ROMAIN DARNAJOUX

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CURRENT POSITION

Princeton University, Geosciences Department — Princeton, NJ, USA
Simons Foundation Postdoctoral Fellow of the LSRF (2016) — Nov 2016-Present

EDUCATION

Université de Sherbrooke, Chemistry department — Sherbrooke, QC, Canada
PhD, Biogeochemistry — 2011-Aug 2015

National Graduate School of Chemistry of Lille (ENSCL) — Lille, France
MSc, Chemistry — 2006-2010

François Ier College — Fontainebleau, France
CPGE Biology (French undergraduate selective program, equivalent to BSc) — 2004-2006

HONORS AND AWARDS

2016 Life Science Research Foundation Postdoctoral Fellowship — 2016-2019
Sponsor: Simons Foundation

Registration fellowship "*12th Workshop on Cyanobacteria*", (Tempe, AZ, USA) — 2016

Honor's list of the Dean, Ph.D. Thesis, Faculty of Sciences, Université de Sherbrooke — 2015

Chapitre Saint-Laurent Awards — 2015
- Science vulgarization video competition, public prize
- Science vulgarization video competition, jury prize
  Video in french here (or https://www.youtube.com/watch?v=V5mmET-T1f8)
- Excellence certificate

"Gene H. Kruger" Excellence Award — 2014

RESEARCH EXPERIENCE

Princeton University, Geosciences department — Princeton, NJ, USA
LSRF Postdoctoral Fellow — Nov 2016-Present
Co-advisors: François Morel & François Lutzoni (Duke University)
"Deciphering the genomic and metabolic heterogeneity of biological nitrogen fixation in boreal ecosystems"

Université de Sherbrooke, Biology department — Sherbrooke, QC, Canada
Postdoctoral researcher. Advisor: Robert Bradley — Sept. 2015-Sept. 2016
"Studying the interaction of global changes with the N cycle in boreal ecosystems"
- Studied N dynamics in boreal forest
- Coordinated field works, helped graduate students

Université de Sherbrooke, Chemistry department Sherbrooke, QC, Canada
PhD, Biogeochemistry. Advisor: J-P Bellenger 2011-2015
"Homeostasis of essential micronutrient for biological nitrogen fixation in the boreal trimembered cyanolichen *Peltigera aphthosa*".
- Developed analytical procedures for the study of micronutrients in trimembered cyanolichens.
- Studied the impact of temperature on Nase isozymes using ARACAS.

University of Kent, Biosciences Department Canterbury, England
MSc project. Advisor: G.K. Robinson, M.J. Howard Apr. 2010-Oct. 2010
"Toward the use of STD-NMR for ligand/microbial cell interaction."
- Evaluated the use of STD-NMR to probe interaction between HSL / *Pseudomonas aeruginosa* cells using enzymatic model.
- Studied efflux pump in *Pseudomonas aeruginosa* with fluorescent molecule

SKILLS AND TECHNICS

- ICP-MS maintenance and analysis
- Analytical method development for biological systems
- Biological nitrogen fixation measurement methods: **Cavity ring-down spectroscopy**, ^{15}N tracer, acetylene reduction assays.
- Multivariate and univariate statistical analysis (R software)

TEACHING EXPERIENCE

Université de Sherbrooke Sherbrooke, QC, Canada
Biology department
- Soil biology, (BSc., Prof. Bradley), 1h invited course 2015
  "Deciphering the ecological importance of V-based nitrogen fixation in boreal ecosystems."

Chemistry department
- Analytical chemistry practical (BSc, Prof. Brisard), 4h course 2013-2015
  "Error measurement and statistics. " Designed and taught course.
- Analytical chemistry (BSc, Prof. Segura), 2h invited course. 2014-2015
  "Element quantification in biological tissues with Inductively-coupled plasma mass spectrometry. Theory and application. " Designed and taught course.

