

# Curriculum vitae

## PERSONAL INFORMATION

### 1.1 Personal data

Magnus Karlsson

Date of birth: 7th of June 1974. Nationality: Swedish. Family: Married and four children.

Researcher ID: P-6556-2014, ORCID: <https://orcid.org/0000-0001-6098-138X>.

URL for web site: <https://www.slu.se/en/cv/magnus-karlsson>

### 1.2 Current employment

Professor in Plant Pathology, from 2022-09-01. Department of Forest Mycology and Plant Pathology, Swedish University of Agricultural Sciences (SLU).

### 1.3 Previous employments

- Senior lecturer, 2021-01-01 to 2022-08-31. Department of Forest Mycology and Plant Pathology, SLU.
- Researcher (Forskare), 2011-08-01 to 2020-12-30. Department of Forest Mycology and Plant Pathology, SLU. From 2018-07-01 also affiliated with the Centre for Biological Control, SLU, at 50%.
- Assistant Professor (Forskarassistent), 2009-02-01 to 2011-07-31. Department of Forest Mycology and Plant Pathology, SLU.
- Post-doc (Forskare), 2006-04-18 to 2009-01-31. Department of Forest Mycology and Plant Pathology, SLU.
- Post-doc (Forskare), 2005-06-01 to 2006-04-13. Department of Evolution, Genomics and Systematics, section of Evolutionary Biology, Uppsala University.
- PhD-student (Doktorand), 2000-01-01 to 2005-04-30. Department of Forest Mycology and Pathology, SLU.
- Research assistant (Forskningsassistent), 1999-11-01 to 1999-12-31. Department of Forest Mycology and Pathology, SLU.

## EDUCATION

### 2.1 University degrees

- Degree of Doctor of Philosophy in Biology, 2005, SLU.
- Degree of Master of Science (One Year) in Biology, 1999, Uppsala University.

### INTERRUPTIONS IN RESEARCH

Parental leave approx. 12 months during PhD studies (2000-2005). Parental leave approx. 12 months since completion of PhD program (2005-2018).

## SCIENTIFIC QUALIFICATIONS

### Assignments and other relevant information

Deputy Head of Department, Forest Mycology and Plant Pathology, 2022-onwards

Deputy Director of the SLU Centre for Biological Control (CBC), 2019-2022.

Coordinator of SIDA-project BIO-BASED INPUTS: Biocontrol of coffee fungal pathogens, Microbial treatment for quinoa growth. 2021-2025 (Bolivia).

Coordinator of project Resistance breeding for healthy crops. Collaboration between four plant breeding companies, one grower organization and four SLU departments, 2019-2024.

Partner in the Trichoderma Whole Genus Genomic Project, part of the US Department of Energy Joint Genome Institute's Community Sequencing Program.

Work package leader in project Plant breeding for optimised interactions between crops and microorganisms to enhance disease management and production with reduced agrochemical use.

Leader and PI of the *Clonostachys rosea* Genome Consortium. Collaboration between 24 scientists, representing 12 different laboratories from 8 different countries.

Mentor in the SLU mentor programme 2019-2021.

Member of the Forest Mycology and Plant Pathology departmental board, first as Ph.D.-student representative (2002-2005) and then as Researcher representative (2007-2010).

Substitute in the Faculty of Natural Resources and Agricultural Sciences election committee 2015-2018, SLU.

Board member of the Organismbiology research school, 2017-2021, SLU.

Member of organizing committees: Biocontrol of Plant Diseases: "From the field to the laboratory and back again", XIII IOBC Meeting of the Working Group Biological control of fungal and bacterial plant pathogens, Uppsala, 2014. Enzymes from fungal interactions: Their role in host interactions and biomass conversion, Uppsala, 2013.

Editor of the IOBC/wprs Bulletin vol. 115 (2016), Biological control of fungal and bacterial plant pathogens.

Review editor for *Frontiers in Fungal Biology*, section Fungi-Plant Interactions (2020-).

Review editor for *Frontiers in Microbiology*, section Fungi and their interactions (2019-2020).

Chairman of the Swedish national network for rare chromosome disorders, 2013-2014.

