

Curriculum Vitae

Rudolf Schlechter (he | him)

Postdoc | Microbiologist

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Research Interest

- My current research interests involve mechanisms that drive microbial community assembly in the phyllosphere. Combining culture-dependent techniques, molecular biology and genetics, fluorescence microscopy, spatial statistics, and macro- and microecological frameworks, I am interested in understanding bacterial interactions and their impact on microbial community structure and ecosystem functioning on plants.
- Since 2013, I co-authored 16 peer-reviewed publications and 2 book chapters on topics related to plant biology and microbiology. My research has been cited 1101 times and my h-index and i10-index are 11 and 13, respectively.

Education

2017–2021	University of Canterbury, Ph.D. Microbiology Thesis: "Driving factors of bacterial interactions and spatial patterns in the phyllosphere" Senior Supervisor: Prof. M. Remus-Emsermann. Associate Supervisors: Prof. Emerita P. Jameson, Assoc. Prof. M. Stott
2013–2014	Pontificia Universidad de Chile, Licenciata Biochemistry (M.Sc. equivalent) Thesis: "Characterisation of the immune response conferred by the <i>loci</i> RUN1 and REN1 in <i>Vitis vinifera</i> against <i>Erysiphe necator</i> " Senior Supervisor: Prof. P. Arce-Johnson
2009–2013	Pontificia Universidad de Chile, B.Sc. Biochemistry

Research Experience

Oct 2021–Present	Freie Universität Berlin, Remus-Emsermann Lab, Postdoc <ul style="list-style-type: none">– <i>Microbiology</i>: Functional diversity in leaf-associated bacteria– <i>Molecular Biology</i>: Development of CRISPR-guided transposon system in non-model bacteria– <i>Bioinformatics</i>: Metabolic modelling
May 2017–Jun 2021	University of Canterbury, Remus-Emsermann Lab, Ph.D. student <ul style="list-style-type: none">– <i>Bacterial genetic modification</i>: Development of a genetic toolbox for the stable labelling of <i>Proteobacteria</i> with fluorescent proteins– <i>Genomics</i>: Reconstruction and analysis of genome-scale metabolic models to study metabolic relationships between phyllosphere bacteria– <i>Factors driving species interactions and spatial distribution patterns</i>: Combination of <i>in vitro</i> and <i>in planta</i> experiments with fluorescence microscopy and spatial statistics to determine the influence of resource overlap and phylogenetic relationships in interactions and spatial patterns between competing bacteria in the <i>Arabidopsis thaliana</i> phyllosphere– <i>Single-cell bioreporters</i>: Use of CUSPER bioreporter in <i>Pantoea eucalypti</i> 299R to estimate the effect of resource competition in single-cell bacterial fitness in the phyllosphere
Jan 2017–Apr 2017	Pontificia Universidad Católica de Chile, Arce-Johnson Lab, Research Assistant <ul style="list-style-type: none">– <i>Plant-pathogen interactions</i>: Gene expression analysis of grapevine response to the infection of powdery mildew– <i>Capillary electrophoresis</i>: Establishment and standardisation of DNA Genetic Analyser instrument for DNA fragment analysis through capillary electrophoresis
Oct 2015–Oct 2016	ETH, Plant Cell Biology Group, Research Assistant <ul style="list-style-type: none">– <i>Role of endocytosis in plant-pathogen interactions</i>: Live-cell imaging of <i>Arabidopsis thaliana</i> root endocytic and vesicular trafficking response against <i>Fusarium oxysporum</i>– <i>Calcium imaging</i>: Live-cell imaging of calcium dynamics in <i>Arabidopsis</i> roots with the fluorescent biosensor R-GECO1 and the microfluidic platform RootChip. <i>Visiting scholar at COS, University of Heidelberg. Schumacher and Grossmann Lab</i>
Apr 2014–Feb 2015	AgriJohnson Ltd., Research Assistant <ul style="list-style-type: none">– <i>Grapevine virus detection platform</i>: Development of a simultaneous detection of grapevine viruses in <i>Vitis vinifera</i> through multiplex PCR– <i>Tissue culture</i>: Establishment of virus-free commercially-relevant grapevine cultivars through plant tissue culture techniques
Jan 2013–May 2014	Pontificia Universidad Católica de Chile, Arce-Johnson Lab, M.Sc. student

