coli in non-phagocytic human cells', **PLoS One**, vol 4, no. 4, pp. e5093, [12s.].
- Lanckriet, A, Timbermont, L, Happonen, LJ, Pajunen, M, Pasmans, F, Haesebrouck, F, Ducatelle, R, Savilahti, H, Van Immerseel, F 2009, 'Generation of single-copy transposon insertions in Clostridium perfringens by electroporation of phage mu DNA transposition complexes', **Applied and Environmental Microbiology**, vol 75, no. 9, pp. 2638-2642.
- Leivonen, S, Makela, R, Ostling, P, Kohonen, P, Haapa-Paananen, S, Kleivi, K, Eerly, E, Aakula, A, Hellström, K, Sahlberg, N, Kristensen, VN, Borresen-Dale, A, Saviranta, P, Perala, M, Kallioniemi, O 2009, 'Protein lysate microarray analysis to identify microRNAs regulating estrogen receptor signaling in breast cancer cell lines', **Oncogene**, vol 28, no. 44, pp. 3926-3936.
- Linder, M, Mäyränpää, M, Peränen, J, Pietilä, T, Pietiäinen, V, Uronen, R, Olkkonen, V, Kovanen, P, Ikonen, E 2009, 'Rab8 regulates ABCA1 cell surface expression and facilitates cholesterol efflux in primary human macrophages', **Arteriosclerosis, Thrombosis, and Vascular Biology**, vol 29, pp. 883-888.
- Malet, H, Coutard, B, Jamal, S, Dutartre, H, Papageorgiou, N, Neuvonen, KM, Ahola, T, Forrester, N, Gould, EA, Lafitte, D, Ferron, F, Lescar, J, Gorbalenya, AE, de Lamballerie, X, Canard, B 2009, 'The crystal structures of chikungunya and venezuelan equine encephalitis virus nsP3 macro domains define a conserved adenosine binding pocket', **Journal of Virology**, vol 83, no. 13, pp. 6534-6545.
- Mattila, JI, Bremer, A, Ahonen, L, Kostianen, R, Puig, O 2009, 'Drosophila FoxO regulates organism size and stress resistance through an adenylate cyclase', **Molecular and Cellular Biology**, vol 29, no. 19, pp. 5357-5365.
- Neuvonen, KM, Ahola, T 2009, 'Differential activities of cellular and viral macro domain proteins in binding of ADP-ribose metabolites', **Journal of Molecular Biology**, vol 385, no. 1, pp. 212-225.
- Nevalainen, EM, Skwarek-Maruszewska, A, Braun, A, Moser, M, Lappalainen, P 2009, 'Two biochemically distinct and tissue-specific twinfilin isoforms are generated from the mouse Twf2 gene by alternative promoter usage', **Biochemical Journal**, vol 417, pp. 593-600.
- Pajunen, M, Poussu, E, Turakainen, H, Savilahti, H 2009, 'Application of Mu in vitro transposition for high-precision mapping of protein-protein interfaces on a yeast two-hybrid platform', **Methods**, vol 49, no. 3, pp. 255-262.
- Palgi, M, Lindström, R, Peränen, J, Piepponen, P, Saarma, M, Heino, TI 2009, 'Evidence that DmMANF is an invertebrate neurotrophic factor supporting dopaminergic neurons', **Proceedings of the National Academy of Sciences of the United States of America**, vol 106, no. 7, pp. 2429-2434.
- Parkash, V, Lindholm, P, Peränen, J, Kalkkinen, N, Oksanen, E, Saarma, M, Leppänen, V, Goldman, A 2009, 'The structure of the conserved neurotrophic factors MANF and CDFN explains why they are bifunctional', **Protein Engineering, Design and Selection**, vol 22, no. 4, pp. 233-241.
- Perttilä, J, Merikanto, K, Naukkarinen, J, Surakka, IL, Martin, NW, Tanhuanpää, K, Grimard, V, Taskinen, M, Thiele, C, Salomaa, V, Jula, A, Perola, M, Virtanen, I, Palotie, L, Olkkonen, VM 2009, 'OSBPL10, a novel candidate gene for high triglyceride trait in dyslipidemic Finnish subjects, regulates cellular lipid metabolism', **Journal of Molecular Medicine**, vol 87, no. 8, pp. 825-835.
- Pohjala, L, Alakurtti, S, Ahola, T, Yli-Kauhaluoma, J, Tammela, P 2009, 'Betulin-derived compounds as inhibitors of alphavirus replication', **Journal of Natural Products**, vol 72, no. 11, pp. 1917-1926.
- Quintero-Monzon, O, Jonasson, EM, Bertling, EA, Talarico, L, Chaudhry, F, Sihvo, M, Lappalainen, P, Goode, BL 2009, 'Reconstitution and dissection of the 600-kDa Srv2/CAP complex: roles for oligomerization and cofilin-actin binding in driving actin turnover', **Journal of Biological Chemistry**, vol 284, no. 16, pp. 10923-10934.
- Rasila, TS, Pajunen, MI, Savilahti, H 2009, 'Critical evaluation of random mutagenesis by error-prone polymerase chain reaction protocols, Escherichia coli mutator strain, and hydroxylamine treatment', **Analytical Biochemistry**, vol 388, no. 1, pp. 71-80.