### 3.1 Funding from research councils

- Swedish Research Council, Mycotoxins and food safety in Rwanda: Understanding the biology and epidemiology of maize ear rots for sustainable maize production. Co-applicant, 2023-2026, 4500 kSEK.
- FORMAS, Harnessing soil-microbe-plant interactions for sustainable wheat production. Co-applicants, 2022-2024, 3000 kSEK.
- FORMAS, Wild resources for climate resilience and pest control in strawberry. Co-applicant, 2019-2021, 3000 kSEK.
- FORMAS, Small-RNA based strategies to control fungal plant pathogens- an unexplored mechanism in biocontrol interactions. Co-applicant, 2019-2021, 2998 kSEK.
- FORMAS, Population genomics of the fungus *Clonostachys rosea* for improved biological control of fusariose in wheat. Main applicant, 2016-2018, 3000 kSEK.
- FORMAS, Biological control of plant pathogenic nematodes in organic crop production by the nematode-parasitizing fungus *Clonostachys rosea*. Co-applicant, 2015-2018, 1610 kSEK.
- FORMAS, Consortia of biological control organisms formulated for improving plant health – a novel technology for sustainable crop protection. Co-applicant, 2013-2015, 4993 kSEK.
- FORMAS, Exploitation of DNA reporter technology and gene knock outs in filamentous fungi for studying the role of secreted enzymes in biocontrol interactions. Co-applicant, 2010-2011, 900 kSEK.

### 3.2 Funding from research foundations

- The Carl Trygger Foundation for Scientific Research, Small-RNAs in mycoparasitic interactions. Co-applicant, 2020-2022, 822 kSEK.
- The Swedish Farmers' Foundation for Agricultural Research, Breeding for root rot resistance in pea. Main applicant, 2014-2016, 1250 kSEK.
- The Carl Trygger Foundation for Scientific Research, Genome-analysis of the fungus *Clonostachys rosea* for increased knowledge on biological control of fungal diseases on agricultural crops. Main applicant, 2012-2013, 569 kSEK.
- The C.F. Lundström Foundation, Transcriptome analysis of a new, emerging *Phytophthora* pathogen on pea, using massive parallel sequencing. Main applicant, 2010, 80 kSEK.
- The Carl Trygger Foundation for Scientific Research, Functional differentiation of fungal chitinases. Main applicant, 2009-2010, 222 kSEK.
- The Royal Swedish Academy of Sciences, Functional differentiation of fungal chitinases. Main applicant, 2009, 83 kSEK.
- The Royal Swedish Academy of Sciences, Peroxisomal functioning in fungal pathogenesis. Main applicant, 2007, 30 kSEK.

### 3.3 Funding from additional sources

- Sweden's government agency for development cooperation (SIDA), BIO-BASED INPUTS: Biocontrol of coffee fungal pathogens, Microbial treatment for quinoa growth. Co-applicant, 2021-2025, two sandwich PhD students.
- Federal Ministry of Food and Agriculture (BMEL), Germany, Characterization of *Aphanomyces cochlioides* in Europe. Co-applicant, 2021-2024, 5660 kSEK.
- SLU Grogrund, Plant breeding for optimised interactions between crops and microorganisms to enhance disease management and production with reduced agrochemical use. Co-applicant, 2020-2025, 11660 kSEK.
- SLU Grogrund, Resistance breeding for healthy crops. Main applicant, 2019-2023, 32000 kSEK.
- Danish Environmental Protection Agency, Microbial biocontrol agents in IPM strategies - reducing pesticide use in wheat and lowering the risk of fungicide resistance. Co-applicant, 2017-2020, 4043 kSEK.
- Plant Protection Platform, SLU, Biological control of plant pathogenic nematodes by the fungus *Clonostachys rosea*. Main applicant, 2016-2018, 1800 kSEK.
- The Department of Forest Mycology and Pathology, SLU, granted me funds to cover the salary for a PhD student for 4 years (approx. 2400 kSEK). Title: Functional differentiation of fungal chitinases. 2009-2012.

### 3.4 Assessment of research applications

Assessment of a research grant proposal for the Austrian Science Fund, Austria, 2021.

Assessment of a research grant proposal for the TWF research fund, Austria, 2018.

Assessment of a research grant proposal for the Austrian Science Fund, Austria, 2016.

Assessment of a research grant proposal for the National Science Foundation, USA, 2013.

### 3.5 National and international prizes

Awarded for best student presentation at the 7<sup>th</sup> International Mycological Congress, Oslo, Norway, 2002.

### 3.6 Editorial/advisory board in international journals

Review editor for *Frontiers in Fungal Biology*, section Fungi-Plant Interactions (2020-).

Review editor for *Frontiers in Microbiology*, section Fungi and their interactions (2019-2020).