- *Selection of resistant grapevine genotypes*: Use of molecular markers to select for grapevine individuals that carry the resistant *loci* *RUN1* and *REN1*
- Jan 2013–May 2014 – *Cellular and molecular immune responses of resistant and susceptible grapevine varieties against powdery mildew*: The response of grapevine plants carrying the *loci* *RUN1* and/or *REN1* were evaluated upon inoculation with the powdery mildew. Plants carrying both *loci* were associated with the suppression of fungal spore germination and an increased expression of a gene related to stilbene biosynthesis, which is involved in plant biotic stress responses

Academic Experience

Honours and Awards

- 2019 Travel grant - New Zealand Microbiological Society (NZMS) Conference
- 2018 Third Place Student Poster Presentation Competition. NZMS-NZSBMB Joint Annual Conference. University of Otago, Dunedin, New Zealand
- 2017–2021 New Zealand International Doctoral Research Scholarship. Education New Zealand (ENZ), New Zealand
- 2017 UC College of Science PhD Scholarship. University of Canterbury, New Zealand
- 2011–2013 Honour Scholarship for excellent academic performance. Pontificia Universidad Católica de Chile, Chile

Teaching

- 2023 **Freie Universität Berlin**, Course coordinator
BIOCHEPHA_23411_23W: Plant-microbe interactions
BIOCHEPHA_23411_23S: Leaf Surface Microbiology
BIOCHEPHA_23411_23S: Micrometre scale plant-microbe interactions
- 2022 **Freie Universität Berlin**, Course coordinator
BIOCHEPHA_23411_22S: Leaf Surface Microbiology
BIOCHEPA_23413_22W: Plant-microbe interactions
Freie Universität Berlin, Guest Lecturer
BIOCHEPA_23104_22W: Biochemie und Mikrobiologie (BM)
- 2021 **University of Canterbury**, Guest Lecturer
BIOL313: Advanced Microbiology
BIOL213: Microbiology
- 2020 **University of Canterbury**, Demonstrator (Teaching assistant)
BIOL313: Advanced Microbiology
- 2019 **University of Canterbury**, Demonstrator (Teaching assistant)
BIOL313: Advanced Microbiology
- 2018 **University of Canterbury**, Lab Instructor
ENCH281: Biology for Engineers
- 2017 **University of Canterbury**, Demonstrator (Teaching assistant)
BIOL213: Microbiology and Genetics
- 2016 **ETH**, Teaching assistant
551-0104-00L: Fundamentals of Biology II, Plant Physiology
- 2014 **Pontificia Universidad Católica de Chile**, Teaching assistant
BIO225C: Plant Physiology and Biochemistry
BIO364C: Industrial Biotechnology
- 2013 **Pontificia Universidad Católica de Chile**, Teaching assistant
BIO266E: Laboratory of Biochemistry II: Molecular Genetics
BIO257C: Biochemistry
BIO225C: Plant Physiology and Biochemistry
- 2012 **Pontificia Universidad Católica de Chile**, Teaching assistant
BIO257C: Biochemistry

Supervision

2022–2023	Salome Duchs, MSc thesis, Remus-Emsermann Lab, Freie Universität Berlin (Co-supervision)
2022–2023	Michael Kunzler, BSc thesis, Remus-Emsermann Lab, Freie Universität Berlin (Co-supervision)
2022	Laura Voß, BSc thesis, Remus-Emsermann Lab, Freie Universität Berlin (Co-supervision)
2021–2022	Ronaldo Heta, BSc thesis, Remus-Emsermann Lab, Freie Universität Berlin (Co-supervision)
2020–2022	Christian Stocks, MSc thesis, Remus-Emsermann Lab, University of Canterbury (Co-supervision)
2020–2021	Evan Kear, Summer Intern, Remus-Emsermann Lab, University of Canterbury
2019	Christian Stocks, Summer Intern, Remus-Emsermann Lab, University of Canterbury
2018	Dian Muñoz, Summer Intern, Remus-Emsermann Lab, University of Canterbury
2016	Michael Schläfli, Semester Project Student, Plant Cell Biology Group, ETH
2014	Diego Bustos, Semester Project Student, Arce-Johnson Lab, P. Universidad Católica de Chile

