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

RC-Specific Evaluation of PHYTOPATH – Phytopathogen Research

Seppo Saari & Antti Moilanen (Eds.)
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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

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

RC's responsible person: Valkonen, Jari

Key words: plant pathology, forest pathology, mycology, bacteriology, virology, plant protection, forest protection, pathogen diagnostics, epidemiology, plant-pathogen interactions, molecular biology, genomics, biotechnology

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Foreword

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

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

This evaluation enabled researchers to define RCs from the “bottom up” and across disciplines. The aim of the evaluation was not to assess individual performance but a community with shared aims and researcher-training activities. The RCs were able to choose among five different categories that characterised the status and main aims of their research. The steering group considered the process of applying to participate in the evaluation to be important, which lead 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 Pyhältö
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 Kristilina 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 biochemistry
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 Molianen, Project Secretary, was responsible for editing the reports. He worked in the evaluation office from January 2012 to April 2012.

TUHAT OFFICE
Provision of the publication and other scientific activity data
Mrs Aija Kaitera, Project Manager of TUHAT-RIS served the project ex officio providing the evaluation project with the updated information from TUHAT-RIS. The TUHAT office assisted in mapping the publications with CWTS/University of Leiden.
MA Liisa Ekebom, Assisting Officer, served in TUHAT-RIS updating the publications for the evaluation. She also assisted the UH/Library analyses.
BA Liisa Jäppinen, Assisting Officer, served in TUHAT-RIS updating the publications for the evaluation.

HELSINKI UNIVERSITY LIBRARY
Provision of the publication analyses
Dr Maria Forsman, Chief Information Specialist in the Helsinki University Library, managed with her 10 colleagues the bibliometric analyses in humanities, social sciences and in other fields of sciences where CWTS analyses were not applicable.
Acronyms and abbreviations applied in the report

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

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

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

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

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

1.1 RC-specific evaluation reports

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

It is essential to emphasise that the evaluation combines both meta-evaluation\(^1\) 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.

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\(^1\) 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. TUHAT\(^3\) compilations on publications and other scientific activities\(^4\)
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 panelists as compared to the previous evaluations was the character of the evaluation as a meta-evaluation. The panelists 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.

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\(^3\) 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
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)**

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.

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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
3. External peer review May–September 2011
4. Published reports March–April 2012
   - University level public report
   - RC specific reports

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

1.9 Evaluation feedback – consensus of the entire panel

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

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

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

2.1 Focus and quality of the RC’s research

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

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

The RC deals with diseases of agric crops and woody plants. The base of the RC is to understand the biology of fungi, viruses and bacteria and their interactions with plants and trees.

The article publication record is outstanding taking into account the development in the permanent researcher resources. However, there is a marked decrease in 2010, and very little seems to be published in conference proceedings or reviewed conference papers.

The leader of the RC has won the five year Academy Professor position, a highly appreciated achievement in Finnish science. There are also other public recognitions given to the RC’s research.

The RC has developed into its current constellation over the past few years and development will continue, as a result of the Finland Distinguished Professor Programme (FIDiPro) project and other grants. The group is thus relatively young but very dynamic. The small size of the RC makes it flexible and collaboration within the group seems to be excellent. There is a lot of synergy among the projects, scientists and students, and also joint grants intensify the collaboration.

The RC presents high quality research and describes themselves as leaders in their field in Northern Europe. The RC has built in depth understanding on epidemiology and ecology of plant pathogens important in the Nordic countries, their interactions with the host plants and disease mechanisms. Also the funding situation of the RC is good and the funds come from various sources, of which many are highly competed.

The RC deals methodologically with a relatively wide research field (including virology, mycology, bacteriology, population biology) and with applications in both agriculture and forestry. Due to the relatively small number of PIs, it may be discussed if the group is able to have excellence all over the area. However, it seems by so far that the formulated targets have been achieved by using advanced methodological approaches (and more traditional ones), although the research is stronger in agricultural applications.

In general, the RC is a very successful competitor in their research field, and they also have a clear and target oriented strategy for continuous development and improvement.

**Numeric evaluation:** 4.5 (Excellent)

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.**
Recruitment procedures are good, open calls for students are more or less always to be preferred. The RC has generated a research environment which attracts students.

Supervising and follow-up of procedures are very good, meetings with PhD students every two to three weeks is a guarantee for effective work. The students have also a follow-up group and many of the students are enrolled in the national graduate schools.

Ten finalised theses are reported. It is strongly recommended that each student has always at least two supervisors, since also in the best of both worlds problems (not always of academic nature) can show up, both for supervisors and students, and thus a supervisor group is much more robust when compared to a single supervisor. Also a good supervisor makes mistakes sometimes.

The present number of PhD students is as high as 24 (the list even covers 29 names) laying a considerable pressure on the supervising persons.

The availability of graduate programmes is very good, just as the active organization of courses given by the RC’s PIs. Also the courses offered by European high quality courses in EMBO excellence in life sciences and the Federation of European Biochemical Societies (FEBS) are utilized.

Training in applying for travel and research grants is very good for the future wellbeing of the students. It seems as the PhD students themselves do not normally present their work at conferences and similar events, nothing is at least listed in the publication reports.

**Numeric evaluation:** 4 (Excellent)

### 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.**

The RC is the major academic unit responsible for the specialized higher education in their fields in Finland, which gives them an important role in agriculture and also in forestry. Some successful applied projects are introduced and good examples of collaboration with companies and farmers in the field are given, indicating significant practical impacts and economic benefits of the RC’s work.

Wide interactions with practical stakeholders, companies and organizations are also seen as an important way to find employment for graduates.

A bit more can be done to increase the societal impact and collaboration (this is also identified by the RC). Examples of this are a more intense student (and researcher) exchange with companies to find the practical problems, writing of more popular scientific papers and a better homepage. Exploitation of the research findings in the traditional sectors like pulp and paper should be evaluated.

The RC does not have IPR plans. This should be considered. For patenting, support from the university’s side is needed.

**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

Research collaboration is one of the RC’s strong areas. A large network including high quality researchers and organizations is described with names of persons and organizations in regard to both international and domestic collaboration. The group itself is international and many PhD candidates are from abroad.

Participation in international conferences for the PhD students is mentioned as very valuable, the very small number of conference publications of the RC is therefore somewhat difficult to understand.

The RC could participate in the EU programmes and networks (COST - European Cooperation in Science and Technology actions) as stated in the strategy plan of the RC.

**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

Operational conditions are in most cases good for the RC with many modern facilities and instruments. Field experiments can be handled at the University of Helsinki’s (UH’s) farms. Many research units use same type of equipment which makes it easier to keep them updated and probably also to build up information when optimally handled.

However, some facilities are unique for the RC and to find possibilities for specialized laboratories and growth chambers is of course important for the future.

A lot of time is used for administration and teaching, and a one lecturer vacancy is not making things better. Although overloading of personnel is a problem in most academic departments and not so easy to solve, one gets the impression that notion “in this respect, the working environment needs to be improved soonest” needs to be taken into account.

Some improvements can be reached if the organization of administrative work is done in a way which gives a minimal load to the professors.

The above is also related to the issue of sabbatical years (to reserve resources for a competent acting person to substitute one’s sabbatical leave) at the UH, raised also by other RCs.

### 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 RC is divided between two departments, which may cause problems, but it seems as if most things run quite smoothly with an increase in collaboration between the groups. And with special faculty funding for joint activities.

The leadership of the two departments and the role of the RC in the department structure are not so well described. A management group is planned. Yet the RC gives an impression of a coherent and functional group dealing with many related research questions. The RC seems in general to be flexible and easy to manage, maybe as a result of its relatively limited size.

Action is taken to further increase collaboration within the RC.

The common core area is well described.

A lot of things in the RC seem to be focused among the PIs. A recommendation may be to discuss strategies to make optimal use of the knowledge, innovations and ideas of all other RC members as well.

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 Academy of Finland is the major funder of RCs research. The RC is in general very competitive as an applicant for national grants. The rough estimate based on the given data for the evaluation period and including graduate (doctoral) school placements is as high as 14 MEUR for a group not so large when measured by the number of senior members.