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

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

CellMolBiol/Lappalainen

- Rzadzinska, AK, Nevalainen, EM, Prosser, HM, Lappalainen, P, Steel, KP **2009**, 'MyosinVIIa interacts with twinfilin-2 at the tips of mechanosensory stereocilia in the inner ear', **PLoS One**, vol 4, no. 9, pp. e7097.
- Saarikangas, J, Zhao, H, Pykäläinen, A, Laurinmäki, P, Mattila, PK, Kinnunen, PKJ, Butcher, SJ, Lappalainen, P **2009**, 'Molecular mechanisms of membrane deformation by I-BAR domain proteins', **Current Biology**, vol 19, no. 2, pp. 95-107.
- Shulga, A, Blaesse, A, Kysenius, K, Huttunen, HJ, Tanhuanpää, K, Saarma, M, Rivera, C **2009**, 'Thyroxin regulates BDNF expression to promote survival of injured neurons', **Molecular and Cellular Neuroscience**, vol 42, no. 4, pp. 408-418.
- Skwarek-Maruszewska, A, Hotulainen, P, Mattila, PK, Lappalainen, P **2009**, 'Contractility-dependent actin dynamics in cardiomyocyte sarcomeres', **Journal of Cell Science**, vol 122, pp. 2119-2126.
- Szuplewski, S, Sandmann, T, Hietakangas, V, Cohen, SM **2009**, 'Drosophila Minus is required for cell proliferation and influences Cyclin E turnover', **Genes & Development**, vol 23, pp. 1998-2003.
- Säälik, P, Padari, K, Niinep, A, Lorents, A, Hansen, M, Jokitalo, E, Langel, U, Pooga, M **2009**, 'Protein delivery with transportans is mediated by caveolae rather than flotillin-dependent pathways', **Bioconjugate Chemistry**, vol 20, no. 5, pp. 877-887.
- Turakainen, H, Saarimäki-Vire, J, Sinjushina, N, Partanen, J, Savilahti, H **2009**, 'Transposition-based method for the rapid generation of gene-targeting vectors to produce Cre/Flp-modifiable conditional knock-out mice', **PLoS One**, vol 4, no. 2, pp. e4341.
- Uvarov, P, Ludwig, A, Markkanen, M, Soni, S, Hubner, CA, Rivera, C, Airaksinen, MS **2009**, 'Coexpression and Heteromerization of Two Neuronal K-Cl Cotransporter Isoforms in Neonatal Brain', **Journal of Biological Chemistry**, vol 284, no. 20, pp. 13696-13704.
- Voutilainen, M, Bäck, S, Pörsti, E, Toppinen, L, Lindgren, L, Lindholm, P, Peränen, J, Saarma, M, Tuominen, RK **2009**, 'Mesencephalic astrocyte-derived neurotrophic factor is neurorestorative in rat model of Parkinson's Disease', **Journal of Neuroscience**, vol 29, no. 30, pp. 9651-9659.
- Wu, Z, Xuanyuan, Z, Li, R, Jiang, D, Li, C, Xu, H, Bai, Y, Zhang, X, Turakainen, H, Saris, PEJ, Savilahti, H, Qiao, M **2009**, 'Mu transposition complex mutagenesis in *Lactococcus lactis*: identification of genes affecting nisin production', **Journal of Applied Microbiology**, vol 106, no. 1, pp. 41-48.
- Ylä-Anttila, P, Vihinen, H, Jokitalo, E, Eskelinen, E **2009**, '3D tomography reveals connections between the phagophore and endoplasmic reticulum', **Autophagy**, vol 5, no. 8, pp. 1180-1185.
- Zhao, X, Jääntti, J **2009**, 'Functional characterization of the trans-membrane domain interactions of the Sec61 protein translocation complex beta-subunit', **BMC Cell Biology**, vol 10, no. 76, 11 s.
- 2010**
- Airavaara, M, Chiocco, MJ, Howard, DB, Zuchowski, KL, Peränen, J, Liu, C, Fang, S, Hoffer, BJ, Wang, Y, Harvey, BK **2010**, 'Widespread cortical expression of MANF by AAV serotype 7: Localization and protection against ischemic brain injury', **Experimental Neurology**, vol 225, no. 1, pp. 104-113.
- Gandhi, M, Smith, BA, Bovellan, M, Paavilainen, V, Daugherty-Clarke, K, Gelles, J, Lappalainen, P, Goode, BL **2010**, 'GMF Is a Cofilin Homolog that Binds Arp2/3 Complex to Stimulate Filament Debranching and Inhibit Actin Nucleation', **Current Biology**, vol 20, no. 9, pp. 861-867.
- Hellman, M, Peränen, J, Saarma, M, Permi, P **2010**, '¹H, ¹³C and ¹⁵N resonance assignments of the human mesencephalic astrocyte-derived neurotrophic factor.', **Biomolecular NMR assignments**, vol 4, no. 2, pp. 215-217.
- Kyrölähti, A, Kauppinen, M, Lind, E, Unkila-Kallio, L, Butzow, R, Klefström, J, Wilson, DB, Anttonen, M, Heikinheimo, M **2010**, 'GATA4 protects granulosa cell tumors from TRAIL-induced apoptosis', **Endocrine - Related Cancer**, vol 17, no. 3, pp. 709-717.
- Li, Q, Song, X, Zou, J, Wang, G, Kremneva, E, Li, X, Zhu, N, Lappalainen, P, Yuan, W, Qin, Y, Jing, Q **2010**, 'Errata: Attenuation of microRNA-1 derepresses the cytoskeleton regulatory protein twinfilin-1 to provoke cardiac hypertrophy', **Journal of Cell Science**, vol 123, no. 15, pp. 2680-2680.
- Li, Q, Song, X, Zou, J, Wang, G, Kremneva, E, Li, X, Zhu, N, Sun, T, Lappalainen, P, Yuan, W, Qin, Y, Jing, Q **2010**, 'Attenuation of microRNA-1 derepresses the cytoskeleton regulatory protein twinfilin-1 to provoke cardiac hypertrophy', **Journal of Cell Science**, vol 123, no. 14, pp. 2444-2452.
- Lonka-Nevalaita, L, Lume, M, Leppänen, SM, Jokitalo, E, Peränen, J, Saarma, M **2010**, 'Characterization of the Intracellular Localization, Processing, and Secretion of Two Glial Cell Line-Derived Neurotrophic Factor Splice Isoforms', **Journal of Neuroscience**, vol 30, no. 34, pp. 11403-11413.
- Monfregola, J, Napolitano, G, D'Urso, M, Lappalainen, P, Ursini, MV **2010**, 'Functional Characterization of Wiskott-Aldrich Syndrome Protein and Scar Homolog (WASH), a Bi-modular Nucleation-promoting Factor Able to Interact with Biogenesis of Lysosome-related Organelle Subunit 2 (BLOS2) and gamma-Tubulin', **Journal of Biological Chemistry**, vol 285, no. 22, pp. 16951-16957.
- Pajunen, M, Rasila, T, Happonen, L, Lamberg, A, Haapa-Paananen, S, Kiljunen, SJ, Savilahti, H **2010**, 'Universal platform for quantitative analysis of DNA transposition', **Mobile DNA**, vol 1, no. 24.
- Pawlowski, R, Rajakylä, E, Vartiainen, MK, Treisman, R **2010**, 'An actin-regulated importin alpha/beta-dependent extended bipartite NLS directs nuclear import of MTRF-A', **EMBO Journal**, vol 29, pp. 3448-3458.



