



PostDoc position: PhD Degree in Biochemistry

Research topics: Impact of NRT2.1 posttranslational regulatory mechanisms on nitrate uptake and sensing in *Arabidopsis thaliana*

Research team: position is open at Institute for Plant Sciences of Montpellier (IPSiM, <https://www1.montpellier.inra.fr/wp-inra/bpmp/en/>) in Montpellier (France)

When: Start April 1st 2023

Duration: 36 months

How to apply: Interested candidates should send their Curriculum Vitae in English, motivation letter, and a list of 2 or 3 references to:

Dr. Laurence Lejay
laurence.lejay@inrae.fr

Description :

In *Arabidopsis thaliana*, NRT2.1 is the major component of the root high affinity NO₃⁻ transport system (HATS). Previous results revealed that protein phosphorylation and protein-protein interactions play an important role in regulating root NO₃⁻ HATS activity. Furthermore, NRT2.1 is also involved in the control of lateral root initiation. Since NO₃⁻ is not only a major N source for the plants, but also acts as a signal to modulate plant metabolism and development, this gave rise to the hypothesis that NRT2.1 may also be a sensor, or a signal transducer, modulating root development according to the external NO₃⁻ availability. In this context, a particular focus of this project is to combine proteomics approaches with biochemistry, genetic and plant physiology to study NRT2.1 posttranslational regulatory mechanisms in more detail along with their possible role in NO₃⁻ sensing.

This work will be done in the context of a collaboration between Dr. Laurence Lejay at Institute for Plants Sciences of Montpellier (IPSiM) in Montpellier (France), the group of Dr. Waltraud Schulze Department of Plant Systems Biology, University of Hohenheim (Germany) and Christelle Troadec and Dr. Abdelhafid Bendahmane of the EPITRANS platform in the Institute of Plant Sciences (IPS2) in Paris-Saclay (France). The scientific aim of this collaborative project is (i) to identify phosphorylation-dependent NRT2.1 interaction partners, (ii) to characterize the kinases involved in NRT2.1 phosphorylation and (iii) to determine if NRT2.1 has a role in NO₃⁻ sensing and if it is related to posttranslational regulatory mechanisms.

The post-doc recruited in this project will be in charge of (i) the identification and the characterization of NRT2.1 candidate partner proteins, (ii) conducting the biological and proteomic experiments in collaboration with Schulze lab and EPITRANS platform to find candidate protein kinases for NRT2.1 C-terminus phosphorylation sites and (iii) to characterize the role of NRT2.1 in NO₃⁻ sensing and explore the role of NRT2.1 C-terminus post-translational modifications. Biological experiments in this project will involve molecular biology, RNA-seq, genetic, and mutant characterization using ¹⁵N and confocal microscopy. Proteomic and biochemistry experiments will involve Pull-Down and co-IP assays, Mass Spectrometry, BN-PAGE and Western blots.

Person specification:

The ideal candidate is a plant biologist with a PhD in biochemistry. He/she is expected to have experience in mass spectrometry to work with the staff of the proteomic platform in the Institute for Plant Sciences of Montpellier (IPSiM) and in collaboration with our Partner in Germany. Experience with different types of mass spectrometers would be ideal.