Editor of the *IOBC/wprs Bulletin* vol. 115 (2016), Biological control of fungal and bacterial plant pathogens.

### 3.7 Commission as opponent

- Opponent at the PhD defence of Carla Ximena Colque-Little, Department of Plant and Environmental Sciences, University of Copenhagen, Denmark, 2021. Title: Genetic variation of quinoa (*Chenopodium quinoa* Willd.) diversity panel in response to downy mildew (*Peronospora variabilis* Gäum.) and discovery of new fungal diseases.
- Opponent at the PhD defence of Delfia Isabel Marcenaro Rodriguez, Department of Agricultural Science, University of Helsinki, Finland, 2018. Title: Seedborne fungi and viruses in bean crops (*Phaseolus vulgaris* L.) in Nicaragua and Tanzania.
- Opponent at the PhD defence of Xiaoxue Tong, Department of Chemistry and Bioscience, Aalborg University, Denmark, 2015. Title: Exploration of lipases and esterases from thermophilic fungi.

### 3.8 Commissions as PhD evaluation committee member

- Markus Hiltunen, Department of Organismal Biology, Uppsala University, Sweden, 2021.
- Thi Ahn Tuyet Bui, Department of Chemistry and Molecular Biology, University of Gothenburg, 2020.
- Dmytro Kryvokhyzha, Department of Ecology and Genetics, Uppsala University, 2018.
- Konstantia Gkarmiris, Department of Forest Mycology and Plant Pathology, SLU, 2018.
- Zaenab A. Fahad, Department of Forest Mycology and Plant Pathology, SLU, 2017.
- Qinsong Liu, Department of Plant Biology, SLU, 2016.
- Malin Abrahamsson, Department of Plant Biology, SLU, 2016.
- Tianqing Zhu, Department of Plant Biology, SLU, 2015.
- Shashidar Asari, Department of Plant Biology, SLU, 2015.
- Adnan Niazi, Department of Animal Breeding and Genetics, SLU, 2014.
- Daniel Uddenberg, Department of Plant Biology and Forest Genetics, SLU, 2013.
- Karl-Magnus Andersson, Department of Biology, Lund University, 2013.
- Anna Johansson, Department of Plant Biology and Forest Genetics, SLU, 2013.
- Jorge Ulises Blandón-Díaz, Department of Forest Mycology and Pathology, SLU, 2011.

### 3.9 Commissions as expert

- Assessment of PhD thesis. Isabel Vicente Munoz, Department of Agriculture, Food and Environment, University of Pisa, Italy, 2020.
- Assessment of the scientific competence in regard to an application to South Africa's National Research Foundation, 2019.
- Assessment of the scientific competence in regard to an application for Docent appointment, Faculty of Agriculture and Forestry, University of Helsinki, Finland, 2015.
- External evaluator of 50% and 80% PhD-student follow-up evaluations: Anne Njoroge, Hanneke Peele, Tom Martin, Louise Andersson.

### 3.10 Referee for international peer-reviewed journals

Referee assignments for 51 different scientific journals, on multiple occasions.

### 3.11 Patents

BCA control of STB (2019) Biological control of septoria tritici blotch.

## PEDAGOGIC QUALIFICATIONS

### 4.1 Teaching on basic, advanced and postgraduate levels

#### Basic level:

- Teaching on the course Crop Production - weeds, pests and diseases (15 ECTS), 2022.
- Teaching on the course Plant Breeding and Plant Physiology (15 ECTS), 2021-2022.
- Teaching on the course Basic course - agronomist soil/plant (15 ECTS), 2021.
- Teaching on the course Crop Production Instruments with Applied Law for the Agricultural Sciences (15 ECTS), 2021.
- Course responsibility for Molecular Ecology and Evolution (15 ECTS), 2014.
- Teaching on the course Molecular Ecology and Evolution (15 ECTS), 2012-2018.
- Teaching on the course Molecular Evolution (15 ECTS), 2009-2011.
- Laboratory practical supervisor on the courses The World of Organisms, Fungal Ecology, and Forest Microbiology, during my PhD studies (2000-2005).

#### Advanced level:

- Teaching on the course Research Training (15 ECTS), 2020.
- Teaching on the course Plant Pathology (15 ECTS), 2009-2022.
- Teaching on the course Ecology and management of diseases and pest of forest trees (15 ECTS), 2009-2011, 2016-2020.
- Teaching on the course Plant-Microbe Interactions (15 ECTS), 2016, 2020.
- Teaching on the course Mycology, part of the Veterinary infection biology, parasitology and mycology course (15 ECTS), 2012-2023.