Except for some grants from Sweden, small grants are collected from international sources and almost none from the EU. A large international network is described, but it seems as if it is not (so far) used as a base for international applications, which is somewhat surprising.

Especially for EU money, a strategy for increased actions with active work to find optimal networks including experienced coordinators etc is recommended.

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 action plan is closely connected to the new FiDiPro project with research both on improved bioinformatic methods (including user-friendly software) and applications. The methodologies to be developed and described in the strategy are well chosen and represent future needs.

Also the goal to develop a Centre of Excellence in Phytopathogen Research with the means of the Center of Excellence Programme funded by the Academy of Finland indicates a forward looking ambitious spirit of the RC. The RC should strongly pursue towards it.

Research in order to decrease the use of chemical pesticides is mentioned just as collaboration in general with other agricultural research sectors. With increased pressure from the society to find long term sustainable food production systems, this is a very interesting task with high societal value.
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 indicated that they belong to category 1 ‘The research of the participating community represents the international cutting edge in its field’.

This is the correct category, the research is of high quality and the focus of the RC is both in basic research as well as on research findings having practical economic benefits and thus societal impacts.

Numeric evaluation: 4 (Excellent)

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

Material is developed by the PIs alone.

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

Focus area 2: The basic structure of life

The RC’s research is well connected to ‘Basic structure of life’ but also the ‘Welfare and safety’ area, including safe and sustainable food production.

2.12 RC-specific main recommendations

The methodologies to be developed and described in the strategy are well chosen and represent future needs. Also to develop a Centre of Excellence in Phytopathogen research is a good and reachable goal for the future.

Some more detailed recommendations:
- More can be done to increase societal impact and collaboration.
- Increase the amount of conference publications of the RC.
- It is recommended that each student has always at least two supervisors.
- The RC is in general very competitive as an applicant for national grants. However, for international grants and especially for EU money, a strategy for increased actions with active work to find optimal networks including experienced coordinators etc is recommended.

2.13 RC-specific conclusions

In general, the RC is a very successful competitor in their research field, and they also have a clear and target oriented strategy for continuous development and improvement.
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:
Phytopathogen Research (PHYTOPATH)

LEADER OF THE RESEARCHER COMMUNITY:
Academy Professor Jari Valkonen, Department of Agricultural Sciences, Faculty of Agriculture and Forestry

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’ other scientific activities 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)
Name: Valkonen, Jari
E-mail:
Phone: 09-19158387
Affiliation: Department of Agricultural Sciences, University of Helsinki
Street address: Latokartanonkaari 7-9, Viikki

**Description of the participating researcher community (RC)**

Name of the participating RC (max. 30 characters): Phytopathogen Research

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

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 Phytopathogen Research Consortium (PHYTOPATH) deals with education and research on biotic and abiotic diseases of agricultural crops and woody plants. As a science, it is dedicated to understanding the biology of fungi, viruses and bacteria and their pathogenic interactions with crop plants and forest trees. The primary mission is for the training of students at MSc and doctoral levels in phytopathology as the only academic unit in Finland. The graduates obtain multidisciplinary skills in applied and basic sciences, as relevant for integrated and environmentally sustainable management of diseases, and assume careers in agriculture, forestry, biology and associated industries in Finland and abroad. Our RC has developed favourably over the recent years and comprises expertise in all key areas of plant/tree–microbe interactions, including plant virology, mycology, bacteriology, population biology, and also extension. We have joint forces of our various disciplines for the purpose of providing high level graduate training for the benefit of our doctoral students. The twenty-first century promises to be the century of the biologist, in particular biotechnology and its allied fields of genomics, proteomics and bioinformatics. Integrating information across many sub-disciplines of biology including plant and forest pathology is increasingly becoming important for research and teaching. With increasing amount of genome sequence information, comparisons of the genomes will provide an understanding of the evolution of harmful and beneficial microbes, particularly as they evolve in association with plants or trees. Our research community consortia team, therefore, is very much aware of this development and do possess the necessary skill and expertise to impact such knowledge, meet the potential needs of students, and respond the demands of society on food security and sustainable use of renewable natural resources.

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

**RC’s scientific subfield 1**: Agriculture, Multidisciplinary

**RC’s scientific subfield 2**: Forestry
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 1 MATERIAL (registration form)

RC’s scientific subfield 3: Virology
RC’s scientific subfield 4: Biotechnology and Applied Microbiology

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): Several lines of evidence suggest that the PHYTOPATH RC represents international cutting edge in its field. The RC has grown over the past few years based on careful recruitment of principal investigators, postdoctoral scientists and PhD students. A total of 18 scientists with a PhD degree and 30 PhD students have worked in PHYTOPATH since 2005. It is a large plant and forest pathology RC in the Scandinavian context covering all main research areas (mycology, bacteriology and virology). At the national level, PHYTOPATH appears highly competitive on research funding from the major donors. All research areas are funded via major grants from the Academy of Finland, the most competitive national source for basic research. One of the PIs holds an Academy Professor position, one of the 40 time-limited positions that can be applied for 5 years by senior researchers from any field of science. PHYTOPATH has won recently a large grant from the Finland Distinguished Professor (FiDiPro) program for establishing a Comparative Genomics Platform on Fungal Pathobiology oriented towards bioinformatics of fungal genomes. Applied research is funded by the Finnish Technology Agency Tekes and the Ministry of Agriculture and Forestry, including tight co-operation and funding also from private sector. The scientists and projects of the RC are internationally recognized and networked with laboratories carrying out cutting-edge research in Europe, North America and Asia. PHYTOPATH has long-term collaboration with developing countries on human capacity building in research and research training, funded by the Ministry for Foreign Affairs of Finland and other donors in EU. The RC has published 117 scientific papers in peer-reviewed journals since 2005, including 44 and 4 papers in medium (3-9) and high (>9) impact journals, respectively. Scientific productivity and quality of PHYTOPATH is expected to increase in the years to come and allow holding its position at a cutting edge of its field.

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): In providing joint graduate research training and education, our major targets have been

1. Phytopathogen biology: high level research in the area of ecology, genomics and systematics of fungi, bacteria and viruses; 2. Tree/plant – microbe interactions: special focus on molecular biology of the interactions between microbes and crop plants or forest trees, and molecular mechanisms of pathogen defense; 3. Extension services: in co-operation with the Finnish Forest Research Institute (METLA) and MTT AgriFood Research Finland, strive to provide an integrated management of forest tree diseases and diseases of field crops; 4. NOVA/BOVA, NordForsk and ScanBalt: with other Nordic and Baltic Sea region countries to organize PhD courses in plant and forest pathology and plant-microbe interactions, to enhance research training and regional networking within the related research areas; 5. Global/International outreach: to provide research training for human capacity building in East Africa and Nicaragua; 6. Seminars: to enhance analytical view on science in regular group meetings and journal clubs of the RC, to
participate actively in the Virus Club and Plant Club activities of the Viikki Biocenter Research Organization;
7. Graduate Schools (Doctoral Training Programmes): to encourage PhD students to seek for positions and participate in activities of the graduate schools (VGSB, FGSPB, GPBM), to contribute to the graduate programmes by organising intensive PhD courses and providing leadership in the graduate school management. Besides the main supervisor, most students have one or two co-supervisors. All PhD students have a follow-up group that supports the student and provides constructive feedback on progress annually.