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

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

CellMolBiol/Lappalainen

- Murga-Zamalloa CA, Atkins SJ, Peränen J, Swaroop A, Khanna H. **2010**, 'Interaction of retinitis pigmentosa GTPase regulator (RPGR) with RAB8A GTPase: implications for cilia dysfunction and photoreceptor degeneration', **Human Molecular Genetics**, vol 19, no. 18, pp. 3591-3598.
- Knödler A, Feng S, Zhang J, Zhang X, Das A, Peränen J, Guo W. **2010**, 'Coordination of Rab8 and Rab11 in primary ciliogenesis', **Proceedings of the National Academy of Sciences of the United States of America**, vol 2010, no. 107, pp. 6346-6351.
- Bryant DM, Datta A, Rodríguez-Fraticelli AE, Peränen J, Martín-Belmonte F, Mostov KE. **2010**, 'A molecular network for de novo generation of the apical surface and lumen.', **Nature Cell Biology**, vol 12, no. 11, pp. 1035-1045.
- Ramalingam, N, Zhao, H, Breitsprecher, D, Lappalainen, P, Faix, J, Schleicher, M **2010**, 'Phospholipids regulate localization and activity of mDia1 formin', **European Journal of Cell Biology**, vol 89, no. 10, pp. 723-732.
- Saarikangas, J, Zhao, H, Lappalainen, P **2010**, 'Regulation of the Actin Cytoskeleton-Plasma Membrane Interplay by Phosphoinositides', **Physiological Reviews**, vol 90, no. 4, pp. 259-289.
- Sarek, G, Järviuoma, A, Moore, HM, Tojkander, S, Vartia, S, Biberfeld, P, Laiho, M, Ojala, PM **2010**, 'Nucleophosmin phosphorylation by v-cyclin-CDK6 controls KSHV latency', **PLoS Pathogens**, vol 6, no. 3, pp. Article Number: e1000818.
- Schollenberger, L, Gronemeyer, T, Huber, CM, Lay, D, Wiese, S, Meyer, HE, Warscheid, B, Saffrich, R, Peränen, J, Gorgas, K, Just, WW **2010**, 'RhoA Regulates Peroxisome Association to Microtubules and the Actin Cytoskeleton', **PLoS One**, vol 5, no. 11, pp. e13886.
- Skarp, K, Vartiainen, MK **2010**, 'Actin on DNA: An Ancient and Dynamic Relationship', **Cell Motility and the Cytoskeleton**, vol 67, no. 8, pp. 487-495.
- Skwarek-Maruszewska, A, Boczkowska, M, Zajac, AL, Kremneva, E, Svitkina, T, Dominguez, R, Lappalainen, P **2010**, 'Different Localizations and Cellular Behaviors of Leiomodin and Tropomodulin in Mature Cardiomyocyte Sarcomeres', **Molecular Biology of the Cell**, vol 21, no. 19, pp. 3352-3361.
- Spuul, P, Balistreri, G, Kääriäinen, LJ, Ahola, T **2010**, 'Phosphatidylinositol 3-Kinase-, Actin-, and Microtubule-Dependent Transport of Semliki Forest Virus Replication Complexes from the Plasma Membrane to Modified Lysosomes', **Journal of Virology**, vol 84, no. 15, pp. 7543-7557.
- Weber, M, Chernov, K, Turakainen, H, Wohlfahrt, G, Pajunen, M, Savilahti, H, Jantti, J **2010**, 'Mso1p Regulates Membrane Fusion through Interactions with the Putative N-Peptide-binding Area in Sec1p Domain 1', **Molecular Biology of the Cell**, vol 21, no. 8, pp. 1362-1374.
- Yuan, Q, Jääntti, J **2010**, 'Functional Analysis of Phosphorylation on Saccharomyces cerevisiae Syntxin 1 Homologues Sso1p and Sso2p', **PLoS One**, vol 5, no. 10, pp. e13323.
- Zhao, H, Hakala, M, Lappalainen, P **2010**, 'ADF/Cofilin Binds Phosphoinositides in a Multivalent Manner to Act as a PIP2-Density Sensor', **Biophysical Journal**, vol 98, pp. 2327-2336.

