

Post-doctoral position

Mass spectrometry analysis of phytohormones produced and transported by mycorrhizal fungi

A post-doctoral position is open for a period of 24 months at LRSV (Laboratoire de Recherche en Sciences Végétales, Toulouse, France), as part of an ANR-funded project (April 2019-April 2021).

Research project

Most plants live in symbiosis with Arbuscular Mycorrhizal (AM) fungi. These fungi colonize root cells, and simultaneously develop their mycelium into the soil. This enables them to provide their host plants with otherwise inaccessible mineral nutrients. In natural environments, mycelium networks also frequently connect several host plants together.

The symbiosis involves extensive communication between the plant and fungus, and our group has contributed to identify some of the molecular signals involved (Besserer et al. *PLoS Biology* 2006; Maillet et al. *Nature* 2011). Plant-released symbiotic signals include strigolactones, a group of compounds recently characterized as phytohormones (Gomez-Roldan et al. *Nature* 2008). In addition, we have recently discovered that AM fungi themselves can release several kinds of phytohormones (unpublished data). With this project, we will investigate for the first time on a large scale whether AM fungi are able to produce and transport phytohormones, and whether they use them as internal regulators.

The roles of the post-doctoral fellow will be a) to characterize as comprehensively as possible the set of phytohormones released by AM fungi, b) to determine whether these hormones are biosynthesized in the fungus or acquired from the host plant (through ¹³C-labelling strategies and metabolic flux measurements), and c) to investigate labelled hormone transport/metabolism between plant and fungus in both directions, and possibly between plants through mycelium networks.

Environment

LRSV belongs to the Research Federation FR-AIB and to the TULIP Laboratory of Excellence. These structures include other specialists of plant-microbe interactions and of plant hormone biology. We have access to state-of-the-art mass spectrometry facilities, since LRSV belongs to local and national networks for metabolomics, MetaToul and MetaboHub. The project involves a local company which produces AM-based inoculum. The company will supply the necessary biological material, as well as its expertise for the culture of diverse AM strains. The post-doctoral fellow will work in close collaboration with a PhD student.

Profile

Candidates should hold a PhD in biochemistry. A strong experience in metabolomics and fluxomics using mass spectrometry (LC-MS/MS) is absolutely essential, as the recruited person will have to work autonomously on the mass spectrometers. Experience with plants and phytohormones is highly desirable. Candidates must be able to work both independently and within a team environment, and possess excellent communication skills. A good level of English is required, but a knowledge of French is not essential.

Applications

Candidates are invited to contact Drs Soizic Rochange (rochange@lrsv.ups-tlse.fr) and Virginie Puech-Pagès (puech@lrsv.ups-tlse.fr). Applications should include a cover letter explaining their motivations, a Curriculum Vitae and the e-mail addresses of two referees. Applications will be considered until a suitable candidate is identified. Salary will depend on experience, in the range 21,400 - 28,000 € net per year.