Participation in Funded Projects

2019–Present	Bioprotection Core New Initiative Fund , Associate Investigator
2017–Present	Marsden Fast-Start Grant, Royal Society of New Zealand , Ph.D. student
Apr 2014–Feb 2015	Fundación para la Innovación Agraria , Research Assistant
Jan 2013–May 2014	Consorcio Tecnológico de la Fruta, ASOEX and Pontificia Universidad Católica de Chile , Research student

Reviewer Activity

ISME Journal, Phytobiomes, Basic and Applied Ecology, AMB Express

Publications

Peer-reviewed Papers

- Huerta, AI, Sancho-Andrés, G, Montesinos, JC, Silva-Navas, J, Bassard, S, Pau-Roblot, C, Kesten, C, **Schlechter, RO**, Dora, S, Ayupov, T, Pelloux, J, Santiago, J, Sánchez-Rodríguez, C (2023). "The WAK-like protein RFO1 acts as a sensor of the pectin methylation status in Arabidopsis cell walls to modulate root growth and defense". *Molecular Plant*.
- Schlechter, RO**, Kear, EJ, Bernach, M, Remus, DM, Remus-Emsermann, MNP (2023). "Metabolic resource overlap impacts competition among phyllosphere bacteria". *The ISME Journal*.
- Stocks, C, **Schlechter, RO**, Remus-Emsermann, MNP (2022). "Chromatic Bacteria v.2-A Himar1 Transposon-Based Delivery Vector to Extend the Host Range of a Toolbox to Fluorescently Tag Bacteria". *Bacteria*.
- Schlechter, RO**, Kear, EJ, Remus, DM, Remus-Emsermann, MNP (2021). "Fluorescent Protein Expression as a Proxy for Bacterial Fitness in a High-Throughput Assay". *Applied and Environmental Microbiology*.
- Miebach, M, **Schlechter, RO**, Clemens, J, Jameson, PE, Remus-Emsermann, MNP (2020). "Litterbox—a gnotobiotic zeolite-clay system to investigate Arabidopsis–microbe interactions". *Microorganisms* 84.
- Jameson, PE, Dhandapani, P, Song, J, Zatloukal, M, Strnad, M, Remus-Emsermann, MNP, **Schlechter, RO**, Novák, O (2019). "The cytokinin complex associated with *Rhodococcus fascians*: which compounds are critical for virulence?" *Frontiers in Plant Science* 10, p. 674.
- Oso, S, Walters, M, **Schlechter, RO**, Remus-Emsermann, MNP (2019). "Utilisation of hydrocarbons and production of surfactants by bacteria isolated from plant leaf surfaces". *FEMS Microbiology Letters* 3666.
- Schlechter, RO**, Miebach, M, Remus-Emsermann, MNP (2019). "Driving factors of epiphytic bacterial communities: A review". *Journal of Advanced Research* 19, pp. 57–65.
- Schlechter, RO**, Remus-Emsermann, MNP (2019). "Delivering "Chromatic bacteria" fluorescent protein tags to *Proteobacteria* using conjugation." *Bio-protocol* 9, e3199.
- Remus-Emsermann, MNP, **Schlechter, RO** (2018). "Phyllosphere microbiology: at the interface between microbial individuals and the plant host". *New Phytologist* 2184, pp. 1327–1333.
- Schlechter, RO**, Jun, H, Bernach, M, Oso, S, Boyd, E, Muñoz-Lintz, DA, Dobson, RCJ, Remus, DM, Remus-Emsermann, MNP (2018). "Chromatic Bacteria – a broad host-range plasmid and chromosomal insertion toolbox for fluorescent protein expression in bacteria". *Frontiers in Microbiology* 9, p. 3052.
- Agurto, M*, **Schlechter, RO***, Armijo, G, Solano, E, Serrano, C, Contreras, RA, Zúñiga, GE, Arce-Johnson, P (2017). "RUN1 and REN1 pyramiding in grapevine (*Vitis vinifera* cv. Crimson seedless) displays an improved defense response leading to enhanced resistance to powdery mildew (*Erysiphe necator*)". *Frontiers in Plant Science* 8, p. 758.
- Armijo, G*, **Schlechter, RO***, Agurto, M, Muñoz, D, Nuñez, C, Arce-Johnson, P (2016). "Grapevine pathogenic microorganisms: understanding infection strategies and host response scenarios". *Frontiers in Plant Science* 7, p. 382.
- Wong, DCJ*, **Schlechter, RO***, Vannozzi, A, Höll, J, Hmam, I, Bogs, J, Tornielli, GB, Castellarin, SD, Matus, JT (2016). "A systems-oriented analysis of the grapevine R2R3-MYB transcription factor family uncovers new insights into the regulation of stilbene accumulation". *DNA Research* 235, pp. 451–466.