A2 Review in scientific journal

2005

- Kaukinen, P, Vaheri, A, Plyusnin, A **2005**, 'Hantavirus nucleocapsid protein: a multifunctional molecule with both housekeeping and ambassadorial duties', **Archives of Virology**, vol 150, no. 8, pp. 1693-1713.
- Magden, J, Kääriäinen, L, Ahola, T **2005**, 'Inhibitors of virus replication: recent developments and prospects', **Applied Microbiology and Biotechnology**, vol 66, pp. 612-621.
- Nevalainen, E, Lappalainen, P **2005**, 'Twinfilin-2', **UCSD-Nature Molecule pages**, vol 2005.
- Nevalainen, E, Lappalainen, P **2005**, 'Twinfilin-1', **UCSD-Nature Molecule pages**.
- Rivera, C, Voipio, J, Kaila, K **2005**, 'Two developmental switches in GABAergic signalling: the K-Cl cotransporter KCC2 and carbonic anhydrase CAVII', **Journal of Physiology**, vol 562, no. 1, pp. 27-36.
- Salonen, A, Ahola, T, Kääriäinen, LJ **2005**, 'Viral RNA replication in association with cellular membranes', **Current Topics in Microbiology and Immunology**, vol 285, pp. 139-173.

2006

- Puig, O, Tjian, R **2006**, 'Nutrient availability and growth - Regulation of insulin signaling by dFOXO/FOXO1', **Cell Cycle**, vol 5, no. 5, pp. 503-505.
- Skwarek-Maruszewska, A, Hotulainen, P, Lappalainen, P **2006**, 'Regulation of the actin cytoskeleton by phospholipids', **Advances in Molecular and Cell Biology**, vol 37, pp. 201-219.

2008

- Vartiainen, MK **2008**, 'Nuclear actin dynamics: From form to function', **FEBS Letters**, vol 582, no. 14, pp. 2033-2040.



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

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

CellMolBiol/Lappalainen

2009

Blaesse, P, Airaksinen, MS, Rivera, C, Kaila, K **2009**, 'Cation-chloride cotransporters and neuronal function', **Neuron**, vol 61, no. 6, pp. 820-838.

A3 Contribution to book/other compilations (refereed)

2009

Ylä-Anttila, P, Vihinen, H, Jokitalo, E, Eskelinen, E **2009**, 'Monitoring autophagy by electron microscopy in mammalian cells', **Methods in enzymology**, vol. 452, **Academic Press**, pp. 143-164.

B1 Unrefereed journal article

2005

Puig, O, Tjian, R **2005**, 'Transcriptional feedback control of insulin receptor by dFOXO/FOXO1', **Genes & Development**, vol 19, pp. 2435-2446.

2007

Kääriäinen, L, Ahola, T **2007**, 'Molekyyli tiedon avulla influenssaa vastaan', **Duodecim**, vol 123, pp. 899-907.

2008

Mattila, PK, Lappalainen, P **2008**, 'Filopodia: molecular architecture and cellular functions', **Nature Reviews. Molecular Cell Biology**, vol 9, pp. 446-454.

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

2007

Nevalainen, E, Paavilainen, V, Lappalainen, P **2007**, 'Twinfilin family of actin monomer-binding proteins', in P Lappalainen (ed.), **Actin Monomer Binding Proteins, Landes Bioscience, New York, NY**, pp. 53-60.

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.

D2 Article in professional hand or guide book or in a professional data system, or text book material

2010

Hyypiä, T, Ahola, T, Söderlund-Venermo, AM **2010**, 'Virusten lisääntyminen', in P Huovinen, K Hedman, T Heikkinen, A Järvinen, S Meri, M Vaara (eds), **Mikrobiologia . mikrobiologia, immunologia ja infektiosairaudet, Kirja 1.**, vol. 2010, **Duodecim, Helsinki**, pp. 460-469.



