



PhD position available

Adaptive responses of maize roots to water stress: towards a model combining growth and hydraulics

Aquaporin team, CNRS/INRA, Montpellier, France

A position is open to work in the frame of an ERC Advanced project named “HyArchi: Targeting Root Hydraulic Architecture to Improve Crops under Drought“. Research will be carried out in the group of Dr Christophe Maurel in the Biochemistry and Plant Molecular Physiology department (INRA/CNRS/SupAgro, Montpellier, France). This institute and the host group have world-wide recognized records in plant membrane transport and stress physiology (<http://www1.montpellier.inra.fr/ibip/bpmp/>) (Shahzad Z *et al.*, 2016, *Cell* 167:87, Rodrigues *et al.*, 2017, *PNAS* 114: 9200).

The HyArchi project will focus on maize roots under water stress with the ultimate goal of optimizing water uptake. It will explore novel aspects of their plasticity and provide a multidimensional understanding of their water transport function, by considering the integration of hydraulic, growth and signalling processes within root architecture.

The specific aim of the PhD project will to describe with an unprecedented spatial and temporal resolution the hydraulic and growth processes occurring in maize root systems subjected to a wide range of homogeneous or localized water stresses. This work will allow implementing a mathematical model to predict the dynamic adjustments of root hydraulic architecture in response to specific water stress or irrigation scenarios.

Water transport will be studied at the whole root and single cell level of hydroponically grown seedlings, using biophysical techniques available in the laboratory. The PhD candidate will also interact with an engineer in applied mathematics to optimize the image analysis of root systems and handle numerical simulations. The candidate should hold a Master degree in plant biology. Complementary skills in stress physiology, biophysics of transport, and computing will be appreciated.

Applications including a CV, a letter of motivation and information for two references should be sent to Dr. Christophe Maurel (christophe.maurel@cnrs.fr) and will be continuously evaluated until position is filled. Position is available from October 1st, 2018, but starting date can be negotiated. Gross salary will be 1768 €/month for 3 years.