Significance of the RC’s research and doctoral training for the University of Helsinki (MAX. 2200 characters with spaces):
PHYTOPATH is the only academic unit responsible for higher education in forest and plant pathology in Finland. It provides unique research training which is of demand in research institutes and private sector in Finland and abroad. University of Helsinki (UH) is responsible for higher education in agricultural and forest sciences by large, which requires plant and forest pathology as essential components; agricultural and forest sciences would be incomplete and lack an essential component without the PHYTOPATH. Owing to the active research training, the high quality and productivity in scientific publishing, co-operation with private sector, and active communication of the results of research to the society, PHYTOPATH is a strong component of UH. Evidence indicates that PHYTOPATH contributes to the outspoken goals of UH in excellence of science and research training, internationalization of the research community, and works according to the strategies of UH in interaction with the society. PHYTOPATH’s success in attracting substantial amounts of external research funding is of economic significance to UH. Via its activities, PHYTOPATH enhances both theoretical and methodological expertise of UH especially in life sciences, and will contribute increasingly to interdisciplinary approaches via collaboration with the RCs devoted to bioinformatics and computer science at UH. PHYTOPATH continues to renew science by seeking breakthroughs at interdisciplinary border areas, of which the latest example is establishment of the Comparative Genomics Platform on Fungal Pathobiology, which will benefit many RCs at UH, Finland and abroad. Taken together, PHYTOPATH will continue to provide unique profile to UH nationally and internationally, forms a strong link between UH and the society, and contributes to the goals of UH as one of the leading research universities (LERU) of Europe.

Keywords: plant pathology, forest pathology, mycology, bacteriology, virology, plant protection, forest protection, pathogen diagnostics, epidemiology, plant-pathogen interactions, molecular biology, genomics, biotechnology

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): PHYTOPATH carries out high quality research based on the latest research methods, such as genome sequencing, proteomics and genomics, and also the more traditional but necessary methods for studies on epidemiology and ecology of the pathogens, their interaction with host plants, and disease management. The results of PHYTOPATH have been outstanding. Excellence of the PIs is recognized by donors and evidenced by highly competitive research grants. One of the PIs obtained the main international prize of the research field in 2005. During the time span of the evaluation, 117 papers have been published in international peer reviewed journals (high citation index >9, 4 papers; medium to high citation index 3-9, 44 papers). The remaining papers published in applied journals are also important contributions directed to experts in extension and administration and to the practicing
agriculturalists and foresters. The excellent research of PHYTOPATH is reflected in the quality of doctoral training. Most of the students have obtained positions in graduate schools, mainly those focused on molecular biosciences (VGSB), molecular plant biology (FGSPB) and biotechnology (GPBM), which improves the quality of PhD education because students have access to high-quality courses tailored according to their needs and get networked with their peers. All PhD students are supervised and monitored frequently by a follow-up group (professor, supervisor(s) and two external experts). The PhD students take actively part in international high-quality training courses (e.g. FEBS and EMBO courses) and attend international congresses in plant and forest pathology, virology, plant-microbe interactions, etc. Members of PHYTOPATH participate in Nordic and Baltic Sea region PhD training networks providing valuable contacts for the future career. During the time span of the evaluation, 10 PhD students have graduated from PHYTOPATH and two PhD theses were “approved with distinction”, the highest PhD thesis grading granted by the Faculty of Agriculture and Forestry for the top 10% of the students. Currently, 24 PhD students are carrying out their postgraduate studies in PHYTOPATH.

Comments on how the RC’s scientific productivity and doctoral training should be evaluated (MAX. 2200 characters with spaces): It is important to recognize the broad responsibilities of PHYTOPATH, including training plant and forest pathologists for Finland and other countries as the only academic unit in the country, and carrying out cutting-edge research at international level in basic and applied science in the respective fields. Plant and forest pathology are interdisciplinary, problem-based sciences combining plant science and microbiology, basic sciences and applied research, which should also be recognized. Excellence in the study field of PHYTOPATH is achieved via optimal balancing of all these aspects. Participatory approach with private sector in applied research, and the human capacity building activities with developing countries are demanding and characteristic of PHYTOPATH. This RC has been developed, in a goal-minded manner, to its current constellation only over the past few years, and further developments are on-going. PHYTOPATH is a dynamic RC oriented towards further development in research and research training.

PHYTOPATH aims to publish results of basic science-oriented research in the highest-impact journals. Since 2005, 4 papers were published in high-impact journals such as Proceedings of the National Academy of Sciences of the USA (2 papers), The Plant Cell and Trends in Plant Science (citation index >9), and as many as 44 papers were published in leading journals of more species fields (e.g., Journal of Virology, Molecular Plant pathology). Important results of applied significance, e.g., on new pathogens and strains, developments in pathogen diagnostics, or novel means for disease control, are published in journals directed to experts in extension and administration and to the practicing agriculturalists and foresters. PHYTOPATH’s strategy is to inform the public and agricultural and forestry sectors by popularizing results via the national agricultural and forestry magazines (ca. 10 articles are published per year). Close research collaboration with companies, agricultural and forestry research institutes and other actors of the sectors facilitates rapid dissemination of information and results to practice, which increases the RC’s impact in the society.
### List of RC Members

**NAME OF THE RESEARCHER COMMUNITY:** PHYTOPATHOGEN RESEARCH  
**RC-LEADER:** J. Valkonen

<table>
<thead>
<tr>
<th>Last name</th>
<th>First name</th>
<th>PI-status (TUHAT, 29.11.2010)</th>
<th>Title of research and teaching personnel</th>
<th>Affiliation</th>
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<tr>
<td>1</td>
<td>Asiegbu</td>
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<td>Kasanen</td>
<td>Risto</td>
<td>University lecturer</td>
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<td>Pasonen</td>
<td>Hanna</td>
<td>Senior scientist</td>
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<td>Lehr</td>
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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: Valkonen, Jari

E-mail of the RC’s responsible person:

Name and acronym of the participating RC: The Phytopathogen Research Consortium, PHYTOPATH

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 focus area "Basic structure of life" includes virology, genome research, studies on evolution and genetics, signalling in organisms, and research on diseases, which all are central areas of basic research in PHYTOPATH.

From the applied point-of-view, our research is focused on natural resources including plants and forests and their health. In addition, some aspects of virology are considered as a part of nanosciences. Therefore, the focus area "The basic structure, materials and natural resources of the physical world" is relevant to PHYTOPATH.

Bioinformatics is an essential component in the genomics, proteomics, metabolomics, etc. –omics oriented research done and developed in PHYTOPATH, which makes also the focus area “Exact thinking” relevant.

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

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

The Phytopathogen Research Consortium (PHYTOPATH) deals with education and research on biotic and abiotic diseases of agricultural crops and woody plants. As a science, it is dedicated to understanding the biology of fungi, viruses and bacteria and their pathogenic interactions with crop plants and forest trees. The primary mission is for the training of students at MSc and doctoral levels in phytopathology as the only academic unit in Finland. We have joint forces of our various disciplines for the purpose of providing high level graduate training for the benefit of our doctoral students. The graduates obtain multidisciplinary skills in applied and basic sciences, as relevant for integrated and environmentally sustainable management of diseases, and assume careers in agriculture, forestry, biology and associated industries in Finland and abroad.

Our RC has developed favourably over the recent years and comprises expertise in all key areas of plant/tree–microbe interactions, including plant virology, mycology, bacteriology, population biology, and also extension. Our major targets have been 1.) Basic research on phytopathogen biology: high level research in the area of ecology, genomics and systematics of fungi, bacteria and viruses; 2.) Tree/plant – microbe interactions: special focus on molecular biology of the interactions between microbes and crop plants or forest trees, and molecular mechanisms of pathogen defense; and 3.) Extension in co-operation with the Finnish Forest Research Institute (METLA) and MTT AgriFood Research Finland, strive to provide an integrated management of forest tree diseases and diseases of field crops.

PHYTOPATH carries out high quality research based on the latest research methods, such as genome sequencing, proteomics and genomics, and also the more traditional but necessary methods for studies on epidemiology and ecology of the pathogens, their interaction with host plants, and disease
management. The results of PHYTOPATH have been outstanding. The PIs are the leading scientists in
their respective research fields in northern Europe. Excellence of the PIs is recognized by donors and
evidenced by substantial amounts of highly competitive research grants available to the PIs during the
evaluation period (2005-2010). One of the PIs (JV) obtained the main international prize of the research
field in 2005 (Richard Francki Prize in Plant Virology) and a position as an Academy Professor at the
Academy of Finland (2006-2011). Two of the PIs (FA & JV) won a major grant from the Finland
Distinguished Professor (FiDiPro) programme of the Academy of Finland in 2010, which provides unique
possibilities to develop the area of pathobiology-oriented bioinformatics. One PI (MP) has been the
leading figure in projects characterizing genome sequences of new soft rot bacteria of potato and their
virulence mechanisms. RK has written a new textbook needed for teaching. During the time span of the
evaluation, 117 papers have been published in international peer reviewed journals (4 papers with high
citation index >9 in PNAS (x2), Plant Cell and Trends in Plant Science; 44 papers with medium to high
citation index 3-9). The remaining scientific papers published in applied journals are also important
contributions directed to experts in extension and administration and to the practicing agriculturalists
and foresters.