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

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

CellMolBiol/Lappalainen

1 Analysis of activities 2005-2010

Associated person is one of Pekka Lappalainen , Eija Jokitalo , Ville Hietakangas ,
Jussi Jääntti , Claudio Rivera Baeza , Maria Vartiainen ,
Tero Ahola , Oscar Puig, Harri Savilahti, Kirsi Hellström , Pasi Kaukinen , Katri Maarit
Neuvonen , Elisa Kallio , Johan Peränen , Pirjo Spuul ,
Giuseppe Balistreri , Julia Perttilä , Guillaume Huet , Joseph Bayor Dopie ,
Kari-Pekka Ferdinand Skarp , Eeva Rajakylä , Kimmo Tanhuanpää ,
Anette Maaria Pykäläinen , Helena Vihinen , Majja Kaarina Puhka ,
Merja Susanna Joensuu , Olli Rämö , Juha Saarikangas ,
Jaakko Mattila , Essi Lind , Kiran Hasygar , Mari Teesalu , Maarit
Hannele Makkonen , Nina Kaarina Aro , Konstantin Chernov , Yaming Jiu ,
Johanna Maria Pispä , Xueqiang Zhao, Marion Weber , Qiang Yuan ,
Gergana Gateva , Hongxia Zhao , Eva Martina Serlachius ,
Minna Poukkula , Sari Susanna Tojkander , Elena Kremneva ,

Activity type	Count
Supervisor or co-supervisor of doctoral thesis	29
Prizes and awards	4
Editor of research journal	3
Peer review of manuscripts	62
Assessment of candidates for academic posts	6
Membership or other role in review committee	13
Membership or other role in research network	7
Membership or other role in national/international committee, council, board	10
Membership or other role in public Finnish or international organization	4
Participation in interview for written media	5
Participation in radio programme	1



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

CellMolBiol/Lappalainen

2 Listing of activities 2005-2010

Supervisor or co-supervisor of doctoral thesis

Pekka Lappalainen ,

Supervisor of Doctoral thesis, Pekka Lappalainen, 2007
Supervisor of Doctoral thesis, Pekka Lappalainen, 2007
Supervisor of Doctoral thesis, Pekka Lappalainen, 2008
Supervisor of Doctoral thesis, Pekka Lappalainen, 2009
Supervisor of Doctoral thesis, Pekka Lappalainen, 2009
Supervisor of Doctoral thesis, Pekka Lappalainen, 2010

Eija Jokitalo ,

Supervisor of Doctoral thesis, Eija Jokitalo, 2003 → 2010, Finland
Supervisor of Doctoral thesis, Eija Jokitalo, 2007 → ..., Finland
Supervisor of Doctoral thesis, Eija Jokitalo, 2008 → ..., Finland

Ville Hietakangas ,

Co-supervisor of Doctoral thesis, Ville Hietakangas, 2008 → ...
Co-supervisor of Doctoral thesis, Ville Hietakangas, 2008 → ...
Supervisor of Doctoral thesis, Ville Hietakangas, 2009 → ...
Supervisor of Doctoral thesis, Ville Hietakangas, 2009 → ...
Supervisor of Doctoral thesis, Ville Hietakangas, 2010 → ...

Jussi Jäntti ,

Supervisor of Doctoral thesis, Jussi Jäntti, 2008 → ...
Supervisor of Doctoral thesis, Jussi Jäntti, 2010

Claudio Rivera Baeza ,

Supervisor of Doctoral thesis, Claudio Rivera Baeza, 2008
Supervisor of Doctoral thesis, Claudio Rivera Baeza, 2008
Supervisor of Doctoral thesis, Claudio Rivera Baeza, 2009 → ...
Supervisor of Doctoral thesis, Claudio Rivera Baeza, 2010
Supervisor of Doctoral thesis, Claudio Rivera Baeza, 2010 → ...
Supervisor of Doctoral thesis, Claudio Rivera Baeza, 2010 → ...

Tero Ahola ,

Supervision of doctoral thesis, Tero Ahola, 2002 → 2006, Finland
Supervision of doctoral thesis, Tero Ahola, 2003 → 2008
Supervision of doctoral thesis, Tero Ahola, 2005 → 2010
Supervision of doctoral thesis, Tero Ahola, 2005 → 2010
Supervision of doctoral thesis, Tero Ahola, 2006 → 2010
Supervision of doctoral thesis, Tero Ahola, 2006 → 2011
Supervision of doctoral thesis, Tero Ahola, 2010 → ...

Prizes and awards

Pekka Lappalainen ,



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

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

CellMolBiol/Lappalainen

Director of Helsinki Graduate School in Biotechnology and Molecular Biology, Pekka Lappalainen, 2005 → 2010

Jussi Jääntti ,

Faculty of Biosciences prize for excellent supervision of Master's thesis, Jussi Jääntti, 2005

Gergana Gateva ,

Scholarship for foreign students, Gergana Gateva, 01.04.2008 → 31.12.2008, Germany

Best Student Poster Award, Gergana Gateva, 18.09.2010, Germany

Editor of research journal

Pekka Lappalainen ,

Member of editorial board, Cell Motility and the Cytoskeleton, Pekka Lappalainen, 2006 → 2009

