

## **12 months post-doc position in PIAF laboratory, Clermont-Ferrand, France**

### **Root cap deformation and $[Ca^{2+}]_{cyt}$ dynamics in root tip**

Official start date: as soon as possible (dead-line to apply: May30th 2021)

PIAF is a joint research unit "Integrative Physics and Physiology in Fluctuant Environment »" between INRAe and University Clermont Auvergne, located at Clermont-Ferrand (France).

Our research project relates to the responses of the plants to the abiotic factors.

Website: [https://www6.ara.inra.fr/piaf\\_eng/About/Unit](https://www6.ara.inra.fr/piaf_eng/About/Unit)

#### **Project description**

The candidate will manage experiments in two projects:

- The ERA-CAPS project. The objective is to monitor the eATP-induced  $[Ca^{2+}]_{cyt}$  dynamics at cellular level, in root tip and in response to mechanical stimulus using sensitive GECO  $[Ca^{2+}]_{cyt}$  sensor (Waadt et al., 2017 ; Keinath et al., 2015). An original vertical stage fluorescent microscope will be used to follow  $[Ca^{2+}]_{cyt}$  dynamics. Numerous studies showed that eATP has been implicated in a variety of plant processes, including root hair growth, gravitropism, pathogen responses and thigmotropism (Werasinghe et al., 2009). DORN1 -a lectin receptor-like kinase- has been identified as the primary eATP receptor in Arabidopsis (Choi et al., 2014 ; Cao et al. 2014). In parallel, studies showed extracellular ATP signaling is associated with an elevation of cytoplasmic calcium  $[Ca^{2+}]_{cyt}$  and a DORN1-mediated activation of plasma membrane  $K^+$ - and  $Ca^{2+}$  permeable conductances (Wang et al., 2018). In this project, we are exploring the role that DORN1-mediated eATP signalling plays in mechano-responses.

- The projet is supported by the i-site Clermont CAP2025. The overall objective is to understand the progression of the poplar adventitious root and in Arabidopsis in response to changes in the mechanical constraints exerted by the soil. Assuming that the root cap perceives mechanical stress (Roué et al., 2019), we propose to quantify the cellular deformations of root apex cells under controlled stress using a light sheet microscope (SPIM for Selective Plane Illumination Microscopy) available in the lab.

#### **Qualification**

We are looking for highly motivated plant biologist with good skills in cell biology, and interested in performing multi-disciplinary approaches. Successful candidates will have a PhD degree, or equivalent, in plant biology. Experience in fluorescence microscopic imaging is required and enthusiasm for engineering will be appreciated. Documented experience in root development is an advantage.

Gross monthly salary: around 2500 euro

For further information please contact: Valérie Legué, [valerie.legue@uca.fr](mailto:valerie.legue@uca.fr)

#### **Application**

Please send a CV, a short summary of past research activities and contact information of two referees to [valerie.legue@uca.fr](mailto:valerie.legue@uca.fr)

The complete application must be send before **30th of May 2021**.