It is a strength of the RC that its research is focused on the most important pathogens of crop plants and
forests, especially those relevant to northern Europe. The 21st century promises to be the century of
the biologist, including biotechnology and its allied fields of genomics, proteomics and bioinformatics,
and biology-driven solutions for crop and forest protection. Integrating information across many sub-
disciplines of biology including plant and forest pathology is increasingly becoming important for
research and teaching. With increasing amount of genome sequence information, comparisons of the
genomes will provide an understanding of the evolution of harmful and beneficial microbes, particularly
as they evolve in association with plants or trees. Our research community consortia team, therefore, is
very much aware of this development and do possess the necessary skill and expertise to impact such
knowledge, meet the potential needs of students, and respond the demands of society on food security
and sustainable use of renewable natural resources.

Owing to the active research training, the high quality and productivity in scientific publishing, co-
operation with private sector, and active communication of the results of research to the society,
PHYTOPATH is a strong component of UH and the scientific community. Evidence indicates that
PHYTOPATH contributes to the outspoken goals of UH in excellence of science and research training,
internationalization of the research community, and works according to the strategies of UH in
interaction with the society. PHYTOPATH’s success in attracting substantial amounts of external
research funding is of economic significance to UH. Via its activities, PHYTOPATH enhances both
theoretical and methodological expertise of UH especially in life sciences, and will contribute
increasingly to interdisciplinary approaches via collaboration with the RCs devoted to bioinformatics and
compuler science at UH. The FiDiPro project will benefit many RCs at UH, Finland and abroad.

Taken together, PHYTOPATH will continue to provide unique profile to UH nationally and internationally,
forms a strong link between UH and the society, and contributes to the goals of UH as one of the leading
research universities (LERU) of Europe.

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

PHYTOPATH continues to renew science by seeking breakthroughs at interdisciplinary border areas, of
which the latest example is establishment of the FiDiPro project oriented towards bioinformatics of
fungal, bacterial and viral genomes. It provides great opportunities to advance our science and
consolidate our research collaborative effort. While it provides the core for activities, additional
research grants will be needed to fully measure out the impact of FiDiPro. PHYTOPATH will aim to
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 2 MATERIAL

deeper understanding of the molecular mechanisms of pathogen virulence and host resistance, enhanced by development of model systems, such as the model moss (Physcomitrella patens) applicable to the pathosystems used in PHYTOPATH. Pathogenesis and resistance mechanisms regulated at the RNA level in hosts and pathogens will provide another synergistic research area within PHYTOPATH. The ways for improving quality include regular group meetings and journal clubs of the RC to enhance analytical view on science, and the Virus Club and Plant Club activities of the Viikki Biocenter Research Organization.

2 PRACTICES 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.

Doctoral students are recruited by open, international or national calls or, occasionally, by employing the best students who have worked for their MSc theses in PHYTOPATH. The gender issue is also considered in recruitment when two applicants have similar qualifications. Currently, 24 PhD students (14 female, 10 male) are carrying out their doctoral studies in PHYTOPATH.

The guidelines and good practises decided by the Faculty, University, and graduate programmes funded by the Ministry of Education via the Academy of Finland, are being followed. According to these guidelines, all PhD students have a main supervisor, and also a co-supervisor when needed to broaden the expertise relevant to the PhD research project. Students’ progress is monitored frequently (at least once a year) by a follow-up group (professor of the main subject, supervisor(s) and two external experts). However, besides following these formal guidelines, it is customary in PHYTOPATH for the supervisors to have regular meetings with each PhD student once in 2 or 3 weeks, and also otherwise when needed. These meetings are useful to ensure that no problems have time to accumulate, and because the new results can be freshly analyzed, their influence on the next steps of experimentation considered without delay, and necessary changes in plans made. As part of the formal employment policies of the University, the supervisor has a formal, confidential development and feedback discussion with the PhD student once a year, and results will be implemented.

Several students of PHYTOPATH are involved in projects that are carried out in collaboration between two departments or faculties of the University, between two universities, or between the University and one of the sector research institutes. Examples within University of Helsinki include Depts. of Agricultural Sciences and Forest Sciences linked by PHYTOPATH within the Faculty of Agriculture and Forestry; collaboration of PHYTOPATH with the Faculty of Veterinary Medicine (pathogen diagnostics and virology), Faculty of Biosciences and Environment (bacterial genomics) and Institute of Biotechnology (structural biology and genomics). Jointly supervised doctoral students with METLA, MTT, Swedish University of Agricultural Sciences, or Makerere University (Uganda) are additional examples. These students form a strong link between the units and organisations involved, and have supervisors in both. Frequent meetings with the supervisors ensure that the students are integrated in both collaborating units.

Most of the students are members in graduate programmes, mainly those focused on molecular biosciences (VGSB), molecular plant biology (FGSPB) and biotechnology (GPBM). These memberships have been gained via highly competitive calls for applications, which is one measure of the quality of PhD students in PHYTOPATH. Membership in the graduate programme improves the quality of PhD
education by providing access to high-quality courses tailored for PhD students and networking the students with their peers from different faculties and research areas. PhD students of PHYTOPATH take actively part in international, high-quality training courses (e.g. FEBS and EMBO courses) and attend international congresses in plant and forest pathology, virology, plant-microbe interactions, etc., which they are strongly encouraged for. Students of PHYTOPATH also participate in Nordic and Baltic Sea region PhD training networks that provide valuable contacts for future career.

The PIs of PHYTOPATH are strongly involved in organising courses for PhD students regularly. One of the PIs (JV) is the vice director of the VG5B graduate programme and responsible for the virology education. All PIs have organised Nordic and Baltic Sea region courses for postgraduate students under the NOVA and BOVA University Networks. Furthermore, PHYTOPATH is involved in the global/international outreach by providing research training for human capacity building in East Africa and Nicaragua.

The excellent research of PHYTOPATH is reflected in the quality of doctoral training. Among the 10 PhD students who graduated in PHYTOPATH within the time span of this evaluation, two PhD theses were “approved with distinction”, the highest PhD thesis grading granted by the Faculty of Agriculture and Forestry for the top 10% of the students.

During their studies, all PhD students participate in teaching and are encouraged to take a basic course in pedagogy. They also actively apply travel and research grants. These skills give them good merits to continue as postdoctoral researchers and assume teaching positions at universities later in their career. All graduated PHYTOPATH students have been very successful in obtaining jobs either at universities or in private sector in their own country or abroad. These fresh doctors work all in research tasks at research institutes in Finland or abroad (e.g., France, Sweden, Peru, Uganda) or in private sector.

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

One strength of the RC is the high quality of the research, which attracts reasonable high numbers of students so that the best candidates can be chosen. The aspirations for continuous renewal of science, and adoption of the latest research techniques attracts students. Strong involvement in graduate programmes makes our PhD students privileged in terms of access to highly qualified courses on the most modern methods. Research in PHYTOPATH is interdisciplinary, which makes the students appreciate different skills and study fields, and provides them with good job opportunities. We are aware of the demands of the younger generation and work to satisfy their expectations. Challenges include likely reduction in funding for PhD students in future, salary levels which may not be competitive as compared to other careers, and private (partially financial) reasons sometimes limiting willingness to travel abroad for learning new techniques and skills in practise. There is a high demand to the expertise provided by PHYTOPATH in our society and abroad. The financial obstacles should be solved.

