



Postdoctoral Research Fellowship in France at INRA, Bordeaux

Identifying the drivers of carbonic anhydrase activity in soils and its impact on soil-atmosphere exchanges of CO¹⁸O and COS, two complementary tracers of the global carbon cycle

Rationale: Rising CO₂ and temperature combined with changes in water availability will modify terrestrial ecosystem photosynthetic uptake and respiratory losses in the near future, but it still remains unclear to what extent. Complementary tracers of the carbon cycle, such as the oxygen isotope composition of CO₂ and carbonyl sulfide (COS) can provide novel insights on ecosystem processes and help constrain large-scale CO₂ budgets. However, mechanistic understanding of how environmental and ecological conditions regulate the exchange rates of these tracers between soils and the atmosphere is currently unknown.

Methodology: Soil gas exchange measurements will be made in several biomes across Europe and beyond by the postdoctoral candidate to measure *in situ* the spatial variability of an important enzyme, carbonic anhydrase (CA). This enzyme catalyses the oxygen isotope exchange of CO₂ in water and generally promotes the uptake of COS in soil microorganisms. The postdoc will also be responsible for compiling a spatial database of CA activity that will be used to investigate the ecological and environmental drivers of the enzyme. The candidate will also work closely with international collaborators to constrain the spatial parameterisation of CA activity in isotope-enabled models required to investigate the impact of soil microorganisms on the δ¹⁸O of atmospheric CO₂ at large scales.

Experience: The successful candidate will have experience in the measurement of environmentally important trace gases (CO₂, H₂O and/or COS) using dynamic gas exchange chambers. A background and experience in using stable isotopes in environmental studies would also be desirable. The postdoc must be willing and able to conduct work in the field within an international team and be available to travel abroad regularly for short term field campaigns. A clean driving licence will also be necessary. Candidates are sought with an interdisciplinary background linking either soil physics, atmospheric chemistry and environmental microbiology. A broad interest in land-atmosphere interactions and ecosystem function is also essential. The candidate will hold a PhD diploma and a strong interest in process-oriented research. The postdoc will also demonstrate a competence in communicating research results at the international level at conferences and in peer-reviewed journals in English.

Wider Context: The postdoctoral candidate will be a key member in a new ERC team based in Bordeaux that will contribute to a quantitative description of CA activity in ecosystems and at the global scale. This interdisciplinary postdoctoral position offers exciting opportunities to generate unique and comprehensive datasets at the interface of atmospheric science and soil microbiology, that will lead to a greater understanding of carbon cycling on Earth. This position offers an experience to work within a dynamic and internationally recognised team working on isotope biogeochemistry and functional microbiology and an opportunity to develop a network with many international collaborators.

Application: Please send your application (CV, letter of motivation, research interests and expertise, list of publications and the names and contact information of two referees) to Lisa Wingate (see below). A 1-yr contract is available immediately from the 1st February 2014 and is renewable for up to 3 years. Salary follows national directives and is adjusted for work experience.

For further information please contact:
Dr Lisa Wingate (lisa.wingate@bordeaux.inra.fr)



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