RELATED PROFESSIONAL EXPERIENCE

Mini FACE project Sherbrooke, QC, Canada
Coordinator: 2015-2016
- Serviced the facility
- Managed students experiments

Paris Descartes University, Practical chemistry laboratory Paris, France
Lab manager: Dec. 2010-Aug. 2011
- Managed 2 technicians, serviced analytical equipment,
- Allocated annual budget (40000€)

RELEVANT ADDITIONNAL SKILLS

Trainings

Paris Descartes University, Hygiene and security counsellor (ACMO), 6 days 2010

Leadership experience

Student office of National Graduate School of Chemistry (ENSCL) Lille, France
Head of the student office: 2007-2008
- Managed 8 persons
- Allocated annual budget (10000€)

Regional office of engineering student of Nord-Pas-de-Calais Lille, France
Internal relation coordinator 2007-2008

Hygiene and Security Council, ENSCL Lille, France
Elected student representative 2008-2010

Regional Student Affair Council (CROUS, Nord-Pas-de-Calais) Lille, France
Elected substitute representative at the council board, 2008-2009

Languages

French (mother tongue), English (fluent), Japanese (common knowledge, 2 months internship in production quality control, Tajimi, Japan)

PUBLICATIONS

Published articles

Darnajoux, R., Zhang, X., McRose, D., Miadlikowska,J., Lutzoni, F., Kraepiel, A.M.L, & Bellenger, J. P. (2017) Alternative nitrogenase contribute to biological nitrogen fixation in boreal cyanolichens. *New Phytologist*, 213(2), 680-89, doi: 10.1111/nph.14166

Zhang, X., McRose, **Darnajoux, R.**, Bellenger, J. P., Morel, F.M.M., & Kraepiel, A.M.L. (2016) Alternative nitrogenase activity in the environment and nitrogen cycle implications. *Biogeochemistry*, 127(2), 189-98, doi:10.1007/s10533-016-0188-6.

Jouogo-Noumsi, C., Pourhassan, N., **Darnajoux, R.,** Deicke, M., Wichard, T., Burrus, V. & Bellenger, J. P. (2016) Effect of organic matter on nitrogenase metal cofactor homeostasis in *Azotobacter vinelandii* under diazotrophic condition. *Environmental Microbiology Report*, 8, 76–84 doi:10.1111/1758-2229.12353

Darnajoux, R., Lutzoni, F., Miadlikowska, J., & Bellenger, J. P. (2015). Determination of elemental baseline using peltigeralean lichens from Northeastern Canada (Québec): Initial data collection for long term monitoring of the impact of global climate change on boreal and subarctic area in Canada. *Science of the Total Environmen*t, 533, 1-7.

Darnajoux, R., Constantin, J., Miadlikowska, J., Lutzoni, F., & Bellenger, J. P. (2014). Is Vanadium a Biometal for Boreal Cyanolichen. *New Phytologist*, 202(3), 765-71.

Allard, P., **Darnajoux, R**., Phalyvong K., & Bellenger J.P. (2013). Effects of tungsten and titanium oxide nanoparticles on the diazotrophic growth and metals acquisition by *Azotobacter vinelandii* under molybdenum limiting condition. *Environmental Science & Technology*, 47(4), 2061–2068.

Submitted manuscript

Manuscripts in preparation (to be submitted by 2016)

Darnajoux, R., & Bellenger, J.-P. Temperature dependency of molybdenum and vanadium nitrogenase in *Anabaena variabilis*. Target journal: *Environmental Science and Technology*.

INVITED SPEAKER

ESGSA Special Seminar, Rudgers University, NJ, USA, (2014) "Deciphering the ecological importance of V-based nitrogen fixation in boreal ecosystems."

EGGS Lecture series, Princeton University, NJ, USA, (2014) "Deciphering the ecological importance of V-based nitrogen fixation in boreal ecosystems."