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

PHYTOPATH is the only academic unit responsible for higher education in forest and plant pathology and plant virology in Finland. The PIs have therefore a clear mission to provide unique research training which is of demand in research institutes and private sector in Finland and abroad. UH is responsible for higher education in agricultural and forest sciences by large, which requires plant and forest pathology as essential components; agricultural and forest sciences would be incomplete and lack an essential component without the PHYTOPATH.
The results of PHYTOPATH are used by many industries including forestry cluster, tree & plant breeding, agrochemical industry, and biotechnology companies. Applied projects are often carried out jointly with sector research institutes (METLA, MTT) and many companies. For example, PHYTOPATH has led research projects involving the whole Finnish potato sector to solve the most damaging disease problems such as those caused by soft rot bacteria, Rhizoctonia solani, Potato virus Y (PVY) and Potato mop-top virus (PMTV) to save the quickly developing, export-oriented Finnish seed potato business from an economical collapse. The project on PMTV covered the whole Baltic Sea region. Studies on R. solani were of particularly broad interest in the private sector and were funded by 17 private enterprises (and Ministry of Agric. and Forestry). Project meetings held at 6-months intervals over 4 years were all attended by 20-40 experts from farmers and company representatives to researchers and governmental officers. Besides scientific papers, the outcome was a well-educated potato sector provided with an outline how to control the disease. Concerning forest-related problems, the biotechnology company Verdera supports field trials on biocontrol of the root and butt rot fungus (Heterobasidion annosum) for which a hybrid strain of the ROTSTOP agent (Phlebiopsis gigantea) was developed by PHYTOPATH. H. annosum is the economically most harmful forest pathogen, causing economic losses of ca. 2 million euro per day to the forest owners in terms of loss of forest tree growth and quality of timber in Europe.

PHYTOPATH involves students in applied projects and organizes visits for them to forest and agricultural companies and the agricultural and forestry advisory centres to provide direct contacts with stakeholders that are potential employers of the students. Besides direct contacts and interactions with farmers and forest owners, communication of research results to the public is addressed though writing popular science articles in Finnish journals, arranging public seminars annually, and granting interviews to journalists. We have realized that such an outreach programme helps to provide a foundation that will nurture young people wishing to take up the challenge of making a career in modern plant and forest pathology.

Human capacity building and research projects carried out by PHYTOPATH in East Africa and Nicaragua have a great societal impact on food security and subsistence agriculture. The projects have laid foundation to use of biotechnological methods in pathogen diagnostics and disease management. In Nicaragua, the first plant breeding and healthy seed programmes have been initiated in the joint programm

**Ways to strengthen the societal impact of the RC’s research and doctoral training.**

We aim to increase involvement of private companies and representatives of the private sector and farmers in the formulation of new research projects and research applications to enhance the societal impact. Students working in the projects will get acquainted with the practical problems, which may help them in obtaining jobs within the sector after graduation. The interactions will also allow students to bring their knowledge and skills to the use of the sector. Writing more popular science papers would help the society understand the importance of knowledge advanced by PHYTOPATH. It is also important to create a joint homepage platform for PHYTOPATH. Renewal of the homepage platform of UH has delayed the process, but the homepage is now under construction as part of the recently launched FiDiPro project. Interactive media, e.g., educative videos and blogs at the homepage, could make information easily accessible.
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.

PHYTOPATH has a global network of collaborators and exclusive quotation is not possible within space provided. The network has been used effectively to facilitate mentorship and supervision of graduate students. Participation in international scientific conferences by the PhD students, and involving the international collaborators as teachers in courses for PhD students in Finland and abroad has added value to the international collaborative research network. To mention examples, it includes USA (Prof. R. Dean, North Carolina State Univ.; Prof. G. Dean, Georgia Inst. Technol.; Dr. S. Whitham, Ohio State Univ.), Canada (Dr. A. Wang, AgriFood Canada; Prof. C. Beualieu at Sherbrooke Univ.), Peru (Dr. J. Kreuze, Intern. Potato Center CIP), Nicaragua (Dr. A. Rojas, INTA), Sweden (Prof. J. Stenlid, Prof. H. Ronne, Dr. A. Kvarnheden, Prof. D. Funck Jensen, SLU), Norway (Dr. C. Spetz, Dr. M.B. Brorberg, Bioforsk), Denmark (Dr. K. Lehman Nielsen, Aalborg Univ.), United Kingdom (Prof. S. Gurr, Oxford Univ.; Dr. S. Kamoun, Sainsbury Laboratory; Prof. R. Wilson Jackson, Univ. Reading; Dr. I. Toth, SCRI), Netherlands (Prof. R. Visser, Dr. J. van der Wolf, Plant Res. Intern.), Germany (Dr. C. Gebhardt, Max-Planck-Instit.; Prof. I. Broer, Univ. Rostock), Estonia (Dr. A. Mäe, Univ. Tartu), Russia (Academician Prof. I. Tikhonovich, ARRIAM), Uganda (Dr. S. Mukasa, Dr. A. Tugume, Makerere Univ.), Tanzania (Dr. A. Kullaya, Dr. F. Taibo, ARI-Mikocheni), South Korea (Prof. Y.H. Lee, Seoul National Univ.), Taiwan (Dr. N.C. Lin, Nat. Taiwan Univ.), China (Prof. X. Li, Shandong Agric. Univ; Prof. D. Guo, Wuhan Univ.), and Japan (Prof. M. Akita, Kinki Univ.; Prof. K. Watanabe, Univ. Tsukuba). Our students have gained training in genomics, bioinformatics, microarray studies, imaging techniques etc. through short term visits to those laboratories. In turn, PHYTOPATH has had visiting PhD students and postdocs from the collaborating laboratories. Mobility was supported by research grants at either side, travel grants applied by the students, and by grants from CIMO and graduate programs.

Inter-sectoral collaboration in Finland was largely described in chapter 3. PHYTOPATH collaborates closely with METLA and MTT, incl. supervision of doctoral students in these institutes. One of the PIs (RK) employed at UH works part-time at METLA. Research in collaboration with J. Hantula and T. Pennanen concerns control of forest pathogens and studies on ectomycorrhizal fungi, respectively. With MTT, collaboration deals with studies on potato diseases (A. Hannukkala, E. Virtanen, L. Hiltunen, Y. Degefu). Disease management in horticultural crops is studied with Univ. Eastern Finland, Kuopio (H. Kokko and S. Kärenlampi), ProAgria Advisory Centre (K. Kostamo) and Ruralia Inst. (S. livonen, H. Avikainen). Collaboration within UH is lively but cannot be specified in lack of space. Interactions with the Dept. Computer Science (E. Ukkonen, V. Mäkinen) in bioinformatics and MSc education; Inst. Biotechnology (S. Butcher, A. Goldman, P. Auvinen, J. Jäntti, M. Saarma) on structural biology, genome sequencing and use of non-plant model organisms; and Dept. Biosciences (T. Palva, L. Holm, S. Taira) on bacterial genomics are emphasized owing to their importance.

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

The wide and active international collaborative network of PHYTOPATH is a great strength in research and training activities. It is important to have a dialogue with donors about means needed to facilitate international mobility. Sufficient financial support should be included in grants to allow families travel and settle abroad with the scientist. This will also be an important issue for possibilities to attract foreign scientist to visit PHYTOPATH or for the PIs to visit collaborating laboratories for any longer periods of time. Some of the funding tools for senior scientists have been discontinued recently. Donors
should design more calls for research grants that could be applied jointly by Finnish and foreign
laboratory each from the respective country; these opportunities are largely limited to EU countries. At
University of Helsinki, administration is not yet fully comfortable in using English. Many pieces of
important information are not readily accessible to foreigners, which makes the work during longer
visits complicated.

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).

PHYTOPATH members share the same laboratory facilities affiliated at the Faculty of Agriculture and
Forestry which together with the faculties of Biosciences and Environmental Sciences, Pharmacy, and
Veterinary Medicine, as well as the Institute of Biotechnology, are located at the Viikki Campus of Life
Sciences. The campus is one of the largest multidisciplinary research and education centres in Europe
affiliating over 2000 scientists and 6000 students. The academic units in the campus share many latest
state-of-art core facilities for high throughput sequencing, protein chemistry and proteomics,
metabolomics, protein crystallization, structural biology (NMR), light and electron microscopy, and new
GMO-safe research greenhouses and growth chambers. The buildings in the campus have been built or
thoroughly renovated since 1995 to correspond to the contemporary needs for qualified research and
education. Location in the same campus allows close collaboration with researchers of the Finnish
Center of Excellence in Plant Signalling Research, Finnish Center of Excellence in Virus Research, and
Finnish Center of Excellence in Microbial Food Safety Research. The farm of UH provides space and
machinery for field experiments.