Executive editor of Cytoskeleton, Pekka Lappalainen, 2010

Tero Ahola ,

Editor, BMC Microbiology, Tero Ahola, 2009 → ..., United Kingdom

Peer review of manuscripts

Pekka Lappalainen ,

Reviewer, EMBO Journal, Pekka Lappalainen, 2005 → 2010

Reviewer, Journal of Biological Chemistry, Pekka Lappalainen, 2005

Reviewer, Journal of Cell Biology, Pekka Lappalainen, 2005 → 2010

Reviewer, Journal of Cell Science, Pekka Lappalainen, 2005 → 2010

Reviewer, Molecular Biology of the Cell, Pekka Lappalainen, 2005 → 2010

Reviewer, Molecular Cell, Pekka Lappalainen, 2005

Reviewer, Trends in Biochemical Sciences, Pekka Lappalainen, 2005

Reviewer, Biochemistry, Pekka Lappalainen, 2006

Reviewer, Current Biology, Pekka Lappalainen, 2006 → 2010

Reviewer, EMBO Reports, Pekka Lappalainen, 2006

Reviewer, Traffic, Pekka Lappalainen, 2006

Reviewer, Journal of Biological Chemistry, Pekka Lappalainen, 2007

Reviewer, Structure, Pekka Lappalainen, 2007

Reviewer, Molecular and Cellular Biology, Pekka Lappalainen, 01.01.2008 → 31.12.2008

Reviewer, Nature Reviews Molecular Cell Biology, Pekka Lappalainen, 01.01.2008 → 31.12.2008