#### Postgraduate level:

- Teaching on the course NOVA PhD Course on Plant Pathology, “Biotrophic and hemibiotrophic plant pathogens and their host plant interactions”, Copenhagen University, 4 ECTS, 2023.
- Course responsibility for course Mycology and Plant Pathology, Universidad Mayor De San Andres, La Paz, Bolivia, 1 ECTS, 2022.
- Teaching on the course Plant disease epidemiology– from theory to applications, SLU, 4.5 ECTS, 2020.
- Teaching on the course Forest Pathology in the 21st century, SLU, 3 ECTS, 2019.
- Teaching on the course NOVA PhD Course on Plant Pathology, “Biotrophy - from recognition to ecology”, Aarhus University, 4 ECTS, 2018.
- Course responsibility for NOVA PhD Course on Plant Pathology, “Biological control: Microbial interactions for improved plant health”, SLU, 4 ECTS, 2017.
- Teaching on the course Molecular Infection Biology, SLU, 3 ECTS, 2017.
- Course responsibility for PhD course Evolution – effects on genes, individuals and populations, SLU, 4 ECTS, 2015.
- Teaching on the course NOVA PhD Course on Plant Pathology, “Genomic and transcriptomic sequences - a revolution in Plant Pathology?”, University of Copenhagen, 5 ECTS, 2014.
- Teaching on the course DIAROD, Training School on Molecular Detection and Population Genetics of Dothistroma Needle Blight Pathogens, COST Action FP1102. SLU, 2014.

- Teaching on the course Phylogenetic Analysis, SLU, 6 ECTS, 2010, 2013.
- Teaching on the course NOVA PhD Course on Plant Pathology, “Innate immunity of plants”, University of Helsinki, 5 ECTS, 2012.
- Course responsibility for the course Methodological approaches to studying genes encoding secreted proteins in fungal host interactions, SLU, 1.5 ECTS, 2011.
- Teaching on the course NordForsk: Preparing samples for fungal community sequencing, SLU, 2011.
- Course responsibility for Seminar series in Organism Biology, SLU, 2 ECTS, 2010-2011.
- Teaching on the course Novel technologies for management of the beneficial and harmful microbes in the root system, AB-RMS course, University of Copenhagen, 2008.
- Course responsibility for PCR methods, 1 ECTS, SLU, 2007.
- Course responsibility for Fungal Genomics and Annotation, 1.5 ECTS, SLU, 2007.

## 4.2 Supervision of B.Sc. and M.Sc. work

Supervised 17 B.Sc./M.Sc. students.

## 4.3 Supervision of Ph.D. work

- Yvonne Bösch, admission 2018, dissertation 2022, Ecology of fungal denitrifiers in agricultural soil. Main supervisor: Sara Hallin. Co-supervisors: Magnus Karlsson, Christopher Jones, Roger Finlay.
- Mudassir Iqbal, admission 2016, dissertation 2019, Biological control of plant pathogenic nematodes in organic crop production by the nematode-parasitizing fungus *Clonostachys rosea*. Main supervisor: Magnus Karlsson. Co-supervisors: Dan Funck Jensen, Mukesh Dubey, Maria Viketoft.
- Islam A. Abd El-Daim, admission 2011, dissertation 2015, Use of rhizobacteria for the alleviation of plant stress. Main supervisor: Salme Timmusk. Co-supervisors: Magnus Karlsson, Elna Stenström.
- Sara Hosseini (Hadji Mollahosseini), admission 2011, dissertation 2015, Host-pathogen interactions in root infecting oomycete species. Main supervisor: Magnus Karlsson. Co-supervisors: Dan Funck Jensen, Malin Elfstrand, Fredrik Heyman.
- Georgios Tzelepis, admission 2010, dissertation 2014, Functional differentiation of glycoside hydrolases family 18 in filamentous ascomycetes. Main supervisor: Magnus Karlsson. Co-supervisors: Dan Funck Jensen, Jan Stenlid, Petter Melin.
- Chatchai Kosawang, admission 2009, dissertation 2013, Three way interactions between *Fusarium* species, their plant hosts and biocontrol organisms. Main supervisor: David B. Collinge. Co-supervisors: Magnus Karlsson, Dan Funck Jensen.
- Rebecka Strandberg, admission 2007, dissertation 2012, On the evolution of reproductive systems in *Neurospora*. Main supervisor: Hanna Johannesson. Co-supervisors: Magnus Karlsson, Hans Ellegren.
- Kristiina Nygren, admission 2005, dissertation 2011, Evolutionary consequences of reproductive strategies: Testing theory on sex and reproductive gene evolution in the fungal model *Neurospora*. Main supervisor: Hanna Johannesson. Co-supervisors: Magnus Karlsson, Hans Ellegren.