15. Cavallini, E, Matus, JT, Finezzo, L, Zenoni, S, Loyola, R, Guzzo, F, **Schlechter, RO**, Ageorges, A, Arce-Johnson, P, Tornielli, GB (2015). "The phenylpropanoid pathway is controlled at different branches by a set of R2R3-MYB C2 repressors in grapevine". *Plant Physiology* 1674, pp. 1448–1470.
16. Espinoza, C, **Schlechter, RO**, Herrera, D, Torres, E, Serrano, A, Medina, C, Arce-Johnson, P (2013). "Cisgenesis and intra-genesis: new tools for improving crops". *Biological Research* 46, pp. 323–331.

* Equal contribution

Book Chapters

17. Armijo, G, Espinoza, C, Loyola, R, Restovic, F, Santibáñez, C, **Schlechter, RO**, Agurto, M, Arce-Johnson, P (2016). "Grapevine biotechnology: molecular approaches underlying abiotic and biotic stress Responses". In: *Grape and Wine Biotechnology*. Ed. by A Morata, I Loira. Rijeka, Croatia: IntechOpen.
18. Meyer-Regueiro, C, **Schlechter, RO**, Espinoza, C, Bisquertt, A, Aquea, F, Arce-Johnson, P (2015). "Boron stress in grapevine: Current developments and future prospects". In: *Grapevines in a Changing Environment: Molecular, Biochemical and Physiological Adaptations*. Ed. by H Gerós, M Chaves, H Gil, S Delrot. Chichester, UK: John Wiley & Sons, Ltd.

Conference Participation

2023	Poster presentation , Plant Microverse Symposium, Jena, Germany
2022	Poster presentation , 4th VAAM Meeting Microbial Cell Biology, Berlin, Germany
2021	Oral presentation , Phyllosphere Fortnight (UC Davis), Online Conference
2020	Oral presentation , New Zealand Microbiology Society (NZMS) Online Conference
	Oral presentation , New Zealand Microbial Ecology Consortium Meeting (NZMEC) 6.0, Auckland, New Zealand
2019	Oral presentation , NZMS Annual Conference, Palmerston North, New Zealand
	Oral presentation , Canterbury Omics Symposium VIII, Christchurch, New Zealand
2018	Poster presentation , NZMS-NZSBMB Joint Annual Conference, Dunedin, New Zealand
	Oral presentation , Canterbury Omics Symposium VII, Christchurch, New Zealand
	Poster presentation , NZMEC5.0, Auckland, New Zealand
Pre-2018	Poster presentation , D-BIOL ETHZ Symposium IX, Davos, Switzerland (2016)
	Oral presentation , Plant Biology Annual Conference IX, La Serena, Chile (2014)
	Poster presentation , Panamerican Association for Biochemistry and Molecular Biology Congress XII, Puerto Varas, Chile (2013)
	Poster presentation , International Symposium of Grapevine Physiology and Biotechnology IX, La Serena, Chile (2013)

Technical Skills

Programming	R, Bash, Python, AT X, Git
Imaging Processing	Photoshop, Illustrator, FIJI/ImageJ
Spatial statistics	Point-pattern analysis
Microscopy	Fluorescence, Confocal (Laser Scanning, Spinning Disk) Microscopy

Languages

Spanish	Native proficiency
English	Professional proficiency
German	Intermediate proficiency (B1)

References

Prof. Mitja Remus-Emsermann, Ph.D.  Freie Universität Berlin, Berlin, Germany	 m.remus-emsermann@fu-berlin.de  +49 30 838 58031
Prof. Emerita Paula Jameson, ONZM, Ph.D.  University of Canterbury, Christchurch, New Zealand	 paula.jameson@canterbury.ac.nz  +64 33 69 5181
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