The PIs of PHYTOPATH are all responsible for basic (BSc and MSc) courses and education programmes in
plant pathology, plant virology or forest pathology, which together with administrative tasks takes most
of the working time. There are five permanent teaching positions (professor and two university lecturers
in plant pathology, and professor and university lecturer in forest pathology). The three teaching
positions in plant pathology are oriented to plant virology, applied bacteriology and applied mycology,
respectively. The univ.lecturer position in applied mycology is vacant at the moment, and suitable
candidates are sought in parallel with recruitment of postdoctoral staff for the FiDiPro project. There is a
clear unbalance between the teaching and administrative tasks vs. research and research training. It is
difficult to have the time to provide qualified supervision also to PhD students and run competitive
research programmes, unless working time is extended to evenings and weekends. In this respect, the
working environment needs to be improved soonest.

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

Research facilities and equipment available to PHYTOPATH are modern, but they need to be updated or
replaced after a time. It is a strength that many research units use similar experimental approaches and
equipment, which allows making campus-wide joint applications when new equipment are needed.
However, PHYTOPATH requires experimental conditions where the spread of pathogens can be
controlled safely and growth conditions adjusted carefully. Therefore, it is necessary to explore
possibilities for additional or new space (laboratory and growth rooms/chambers) for PHYTOPATH as
the activities are increasing, e.g., as a consequence of the newly started FiDiPro project.

It is urgent to establish a system allowing professors and univ.lecturers of Univ. Helsinki to spend every
6th year on sabbatical to refresh their research skills and programmes, and to reserve the necessary
funds for employment of another competent person to carry out teaching and administrative tasks during the sabbatical.

**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.

Explaining backgrounds of PHYTOPATH seems relevant here for better understanding of the current structure and the strategic action plan (chapter 8). The personnel of PHYTOPATH has been recruited since 2001. Three of the four PIs moved from Sweden to UH after recruitment in 2001 (JV), 2002 (MP) and 2007 (FA). The fourth PI (RK) was recruited from MELTA. One univ. lecturer position in plant pathology is under recruitment. Thus the situation has much improved, considering that plant pathology had been without a permanent holder of the professorship in 1992-2001, and there were no university lecturer positions. In forest pathology the situation was better, but retirement of the professor led to decline of activities until FA and RK were recruited. In the meanwhile, plant pathology supported forest pathology with some resources. These recruitments were done at the then existing Dept. of Applied Biology, but subsequent administrative rearrangements resulted in splitting of forest pathology and plant pathology/virology to different new departments of Forest Sciences and Agricultural Sciences, respectively. However, the inter-departmental pathology laboratory was maintained by our request and is managed by the team of PIs.

Collaborations among the groups show fast increase. This was supported also by the Faculty with funding for joint activities after the administrative rearrangements. Indeed, because of the uniqueness of our individual skills and specialities, it is incumbent on us within PHYTOPATH to organise routine occasional meetings to effectively co-ordinate the teaching of plant and forest pathology. Studies on fungal pathogens in forest and plant pathology form an obvious tie in teaching and research. Furthermore, within forest pathology, there is a common interest in the integrated root rot and tree disease research, manifested through integrated projects with co-applicants within the current group (FA & RK). Similarly, the PIs of plant pathology/virology (JV & MP) have joint grants and publications on bacterial genomics and disease management in potato crops. In forest pathology, 4 PhD students are co-supervised within the group by FA and RK, whereas MP and JV are or have been co-supervising several MSc and PhD students. MP has acted as the professor of plant pathology since 2006 during JV’s work as an academy professor.

The University has shown appreciable support to renewal of our disciplines and formation of PHYTOPATH, and we have corresponded by competing successfully for substantial amounts of external funding (chapter 7) and showing productivity and quality in terms of scientific publication and doctoral education.

Over the years, we have maintained an informal leadership approach to maintain the confederate research groups. However, recently, FA & JV have jointly applied and secured a FiDiPro project grant which have given us the opportunity to formalise our research collaboration by further supporting the exchange and sharing of data and expertise in the core area of the research of PHYTOPATH, namely use of genomic data to understand pathogen-host interactions. Our long term goal is to be able to lay a solid research foundation for the creation of "Centre of Excellence in Phytopathogen Research".
RC'S strengths and challenges related to leadership and management, and the actions planned for developing the processes.

PHYTOPATH represents a coherent and logical RC in which most research questions are related, even between the different organisms studied. There is a lot of scope of synergism among the projects and collaboration between scientists and students, which will be exploited. The existing joint grants are strength and additional joint applications will be submitted. The FiDiPro project exemplifies the latest major, joint undertaking which necessitates the formation of a centralised research co-ordination for our mutual benefits. This need has also appeared when sizes of research groups have increased. We shall establish a regular meeting schedule for a management group consisting of the PIs, including the FiDiPro professor H.W. Lee. The size of the management group allows detailed and structured discussions at the level of daily operations but also strategic planning. One PI (JV) has completed a special degree on management, and other PIs may take similar education offered by UH. The PIs will continue to develop their skills in supervision via formal pedagogic education.

### 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: **5849350**

- **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: **953000**

- **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: **45000**

- **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:

- **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: University of Helsinki Research Fund; Helsingin yliopiston rahastot; Center of International Mobility (CIMO); Maj & Tor Nessling Foundation; Niemi Foundation; Finnish Concordia Foundation; Olvi Foundation
  - total amount of funding (in euros) from the above-mentioned foundations: **1547800**

- **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: FORMAS, Sweden; Sida, Sweden; The Council for Natural Sciences (NFR), Sweden; Swedish University of Agricultural Sciences (SLU), Sweden;
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 2 MATERIAL

Nordforsk/Norden; The Nordic Joint Committee for Agricultural Research (NKJ); NOVA University Network
- total amount of funding (in euros) from the above-mentioned funding organizations: 1532000

• 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: Ministry of Agriculture and Forestry; Ministry for Foreign Affairs
  - total amount of funding (in euros) from the above-mentioned funding organizations: 3575000

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 FiDiPro project (Comparative Genomics Platform on Fungal Pathobiology) sets the current goals for the strategic action plan. Systematic approaches for identifying biological functions or functional groupings are needed for a better understanding of evolution to parasitism, mutualism and saprophytic life styles. The FiDiPro project is unique because not much has been done on a similar and comparative scale for fungi. The approach will be applied also to comparison of bacterial genomes and viruses. The information to be obtained from such studies may be applicable not only for the understanding of the evolution of various pathogen forms but also in the control of plant diseases as well as animal and human diseases since some of the pathogens are similar. These investigations will advance understanding as well as facilitate the discovery of genes controlling important traits in pathogens and how they are regulated by the different interaction combinations, and will help to elucidate the molecular basis of ecological adaptation of a diverse range of pathogens. In these times of increasing wealth of organism genomes sequences becoming available, the key for maximal usage of data is in advanced methods of bioinformatics. In the context of plant and forest pathology, ‘advanced’ refers also to user-friendly software and a format of genome sequence database allowing comparisons between the different species based on the users’ desire without deep knowledge on bioinformatics. The FiDiPro professor H.W. Lee has pioneered in developing such a platform at National Univ. South Korea and will build up a mirror platform in PHYTOPATH. He will spend 50% of his time at UH in the five years of the project. We aim to develop a strong platform of theoretical expertise in pathogenomics which will facilitate research and educational goals and also utilize and transform the knowledge for development of novel solutions and applications for agriculture, forestry and bioindustry. The FiDiPro project ensures funding for development of the core personnel in the next 5 years. We’ll search for additional financial support to consolidate the expertise at UH in collaboration with different departments and faculties represented in the Advisory Board of the project. Indeed, the studies and goals of the FiDiPro project are of interest also in many other research fields and will provide many new opportunities to interdisciplinary collaboration in research and doctoral education.