#### 4.4 Supervision of Licentiate work

- Anthony C. Mgbеаhуrіkе, admission 2007, dissertation 2009, A study of the traits associated with the biocontrol activity of *Phlebiopsis gigantea*. Main supervisor: Frederick O. Asiegbu. Co-supervisor: Magnus Karlsson.

#### 4.5 Supervision of current Ph.D. work

- Virginia Gonzales, admission 2022, ongoing, Studying microbial interactions and traits to improve quinoa resilience to climate variability. Main supervisor: Magnus Karlsson. Co-supervisors: Mukesh Dubey, Carla Crespo, Dan Funck Jensen.
- Marisel Mamani, admission 2022, ongoing, Biological control of coffee pathogens in Bolivia. Main supervisor: Mukesh Dubey. Co-supervisors: Magnus Karlsson, Carla Crespo, Dan Funck Jensen.
- Sidhant Chaudhary, admission 2021, ongoing, Biological control of septoria tritici blotch in wheat. Main supervisor: Magnus Karlsson. Co-supervisors: Dan Funck Jensen, Mukesh Dubey, Laura Grenville-Briggs Didymus.
- Carol Kälın, admission 2020, ongoing, Breeding of pea for increased disease-resistance against root rot. Main supervisor: Magnus Karlsson. Co-supervisors: Mukesh Dubey, Agnese Brantestam, Malin Elfstrand, Salim Bourras.

#### 4.6 Supervision of post-docs

Edoardo Piombo, Martin Broberg, Lea Atanasova, Kristiina Nygren, Nicklas Samils, Fredrik Heyman, Mukesh Dubey.

#### 4.7 University level pedagogic education

Lunch Colloquium for Research Supervisors, 2013, 2017-2020, SLU. Case method: What's in it for us?, 2015, SLU. Seminar in Student Supervision, 2013, SLU. Course in grading and assessment, 2013, SLU. SLU Future Academic Leaders, 2012, SLU. Pedagogic course for Associate Professors, 2008, SLU. Project leading, 2004, SLU. Leadership, organization and working life, 2004, SLU. Basic pedagogic course, 2000, SLU.

#### 4.8 Pedagogic development activities

Developing a new 3-year bachelor program in Biotechnology for Sustainability, 2019, Swedish University of Agricultural Sciences.

## ADDITIONAL QUALIFICATIONS

#### 5.1 Active participation in international conferences

Summary: Keynote speaker at 4 occasions, invited speaker at 13 conferences, oral presentations at 33 conferences. Organizer committee member for 2 conferences, scientific committee member for 3 conferences, session organizer/chair on 7 occasions.

#### 5.3 External contacts and external work

Participation in Subject committee for Weeds and Plant Protection meetings.

#### 5.4 Cooperation/interaction with industry stakeholders

Lantmännen, Ecogen, BVT, Findus Sverige AB, Chr. Hansen A/S, Lantmännen BioAgri AB, Novozymes A/S, Bayer CropScience AG.

## Popular science

- Resistance breeding and biological control in future plant protection (2023). Regional conference in crop production and plant protection.
- Grogrund – research on plant protection (2022). Popular science presentation for the national plant protection council.
- Biological control and resistance breeding in future plant protection (2022). Popular science presentation at Borgeby agricultural fair.
- Webinar, Resistance breeding for healthy crops (2021).
- Smart plant breeding reduces the need for pesticides (2021).
- Webinar, Resistance breeding for healthy crops (2020).
- Inauguration of the BioCenter at SLU (2011). Popular science presentation for invited stakeholders from industry, authorities and politicians.
- Fungal diseases in Swedish forest nurseries (2007). Popular science presentation at a two-day forestry meeting for foresters, companies and public in Lithuania.
- Pathogenicity factors in the conifer root rot pathogen (2005). Popular science presentation in the local radio (Radio Uppland).
- Pathogenicity factors in the conifer root rot pathogen (2005). Popular science presentation on a root rot research information meeting, with representatives from Swedish forest companies, biocontrol agent producers and the Swedish National Board of Forestry.