Reviewer, PLoS One, Pekka Lappalainen, 2008

Reviewer, Proc. Natl. Acad. Sci., Pekka Lappalainen, 2008 → 2010

Reviewer, Protein Expression and Purification, Pekka Lappalainen, 2008

Reviewer, Science, Pekka Lappalainen, 2008

Reviewer, Trends in Cell Biology, Pekka Lappalainen, 2008

Reviewer, Journal of Biological Chemistry, Pekka Lappalainen, 2009

Reviewer, Nature Structural and Molecular Biology, Pekka Lappalainen, 2009

Reviewer, Trends in Cell Biology, Pekka Lappalainen, 2009

Reviewer, Nature, Pekka Lappalainen, 2010

Reviewer, Nature Cell Biology, Pekka Lappalainen, 2010

Eija Jokitalo ,



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

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

CellMolBiol/Lappalainen

Reviewer, Journal of Molecular Histology, Eija Jokitalo, 2005 → 2006

Reviewer, BMC Cell Biology, Eija Jokitalo, 2009

Ville Hietakangas ,

Reviewer, Acta Biochimica et Biophysica Sinica, Ville Hietakangas, 2010

Reviewer, PLoS ONE, Ville Hietakangas, 2010

Jussi Jääntti ,

Reviewer, Yeast, Jussi Jääntti, 2005

Reviewer, FEBS Letters, Jussi Jääntti, 2006

Reviewer, Journal of Molecular Biology and Biotechnology, Jussi Jääntti, 2007

Reviewer, Molecular Genetics and Genomics, Jussi Jääntti, 2007

Reviewer, BBA - Molecular Cell Research, Jussi Jääntti, 2008

Reviewer, BMC Cell Biology, Jussi Jääntti, 2008

Reviewer, Molecular Genetics and Genomics, Jussi Jääntti, 2008

Reviewer, PLoS One, Jussi Jääntti, 2008

Reviewer, Molecular Biology of the Cell, Jussi Jääntti, 2009 → 2010

Reviewer, Journal of Biological Chemistry, Jussi Jääntti, 2010

Reviewer, Molecular Genetics and Genomics, Jussi Jääntti, 2010

Claudio Rivera Baeza ,

Referee, Biochem. Biophys. Acta, Claudio Rivera Baeza, 2005 → 2010

Referee, Brain Research, Claudio Rivera Baeza, 2005 → 2010

Referee, European Journal of Neuroscience, Claudio Rivera Baeza, 2005 → 2010

Referee, J. Comp. Neurol, Claudio Rivera Baeza, 2005 → 2010

Referee, Journal of Neuroscience, Claudio Rivera Baeza, 2005 → 2010

Referee, Nat. Neuroscience, Claudio Rivera Baeza, 2005 → 2010

Referee, Neurochemistry, Claudio Rivera Baeza, 2005 → 2010

Referee, Trends in Neuropharmacology, Claudio Rivera Baeza, 2005 → 2010

Referee, Trends in Neuroscience, Claudio Rivera Baeza, 2005 → 2010

Maria Vartiainen ,

FEBS Letters, Maria Vartiainen, 2007

Experimental Cell Research, Maria Vartiainen, 2008

Journal of Molecular Biology, Maria Vartiainen, 2009

Cytoskeleton, Maria Vartiainen, 2010

PLOS Pathogens, Maria Vartiainen, 2010

Tero Ahola ,

Reviewer, Journal of Virology, Tero Ahola, 2005 → ..., United States

Reviewer, PNAS, Tero Ahola, 2005 → 2010, United States

Reviewer, Journal of General Virology, Tero Ahola, 2006 → 2009, United Kingdom

Reviewer, EMBO Journal, Tero Ahola, 2007 → 2009

Reviewer, Medicinal Res. Reviews, Tero Ahola, 2007 → 2009, Netherlands

Reviewer, Nature Reviews Microbiol, Tero Ahola, 2008, United Kingdom

Reviewer, Virus Research, Tero Ahola, 2009 → ..., United States



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

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

CellMolBiol/Lappalainen

Minna Poukkula ,

Toxicology and Applied Pharmacology, Minna Poukkula, 06.07.2010

Assessment of candidates for academic posts

Ville Hietakangas ,

Assessment of candidate for academic post, Ville Hietakangas, 2010

Jussi Jääntti ,

Reviewer for Adjunct professorship, Jussi Jääntti, 2006

Reviewer for Tenure position, Jussi Jääntti, 2007

Reviewer for Adjunct professorship, Jussi Jääntti, 2009

Tero Ahola ,

Referee for docentship, Tero Ahola, 2008

Referee for docentship, Tero Ahola, 2009

Membership or other role in review committee

Pekka Lappalainen ,

Reviewer of grant applications, National Science Foundation, Pekka Lappalainen, 2005

Reviewer of grant applications, Wellcome Trust (UK), Pekka Lappalainen, 2005

Reviewer of grant applications, Cancer Research UK, Pekka Lappalainen, 2007

Reviewer of grant applications, EMBO, Pekka Lappalainen, 2007

Reviewer of grant applications, Human Frontiers Science Program, Pekka Lappalainen, 2008

Reviewer of grant applications, Research Foundation - Flanders (Belgium), Pekka Lappalainen, 2008

Reviewer of grant applications, EMBO, Pekka Lappalainen, 2009

Eija Jokitalo ,

Cancer Research UK London Research Institute (United Kingdom), Electron microscope facility review, Eija Jokitalo, 2010

Ville Hietakangas ,

Referee of graduate school applicants, Ville Hietakangas, 2010

Reviewer, in science competition for high school students, Academy of Finland, Ville Hietakangas, 2010

Jussi Jääntti ,

Reviewer of grant application, Jussi Jääntti, 2007

Reviewer of grant application, Jussi Jääntti, 2008

Reviewer of grant application, Jussi Jääntti, 2010

Membership or other role in research network

Eija Jokitalo ,

Helsinki Functional Imaging Center, member, Eija Jokitalo, 2008 → ...

Chair of electron microscopy consortium, Biocenter Finland, Eija Jokitalo, 2009 → ...

Claudio Rivera Baeza ,

Member of American Neuroscience Society, Claudio Rivera Baeza, 1996 → ...

Member of FENS, Claudio Rivera Baeza, 2000 → ...

Member of Biocentrum Helsinki, Claudio Rivera Baeza, 2001 → 2010

Tero Ahola ,

Board member, Viikki research group organization in molecular biosciences, Tero Ahola, 2003 → ...



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

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

CellMolBiol/Lappalainen

Vice-chair of Viikki research group organization in molecular biosciences, Tero Ahola, 2009

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

Pekka Lappalainen ,

Member of the 'Cytoskeleton section', Pekka Lappalainen, 2005 → 2010

FWO Vlaanderen, Belgia, Pekka Lappalainen, 01.01.2008 → 31.12.2008, Belgium

Eija Jokitalo ,

The Board of the Viikki Graduate School in Biosciences, member, Eija Jokitalo, 2008 → ...

University of Helsinki Scientific Council Expert pool, member, Eija Jokitalo, 2008 → ...

Jussi Jääntti ,

Member of the Helsinki University Hospital Coordinating Ethical committee, Jussi Jääntti, 2005 → 2010

American Society of Cell Biology, Jussi Jääntti, 01.01.2008 → 31.12.2008

Chair of the Viikki Research Group organization, Jussi Jääntti, 2008 → 2010

Member of student selection committee, Jussi Jääntti, 2009

Tero Ahola ,

Member of Advisory board on biotechnology, Tero Ahola, 2004 → 2007

Bioalan rakenteellinen kehittäminen - toimikunnan sihteeri, Tero Ahola, 2008

Membership or other role in public Finnish or international organization

Claudio Rivera Baeza ,

Member of Finnish Brain Research Society, Claudio Rivera Baeza, 2000 → ...

Tero Ahola ,

Member of American Society for Microbiology, Tero Ahola, 2005 → ...

Member of American Society for Virology, Tero Ahola, 2005 → ...

Member of Societas Biochemica, Tero Ahola, 2005 → ...

Participation in interview for written media

Eija Jokitalo ,

YLE Teema (Radioattori), Eija Jokitalo, 2006, United States

Claudio Rivera Baeza ,

Claudio Rivera's research group discovered how the development of nerve connections is synchronised. But who is Rivera? ,HUB, Claudio Rivera Baeza, 2008

Helsingin Yliopisto Tiedelehti, Claudio Rivera Baeza, 01.01.2008 → 31.12.2011, Germany

Helsinki University WebPages, Claudio Rivera Baeza, 01.01.2008 → 31.12.2011, Germany

Vaurioituneet hermosolut saavat kehityksenaikaisia ominaisuuksia, Duodecim, Claudio Rivera Baeza, 2008

