Post-Doc fellowship available from March 2017 at the Microbial Ecology Centre of Lyon University (France) - in collaboration with the Institut of Ecology and Environmental Sciences of Paris (France)

Project: Modelling the relationships between plants and soil nitrifiers and denitrifiers: application to wheat varieties cultivated as monocultures or assemblages

Background: In the 20th century, agriculture has experienced major gains in productivity via homogenization and intensive use of chemical inputs. This approach is jeopardized by the awareness of rapid global change, increased environmental stochasticity and the need for greater sustainability of agriculture. A new paradigm is emerging, in which biodiversity and the mechanisms underlying its dynamics are considered assets for a sustainable agriculture relying more on ecological functions and diversity within agroecosystems. **Plant and soil microbial diversity should play an essential role in this context, as key elements contributing to agriculture multi-functionality** and to the resilience of agroecosystems under rapid climate change and decreased chemical inputs. The main goal of the WHEATAMIX project (http://www6.inra.fr/wheatamix_eng/) is to better evaluate the possible roles of within-crop diversity to reinforce the multi-functionality and resilience of cropping systems under global change. WHEATAMIX focuses on a major cereal, wheat.

The main goal of this 16 to 18 months Post-Doc fellowhip is to use **modelling approaches to analyse the relationships between (i) the functioning, abundance and diversity of soil nitrifying and denitrifying communities and (ii) the functional traits of wheat varieties cultivated as monocultures or assemblages**. This will allow a better understanding of plant-(de)nitrifiers interactions, and of the role of wheat varieties and associated soil microbial communities on soil fertility.

This will build on the results obtained in a large scale, in situ experiment performed in 2015 and 2016, and a greenhouse experiment performed in 2016, which allowed studying the microorganisms involved in soil N dynamics in wheat fields, covering a wide range of wheat variety diversity. The Post-Doc fellow will develop/amend and apply modelling approaches for exploring the links between plant functional traits and the characteristics of the soil (de)nitrifying communities.

The work will mainly take place at the Microbial Ecology Centre of Lyon, in the team "Microbial functional diversity and N cycle" (http://www.ecologiemicrobiennelyon.fr/spip.php?rubrique31&lang=en). It will be achieved in collaboration with the Institut of Ecology and Environmental Sciences of Paris (https://ieesparis.ufr918.upmc.fr/).

Fellowship details: The official starting date for the post-doctoral fellowship will be around 1^{rst} March 2017. The selected candidate will be based at the Microbial Ecology Centre of University of Lyon I-CNRS-INRA, France, and will have to also spend some time at IEES in Paris. He/she will be supervised by X. Le Roux (LEM; www.researchgate.net/profile/X_Roux/), co-supervised by S. Barot and X. Raynaud (IEES) with strong collaboration with A. Cantarel and T. Pommier (LEM). The position is available for 16-18 months.

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Selection details: Applicants must have a PhD in ecology (ecological modelling). Solid knowledge bases on modelling approaches in ecology are essential, and a background in plant/microbes interactions is a plus. Dedication and a creative mind will be important to conduct the project. Good proficiency in English is required (French speaking will not be a selection criterion).

Application: The complete application (single document) in English should include a CV, a list of publications and other productions, a statement of research experiences and technical skills appropriate to the proposed subject, and a list of three potential references. Application should be sent to Xavier Le Roux (Xavier.le-roux@univ-lyon1.fr).

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