Curriculum Vitae

Rudolf Schlechter (he | him)

Ph.D. | Microbiologist

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Google Scholar (*h*-index = 9.0)
Chilean and German

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 12 peer-reviewed publications and 2 book chapters on topics related to plant biology and microbiology. My research has been cited 602 times and both my h-index and i10-index are 9.0.

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, Licenciate** *Biochemistry* (M.Sc. equivalent)
Thesis: "Characterisation of the immune response conferred by the *loci RUN1* and *REN1* in *Vitis vinifera* against *Erysiphe necator*"
Senior Supervisor: Prof. P. Arce-Johnson

2009–2013 **Pontificia Universidad de Chile, B.Sc.** *Biochemistry*

Research Experience

May 2017-Jul 2021 **University of Canterbury, Remus-Emsermann Lab**, Ph.D. student
– *Bacterial genetic modification*: Development of a genetic toolbox for the stable labelling of *Proteobacteria* with fluorescent proteins
– *Genomics*: Reconstruction and analysis of genome-scale metabolic models to study metabolic relationships between phyllosphere bacteria
– *Factors driving species interactions and spatial distribution patterns*: Combination of *in vitro* and *in planta* 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 *Arabidopsis thaliana* phyllosphere
– *Single-cell bioreporters*: Use of CUSPER bioreporter in *Pantoea eucalypti* 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
– *Plant-pathogen interactions*: Gene expression analysis of grapevine response to the infection of powdery mildew
– *Capillary electrophoresis*: 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
– *Role of endocytosis in plant-pathogen interactions*: Live-cell imaging of *Arabidopsis thaliana* root endocytic and vesicular trafficking response against *Fusarium oxysporum*
– *Calcium imaging*: Live-cell imaging of calcium dynamics in arabidopsis roots with the fluorescent biosensor R-GECO1 and the microfluidic platform RootChip. *Visiting scholar at COS, University of Heidelberg. Schumacher and Grossmann Lab*

Apr 2014–Feb 2015 **AgriJohnson Ltd.**, Research Assistant
– *Grapevine virus detection platform*: Development of a simultaneous detection of grapevine viruses in *Vitis vinifera* through multiplex PCR
– *Tissue culture*: 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

Semester 2 2021	**University of Canterbury**, Guest Lecturer BIOL313: Advanced Microbiology
Semester 2 2020	**University of Canterbury**, Demonstrator (Teaching assistant) BIOL313: Advanced Microbiology
Semester 2 2019	**University of Canterbury**, Demonstrator (Teaching assistant) BIOL313: Advanced Microbiology
Semester 2 2018	**University of Canterbury**, Lab Instructor ENCH281: Biology for Engineers
Semester 2 2017	**University of Canterbury**, Demonstrator (Teaching assistant) BIOL213: Microbiology and Genetics
Semester 1 2016	**ETH**, Teaching assistant 551-0104-00L: Fundamentals of Biology II, Plant Physiology
Semester 1 2014	**Pontificia Universidad Católica de Chile**, Teaching assistant BIO225C: Plant Physiology and Biochemistry BIO364C: Industrial Biotechnology
Semester 2 2013	**Pontificia Universidad Católica de Chile**, Teaching assistant BIO266E: Laboratory of Biochemistry II: Molecular Genetics
Semester 1 2013	**Pontificia Universidad Católica de Chile**, Teaching assistant BIO257C: Biochemistry BIO225C: Plant Physiology and Biochemistry
Semester 1 2012	**Pontificia Universidad Católica de Chile**, Teaching assistant BIO257C: Biochemistry

Supervision

2020–Present	Christian Stocks, M.Sc. student, Remus-Emsermann Lab, University of Canterbury (Co-supervision)
2020–2021	Evan Kear, Undergraduate summer intern, Remus-Emsermann Lab, University of Canterbury
2019	Christian Stocks, Undergraduate 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-Johnsoh Lab, Pontificia 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

Phytobiomes, Basic and Applied Ecology, AMB Express, New Phytologist, Biology

Publications

Pre-prints

1. Stocks, C, **Schlechter, RO**, Remus-Emsermann, MNP (2021). “Chromatic bacteria v.2 - A Himar1 transposon based delivery vector to extend the host range of a toolbox to fluorescently tag bacteria”. *bioRxiv*.

Peer-reviewed Papers

2. **Schlechter, RO**, Kear, EJ, Remus, DM, Remus-Emsermann, MNP (2021). “Fluorescent protein expression as a proxy of bacterial fitness in a high throughput assay”. *Applied and Environmental Microbiology*. DOI: 10.1128/AEM.00982-21.
3. 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.
4. 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.
5. 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.
6. **Schlechter, RO**, Miebach, M, Remus-Emsermann, MNP (2019). “Driving factors of epiphytic bacterial communities: A review”. *Journal of Advanced Research* 19, pp. 57–65.
7. **Schlechter, RO**, Remus-Emsermann, MNP (2019). “Delivering “Chromatic bacteria” fluorescent protein tags to *Proteobacteria* using conjugation.” *Bio-protocol* 97, e3199.
8. Remus-Emsermann, MNP, **Schlechter, RO** (2018). “Phyllosphere microbiology: at the interface between microbial individuals and the plant host”. *New Phytologist* 2184, pp. 1327–1333.
9. **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.
10. 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.
11. 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.
12. Wong, DCJ*, **Schlechter, RO***, Vannozzi, A, Höll, J, Hmmam, 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.
13. 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.
14. Espinoza, C, **Schlechter, RO**, Herrera, D, Torres, E, Serrano, A, Medina, C, Arce-Johnson, P (2013). “Cisgenesis and intragenesis: new tools for improving crops”. *Biological Research* 46, pp. 323–331.

* Equal contribution

Book Chapters

15. 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.
16. 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

2021	**Oral presentation**, Phyllosphere Fortnight 2021 Online Conference
2020	**Oral presentation**, New Zealand Microbiology Society (NZMS) Online Conference, New Zealand
	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, Unix, LaTeX
Imaging Processing	Photoshop, Illustrator, FIJI/ImageJ
Spatial statistics	DAIME
Microscopy	Fluorescence, Confocal (Laser Scanning, Spinning Disk) Microscopy

Languages

Spanish	Native proficiency
English	Professional proficiency (C1 — TOEFL score: 110, 2017)
German	Basic proficiency (A2)

References

Prof. Mitja Remus-Emsermann, Ph.D.
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Prof. Emerita Paula Jameson, ONZM, Ph.D.
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