Participation in radio programme

Maria Vartiainen ,

YLE radioohjelma radiaattori, Maria Vartiainen, 2008, Sweden



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

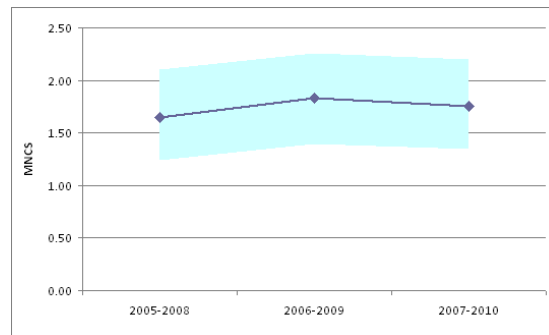
Web of Science(WoS)-based bibliometrics of the RC's publications data 1.1.2005-31.12.2010
by CWTS, Leiden University, the Netherlands

Research Group: Lappalainen P

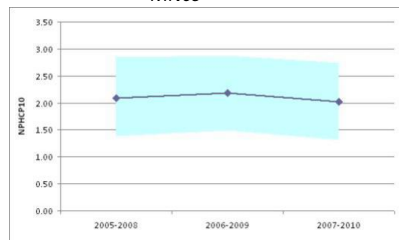
Basic statistics

Number of publications (P)	164
Number of citations (TCS)	2,445
Number of citations per publication (MCS)	14.97
Percentage of uncited publications	13%
Field-normalized number of citations per publication (MNCS)	1.63
Field-normalized average journal impact (MNJS)	1.49
Field-normalized proportion highly cited publications (top 10%)	1.85
Internal coverage	.94

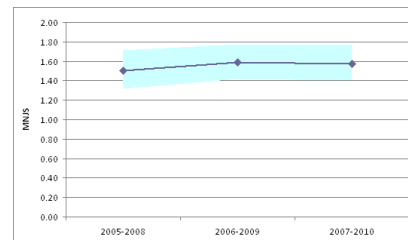
Trend analyses



MNCS

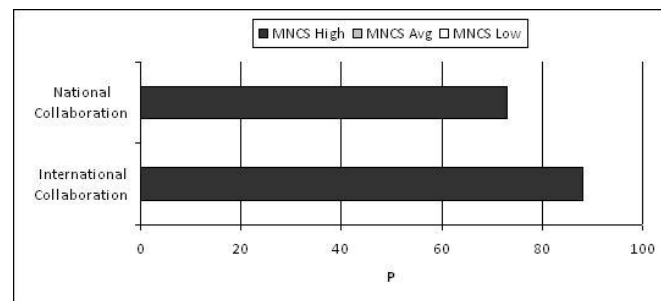


THCP10



MNJS

Collaboration



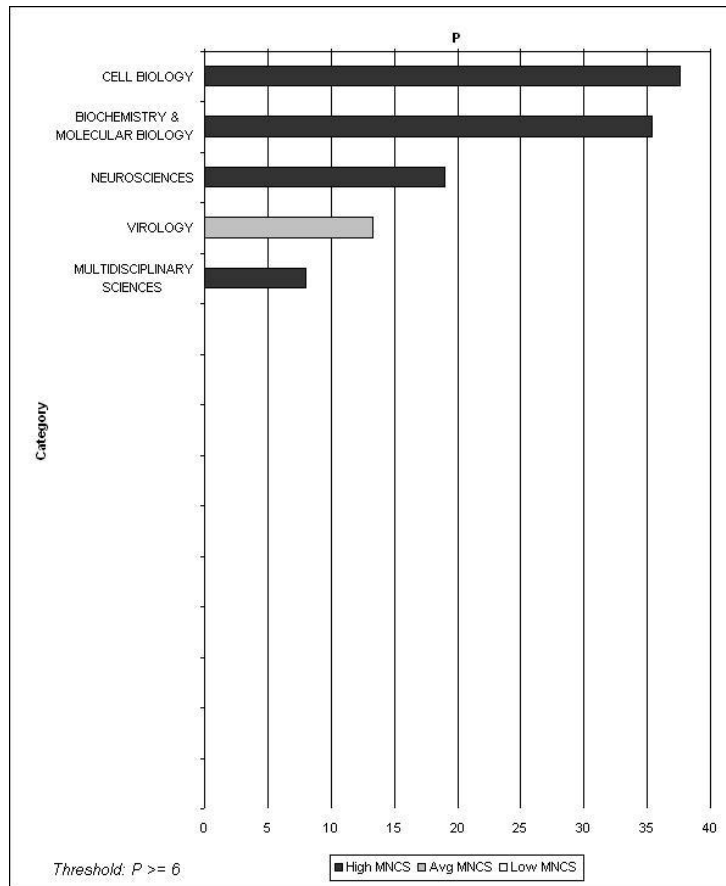
Performance (MNCS) by collaboration type



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

Web of Science(WoS)-based bibliometrics of the RC's publications data 1.1.2005-31.12.2010
by CWTS, Leiden University, the Netherlands

Research profile



University of Helsinki
Administrative Publications 80/11
Evaluations

ISBN 978-952-10-7431-8 (PDF)
ISSN 1795-5513 (Online)

Internet address:

http://www.helsinki.fi/julkaisut/aineisto/rc_evaluation2012/hallinnon_julkaisuja_80_11_2012.pdf



HELSINGIN YLIOPISTO
HELSINGFORS UNIVERSITET
UNIVERSITY OF HELSINKI