Florian LAMOUCHE – PhD

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INRAE Researcher
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Research interests

Plant-microbiome interactions and microbiome engineering

Bacterial genetics

Bacterial and Plant physiology

Biological Nitrogen fixation

Professional experiences

2024-present MSCA Postdoctoral fellow, INRAE, Emersys team, Beaucouzé, France
Project: Opening the black box of microbial interactions: Microbiome editing on seed natural microbial communities (SEEDITING). PI: Dr. Alain Sarniguet

2020-2024 Postdoctoral researcher, Department of Molecular Biology and Genetics, Aarhus University, Denmark.
Project: Deciphering competitiveness of root colonizers with the use of Synthetic Communities.
PI: Prof. Simona Radutoiu

2019-2020 Full time biology teacher at Versailles University (UVSQ), France

2015-2019 PhD student, Institute of Integrative Biology of the Cell (I2BC), UMR 9198 Gif sur Yvette, France.
Project: Comparative analysis of bacteroid differentiation mechanisms in *Bradyrhizobium-Aeschynomene* symbioses. PI: Dr. Peter Mergaert

Education

2014-2015 Master's Degree (M2) in Biosciences, École Normale Supérieure de Lyon, France

2013-2014 Professional Master's in Teaching, École Normale Supérieure de Lyon, France
Agrégation in Biology-Geology (SV-STU), 2014

2012-2013 Master's Degree (M1) in Biosciences, École Normale Supérieure de Lyon, France
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2011-2012 Bachelor's Degree in Biosciences, École Normale Supérieure de Lyon, France

2008-2011 Preparatory Classes for the French Grandes Écoles (BCPST), Lycée Henri Poincaré, Nancy, France

Congress Participation

- 5th Plant Microbiome Symposium (**2024**). Poster
- European Nitrogen Fixation Congress, Naples (**2023**). Oral presentation and Poster
- Copenhagen Bioscience Conference: Plant Microbe Interactions (**2022**). Denmark. Poster
- Collaborative Crop Resilience Program annual meeting (**2021-2024**). Denmark. Oral Presentations
- European Nitrogen Fixation Congress, Stockholm, Sweden **(2018)**. Oral presentation
- 5th Meeting on Molecular Mechanisms in Nitrogen-Fixing Root Endosymbioses, Symbifix Network, France (**2017**). Oral presentation and Poster
- 3rd Adam Kondorosi Symposium Frontiers in Beneficial Plant-Microbe Interactions, France (**2017**). Poster
- European Plant Science Retreat, Barcelona, Spain (**2016**). Poster
- 12th Plant Bacteria Meeting, Aussois, France (**2016**). Oral presentation

Grant Funding

2024-2026 Marie Skłodowska-Curie Actions Postdoctoral Fellowship (211,000 €)

Teaching

2019-2020 Université de Versailles Saint-Quentin-en-Yvelines (384h+). Course coordinator : Cell Biology and Cellular Communication: Nervous, Hormonal, and Immune Systems (L2). Instructor for practicals and tutorials: Biodiversity (L1), From Gene to Protein (L1), Biochemical Transformations and Energy (L2), Cellular Communication (L2), Biochemistry (M1). Responsible for the remedial course From Gene to Protein (L1).

2015-2018 Université Paris-Saclay, Préparation aux Cursus Scientifiques d'Orsay (PCSO) (64h/year). Instructor for Cellular and Molecular Biology lessons in the external Agrégation preparation center of Orsay (M2, 4h/year).

Student Supervision

- Research Technician: Zuzana Blahovska
- MSc students (1st year): Célia Seegmüller (2024) Tu Phuong Huynh (2022), Solenn Tuffigo (2017)
- BSc students: Elisabetta Signorini (2023), Nolwenn Bonade Bottino (2016), Stacy Simoes (2016)

List of Publications

(Co)-First author:

- Selten G., **Lamouche F.**, Gómez-Repollés A., Blahovska Z., Kelly S., de Jonge R. and Radutoiu S. (2024), Functional capacities drive recruitment of bacteria into plant root microbiota. *bioRxiv* 2024.08.22.609090; doi: https://doi.org/10.1101/2024.08.22.609090

- Nicoud, Q., **Lamouche, F.**, Chaumeret, A., Balliau, T., Le Bars, R., Bourge, M., et al. (2021) *Bradyrhizobium diazoefficiens* USDA110 nodulation of *Aeschynomene afraspera* is associated with atypical terminal bacteroid differentiation and suboptimal symbiotic efficiency. *mSystems* **11**:6(3):e01237-20

- **Lamouche, F.**, Bonadé-Bottino, N., Mergaert, P., and Alunni, B. (2019a) Symbiotic efficiency of spherical and elongated bacteroids in the *Aeschynomene-Bradyrhizobium* symbiosis. *Front Plant Sci* **10**:377

- **Lamouche, F.**, Gully, D., Chaumeret, A., Nouwen, N., Verly, C., Pierre, O., et al. (2019b) Transcriptomic dissection of *Bradyrhizobium* sp. strain ORS285 in symbiosis with *Aeschynomene* spp. inducing different bacteroid morphotypes with contrasted symbiotic efficiency. *Environ Microbiol* **21**: 3244–3258

- **Lamouche, F.**, Chaumeret, A., Guefrachi, I., Barrière, Q., Pierre, O., Guérard, F., et al. (2019c) From intracellular bacteria to differentiated bacteroids: transcriptome and metabolome analysis in *Aeschynomene* nodules using the *Bradyrhizobium* sp. strain ORS285 *bclA* mutant. *J Bacteriol* **201**: e00191-19

Co-author:

- Selten G., Gómez-Repollés A., **Lamouche F.**, Radutoiu S. and de Jonge R. (2025) SyFi: generating and using sequence fingerprints to distinguish SynCom isolates. *bioRxiv* 2025.02.27.640502; doi: https://doi.org/10.1101/2025.02.27.640502
- Ohbayashi, T., Futahashi, R., Terashima, M., Barrière, Q., **Lamouche, F.**, Takeshita, K., et al. (2019) Comparative cytology, physiology and transcriptomics of *Burkholderia insecticola* in symbiosis with the bean bug *Riptortus pedestris* and in culture. *ISME J* **13** 1469–1483

- Gonzalez-Mula, A., Lachat, J., Mathias, L., Naquin, D., **Lamouche, F.**, Mergaert, P., and Faure, D. (2019) The biotroph *Agrobacterium tumefaciens* thrives in tumors by exploiting a wide spectrum of plant host metabolites. *New Phytol* **222**: 455–467

- Kazmierczak, T., Nagymihály, M., **Lamouche, F.**, Barrière, Q., Guefrachi, I., Alunni, B., et al. (2017) Specific host-responsive associations between *Medicago truncatula* Accessions and *Sinorhizobium* Strains. *Mol Plant-Microbe Interact* **30**: 399–409

- Barrière, Q., Guefrachi, I., Gully, D., **Lamouche, F.**, Pierre, O., Fardoux, J., et al. (2017) Integrated roles of BclA and DD-carboxypeptidase 1 in *Bradyrhizobium* differentiation within NCR-producing and NCR-lacking root nodules. *Sci Rep* **7**: 1–13

- Alais, S., Glaize, A., Cachat, A., **Lamouche, F.**, Mahieux, R., and Dutartre, H. (2014) Distinct DC subsets are not equally susceptible to HTLV-1 infection. *Retrovirology* **11**: O20