Establishment of the “Finnish Centre of Excellence in Phytopathogen Research” is the next goal in the strategic action plan. The Center of Excellence (CoE) programme funded by the Academy of Finland would provide longer-term research funding to PHYTOPATH and support its continuing development as a coordinated RC. We shall also intensify efforts to apply EU funding (ERC, framework programs) with our international collaborators.

Finally, we see possibilities for PHYTOPATH to stimulate and lead important developments in forest and agricultural research. Utilization of modern molecular biology methods and experimental approaches is
still scarce in forest research in Finland, with exception of forest pathology that is deeply involved in implementing them. Interactions and collaboration of PHYTOPATH with research groups studying forest ecology, interactions of forest trees with environment, genetic diversity etc. will introduce the useful modern methods also to other sectors forest research. Signs of such developments are already evident, e.g., in terms of collaborative studies on fungal communities in roots, peat land and decaying wood. In agriculture, the consumers and society expect production to be more aware of the ecological consequences and be adjusted accordingly. Consequently, a large number of pesticides have been abandoned from use recently in the European Union. There is a great need to develop new methods for pest control to compensate the loss of chemicals used for decades. The new solutions must be based on biology, i.e., deep understanding on host-pathogen interactions, evolution of pathogens, mechanisms of virulence and resistance, and the ecology of the pathogens and pests. PHYTOPATH is deeply involved in producing the necessary data and can demonstrate the way forward in projects carried out in collaboration with relevant sectors of agricultural research.

The four PIs have all contributed equally. We had several meetings to crystallize the main issues at each point of the evaluation form. This was quite useful not only for the sake of preparation of the evaluation materials but also for planning of joint experimental work and long-term strategic planning. Subsequently, each of us drafted a number of sections and provided the project-specific data. The RC coordinator edited the draft for submission.
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

PHYTOPATH/Valkonen

1 Analysis of publications

<table>
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<td>A1 Refereed journal article</td>
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<td>D2 Article in professional hand or guide book or in a professional data system, or text book material</td>
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<td>E1 Popular contribution to book/other compilations</td>
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2 Listing of publications

A1 Refereed journal article

2005


Tairo, F, Mukasa, SB, Jones, RAC, Kulaya, A, Rubaihayo, PR, Valkonen, JPT, Valkonen, J. 2005. ‘Unravelling the genetic diversity of the three main viruses involved in Sweet Potato Virus Disease (SPVD), and its practical implications’, Molecular Plant Pathology, vol 6, pp. 199-211.


2006


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RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

PHYTOPATH/Valkonen


Meng, X, Bonasera, JM, Kim, JF, Nissinen, RM, Beer, SV, Nissinen, R 2006, 'Apple proteins that interact with DspA/E, a pathogenicity effector of Erwinia amylovora, the fire blight pathogen', Molecular Plant - Microbe Interactions, vol 19, no. 1, pp. 53-61.


2007


2008
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC TAHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

PHYTOPATH/Valkonen


Wang, Q, Valkonen, J 2008, 'Elimination of two viruses which interact synergistically from sweetpotato by shoot tip culture and cryotherapy', *Journal of Virological Methods*, vol 154, no. 1/2, pp. 135-145.


2009


Ramsell, JNE, Boutron, M, Martin, DP, Valkonen, JPT, Kvarnhened, A, Valkonen, J 2009, 'Studies on the host range of the barley strain of wheat dwarf virus using an agronomic crop clone', *Plant Pathology*, vol 58, no. 6, pp. 1161-1169.

Rannikä, M, Czekaj, V, Jones, RAC, Fletcher, JD, Davis, RI, Mi, L, Valkonen, JPT, Valkonen, J 2009, 'Molecular characterization of sweet potato feathery mottle virus (SPFMV) isolates from Easter Island, French Polynesia, New Zealand, and Southern Africa', *Plant Disease*, vol 93, no. 9, pp. 933-939.


Sun, H, Korhonen, K, Hantula, T, Kasanen, R 2009, 'Variation in properties of Phlebiopsis gigantea related to biocontrol against infection by Heterobasidion spp. in Norway spruce stumps', *Forest Pathology*, vol 39, no. 2, pp. 133-144.


Wang, Q, Valkonen, JPT 2008, 'IMPROVED RECOVERY OF CRYOTHERAPY-TREATED SHOOT TIPS FOLLOWING THERMOTHERAPY OF IN VITRO-GROWN STOCK SHOOTS OF RASPBERRY (Rubus idaeus L.)', *CryoLetters*, vol 30, no. 3, pp. 171-182.


2010


Tugume, AK, Cuellar, WJ, Mukasa, SB, Valkonen, J 2010, 'Molecular genetic analysis of virus isolates from wild and cultivated plants show East Africa as a hotspot for the evolution and diversification of Sweet potato feathery mottle virus', *Molecular Ecology*, vol 19, no. 15, pp. 3139-3156.


2008

2010

C1 Published scientific monograph
2006

D1 Article in professional journal
2007

2009

2010

D2 Article in professional hand or guide book or in a professional data system, or text book material
2007

2008

D3 Article in professional conference proceedings
2009

D4 Published development or research report
2007
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RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

PHYTOPATH/Valkonen


2010


2009

Kasnenen, R 2009, Metsäpuiden sienitaudit, Metsäkustannus, [Helsinki].

2005


2006


2007


2008

PHYTOPATH/Valkonen


2009


2010


E1 Popular contribution to book/other compilations

2005

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

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

PHYTOPATH/Valkonen

1 Analysis of activities 2005-2010

<table>
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<tr>
<th>Activity type</th>
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<td>Supervisor or co-supervisor of doctoral thesis</td>
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<tr>
<td>Prizes and awards</td>
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<tr>
<td>Editor of research journal</td>
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<tr>
<td>Peer review of manuscripts</td>
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<tr>
<td>Membership or other role in national/international committee, council, board</td>
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<td>Membership or other role of body in private company/organisation</td>
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<tr>
<td>Participation in interview for written media</td>
<td>9</td>
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2 Listing of activities 2005-2010

Supervisor or co-supervisor of doctoral thesis

Fred Asiegbu,
- Heterobasidion Conifer Pathosystem: Heterologous array analysis and transcriptional shift from saprotrophic to necrotrophic growth, Fred Asiegbu, 2003 → 2010, Sweden
- Transcript profiling of the conifer pathosystem: host and pathogen responses to biotic stress, Fred Asiegbu, 2003 → 2007, Sweden
- Transcription analysis of pinus sylvestris during ectomycorrhizal development, Fred Asiegbu, 2003 → 2008, Sweden
- Structural studies of sugar binding proteins, Fred Asiegbu, 2005 → 2010, Sweden
- Molecular and Physiochemical analysis of the response of Heterobasidion annosum to conifer wood extracts and osmotic stress, Fred Asiegbu, 2009 → 2010, Finland

Minna Pirhonen,
- Supervision of doctoral thesis, Minna Pirhonen, 01.01.2005, Finland
- Supervision of doctoral thesis, Minna Pirhonen, 01.01.2006, Germany
- Supervision of doctoral thesis, Minna Pirhonen, 01.01.2007, Norway

Jari Valkonen,
- Supervision of doctoral thesis, Jari Valkonen, 01.01.2005 → 31.01.2005, Norway
- Supervision of doctoral thesis, Jari Valkonen, 01.01.2007 → 31.12.2007, Finland
- Supervision of doctoral thesis, Jari Valkonen, 01.01.2007 → 31.12.2007, Finland
- Supervision of doctoral thesis, Jari Valkonen, 01.01.2007 → 30.11.2007, Finland

Minna Rajamäki,
- Co-supervision: PhD thesis of Marjo Ala-Poikela, Minna Rajamäki, 2004 → ...
- Co-supervision: PhD thesis of Tuuli Haikonen, Minna Rajamäki, 2005 → ...