CONFERENCE PRESENTATIONS

(*speaker)

Darnajoux, R.*, Zhang, X., McRose, D., Miadlikowska, J., Kraepiel, A., Lutzoni, F., Bellenger, J.-P. "The importance of vanadium-based nitrogen fixation in boreal cyanolichens: a case study using Peltigera aphthosa (L.) Willd. s. l.". Poster presentation delivered at the *8th International Association of Lichenology Symposium, Helsinki, Finland* (August 2016)

Darnajoux, R.*, Bradley Robert and Bellenger, J.-P. "In vivo characterization of nitrogenase kinetics in *Anabaena variabilis* ATCC 29413 using cavity ring-down spectroscopy". Oral presentation delivered at the *12th Workshop on Cyanobacteria, Tempe, AZ, USA* (May 2016)

Darnajoux, R.*, Houle, D., Bellenger, J.-P and Bradley Robert. "Fixation d'azote dans les pessières à mousse : Quand la couleur importe !". Oral presentation delivered at the *10ème Colloque du Centre d'Étude de la Forêt, Montréal, Qc, Canada* (May 2016)

Jouogo Noumsi C*., **Darnajoux R.**, Pourhassan N., Deicke M., Wichard T., Burrus V. and Bellenger J.P. "Effect of natural organic matter on metal acquisition and nitrogenase use by *Azotobacter vinelandii".* Oral presentation delivered at the *International Symposium on Interactions of Soil Minerals with Organic Components and Microorganisms (ISMOM), Montréal, Qc, Canada*. (July 2015)

Darnajoux, R.*, Miadlikowska, J., Lutzoni, F. and Bellenger, J.-P. "Le grand nord québécois demeure l'une des regions les moins contaminées en métaux de la planète". Oral presentation delivered at the *19ème Colloque annuel du Chapitre Saint-Laurent, Sherbrooke, Qc, Canada.* (June 2015)

Darnajoux, R.*, H.Morin, Z. Lindo, R.Bradley and Bellenger, J.-P. "The boreal mini-face project; l'effet des changement globaux sur la fixation biologique de l'azote en forêt boréale". Poster presentation delivered at the *19ème Colloque annuel du Chapitre Saint-Laurent, Sherbrooke, Qc, Canada.* (June 2015)

Darnajoux R., Miadlikowska J., Lutzoni F. and Bellenger J.P.* "Metal homeostasis in the foliose lichen *Peltigera aphthosa* from northern hemisphere." Poster presentation delivered at the *European Geology Union, General Assembly, Vienna, Austria* (July 2014).

Darnajoux, R.*, Miadlikowska, J., Lutzoni, F. and Bellenger, J.-P. "The importance of vanadium-based nitrogen fixation in boreal ecosystems: a case study using the tri-membered lichen *Peltigera*

aphthosa". Oral presentation delivered at the *18ème Colloque annuel du Chapitre Saint-Laurent, Québec, Qc, Canada.* (June 2014)

Jouogo Noumsi C*., **Darnajoux R.**, Pourhassan N., Deicke M., Wichard T., Burrus V. and Bellenger J.P. *"*Effect of natural organic matter on metal acquisition and nitrogenase use by *Azotobacter vinelandii".* Poster presentation delivered at the American Society of Microbiology, General Meeting, Boston, MA, USA. (May 2014)

Darnajoux, R.*, Bellenger, J-P. (2014). "Investigating temperature dependency of nitrogen fixation in cyanobacteria using acetylene reduction assay cavity ring-down laser absorption spectroscopy (ARACAS)." Poster presentation delivered at the *Mer Bleue Workshop, McGill University, Montréal, Qc, Canada*. (March 2014)

Darnajoux, R.*, Miadlikowska, J., Lutzoni, F. and Bellenger, J.-P. "Determination of baseline contamination of foliose lichens in Eastern Canada (Québec)" Oral presentation delivered at the *96th Canadian Chemistry Conference, Québec, Qc, Canada.* (May 2013)

Bellenger, J.-P.*, **Darnajoux, R**, Hodkinson, B., Miadlikowska, J., and Lutzoni, F. "Metal homeostasis in the tri-membered lichen *Peltigera aphthosa*: another demonstration of the potential importance of vanadium to N_2 fixation worldwide." Oral presentation delivered at the *96th Canadian Chemistry Conference, Québec, Qc, Canada.* (May 2013)

Allard P.*, Bellenger J.P., **Darnajoux R**., Phalyvong K. "Influence de nanoparticules métalliques sur la fixation d'azote par *Azotobacter vinelandii*." Poster presentation delivered at the *16eme Colloque annuel du Chapitre Saint-Laurent, Québec, Qc, Canada.* (June 2012)