Prizes and awards

Johanna Nykyri,
- Kasvinsuojeluseura ry:n palkinto opinnäytetyöstä, Johanna Nykyri, 19.03.2009

Editor of research journal

Minna Pirhonen,
- Molecular Plant Pathology, Minna Pirhonen, 01.01.2006 → 31.12.2006
- European Journal of Plant Pathology, Minna Pirhonen, 01.01.2007 → 31.12.2007
- Molecular Plant Pathology, Minna Pirhonen, 01.01.2008 → 31.12.2008
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

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

PHYTOPATH/Valkonen

Jari Valkonen ,
Archives of Virology, Jari Valkonen, 01.01.2005 → 31.12.2005
Molecular Breeding, Jari Valkonen, 01.01.2005 → 31.12.2005
Molecular Plant pathology, Jari Valkonen, 01.01.2005 → 31.12.2005
Molecular Plant-Microbe Interactions, Jari Valkonen, 01.01.2005 → 31.12.2005
Plant Cell Reports, Jari Valkonen, 01.01.2005 → 31.12.2005
Plant Journal, Jari Valkonen, 01.01.2005 → 31.12.2005
Potato Research, Jari Valkonen, 01.01.2005 → 31.12.2005
Theoretical and Applied Genetics, Jari Valkonen, 01.01.2005 → 31.12.2005
Virology, Jari Valkonen, 01.01.2005 → 31.12.2005
Archives of Virology, Jari Valkonen, 01.01.2006 → 31.12.2006, United Kingdom
Journal of Virology, Jari Valkonen, 01.01.2006 → 31.12.2006, United Kingdom
Molecular Breeding, Jari Valkonen, 01.01.2006 → 31.12.2006
Molecular Plant-Microbe Interactions, Jari Valkonen, 01.01.2006 → 31.12.2006, United Kingdom
Molecular Plant-Microbe Interactions, Jari Valkonen, 01.01.2006 → 31.12.2006, United Kingdom
Plant Journal, Jari Valkonen, 01.01.2006 → 31.12.2006, United Kingdom
Potato Research, Jari Valkonen, 01.01.2006 → 31.12.2006, United Kingdom
Annals of Applied Biology, Jari Valkonen, 01.01.2007 → 31.12.2007, United Kingdom
EMBO Journal, Jari Valkonen, 01.01.2007 → 31.12.2007
Forest pathology, Jari Valkonen, 01.01.2007 → 31.12.2007
Journal of General Virology, Jari Valkonen, 01.01.2007 → 31.12.2007, United Kingdom
Journal of Virology, Jari Valkonen, 01.01.2007 → 31.12.2007
Luonnon Tutkija, Jari Valkonen, 01.01.2007 → 31.12.2007, Finland
Molecular Pathology, Jari Valkonen, 01.01.2007 → 31.12.2007, United Kingdom
Molecular Plant-Microbe Interactions, Jari Valkonen, 01.01.2007 → 31.12.2007, United States
Phytopathology, Jari Valkonen, 01.01.2007 → 31.12.2007
Plant Pathology, Jari Valkonen, 01.01.2007 → 31.12.2007
Potato Research, Jari Valkonen, 01.01.2007 → 31.12.2007, Netherlands
Transgenic Research, Jari Valkonen, 01.01.2007 → 31.12.2007
Annals of Applied Biology, Jari Valkonen, 01.01.2008 → 31.12.2008, United Kingdom
Journal of Virology, Jari Valkonen, 01.01.2008 → 31.12.2008, United States
Molecular Plant Pathology, Jari Valkonen, 01.01.2008 → 28.02.2008, United Kingdom
Molecular Plant-Microbe Interactions, Jari Valkonen, 01.01.2008 → 31.12.2008, United States
Phytopathology, Jari Valkonen, 01.01.2008 → 31.12.2008, United States
Potato Research, Jari Valkonen, 01.01.2008 → 31.12.2008, Netherlands
Virology, Jari Valkonen, 01.01.2008 → 31.12.2008, United States

Peer review of manuscripts
Risto Kasanen
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

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

PHYTOPATH/Valkonen

Do bark beetles facilitate the establishment of rot fungi in Norway spruce?, Risto Kasanen, 2010 → ..., United Kingdom
Non-native tree pathogens detected during the last two decades in Finland, Risto Kasanen, 2010 → ...
Vieraslajit tautien aiheuttajina metsäpuilla, Risto Kasanen, 2010 → ...

Minna Rajamäki,
Reviewer (Potato Research), Minna Rajamäki, 2002 → ...
Reviewer (Ann Appl Biol), Minna Rajamäki, 2005 → ...
Reviewer (Mol Plant Pathol), Minna Rajamäki, 2005 → ...
Reviewer (Virus res), Minna Rajamäki, 2005 → ...
Reviewer (Eur J Plant Pathol), Minna Rajamäki, 2006 → ...
Reviewer (J Gen Virol), Minna Rajamäki, 2007 → ...
Reviewer (Plant Pathol), Minna Rajamäki, 2007 → ...
Reviewer (Plant Physiol), Minna Rajamäki, 2009 → ...
Reviewer (Plant Pathol), Minna Rajamäki, 2010 → ...

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

Fred Asiegbu,
Member of the Biotechnology board at Helsinki University, Fred Asiegbu, 01.07.2007 → 01.07.2013, Finland
member of the board for International masters programme in forestry and Business, Fred Asiegbu, 01.07.2007 → 01.07.2013, Finland
"ATLANTIS" Board - Transatlantic Masters degree program in Forest Resources, Fred Asiegbu, 01.10.2008 → 30.12.2011, Finland
Biological Interaction Graduate school, Finland, Fred Asiegbu, 01.06.2009 → 01.09.2011, Finland

Jari Valkonen,
Biotekniikan neuvottelukunta, Jari Valkonen, 01.01.2005 → 31.12.2005
European Association of Potato Research (EAPR), Jari Valkonen, 01.01.2005 → 31.12.2005
Kasvinsuojeluseura (varapuheenjohtaja), Jari Valkonen, 01.01.2005 → 31.12.2005
Suomalainen tiedeakatemia, Jari Valkonen, 01.01.2005 → 31.12.2005
Suomen Maataloustieteellinen Seura, Jari Valkonen, 01.01.2005 → 31.12.2005
Kasvinsuojeluseura ry., Jari Valkonen, 01.01.2006 → 31.12.2006, Finland
Kasvinsuojeluseura ry., Jari Valkonen, 01.01.2006 → 31.12.2006, Finland
Kasvinsuojeluseura ry., Jari Valkonen, 01.01.2007 → 31.12.2007, Netherlands
Kasvinsuojeluseura ry., Jari Valkonen, 01.01.2007 → 14.03.2007, Finland
Suomen maataloustieteellinen seura, Jari Valkonen, 01.01.2007 → 19.04.2007, Finland
European Association for Potato Research (EAPR), Jari Valkonen, 07.07.2008 → 31.12.2008, Netherlands

Johanna Santala,
Kasvinsuojeluseuran hallitus, Johanna Santala, 2008 → ..., Finland

Membership or other role of body in private company/organisation

Minna Pirhonen,
Kasvinsuojeluseura, kansainvälinen joasto, Minna Pirhonen, 01.01.2005, Finland
Kasvinsuojeluseura (kansainvälinen osasto), Minna Pirhonen, 01.01.2006, Germany

Participation in interview for written media

Jari Valkonen,
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

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

PHYTOPATH/Valkonen

Rintalakeus, Jari Valkonen, 06.08.2003 → 31.12.2011, Finland
Perun suurlähetystön järjestämä International Year of Potato 2008 -iltatilaisuus, Jari Valkonen, 02.10.2008 → 31.12.2011, Finland
Research Group: Valkonen J

**Basic statistics**
- Number of publications (P): 98
- Number of citations (TCS): 538
- Number of citations per publication (MCS): 5.49
- Percentage of uncited publications: 24%
- Field-normalized number of citations per publication (MNCS): 1.23
- Field-normalized average journal impact (MNJS): 1.17
- Field-normalized proportion highly cited publications (top 10%): 1.26
- Internal coverage: .80

**Trend analyses**

**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

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