l'Ingénierie au service des défis sociétaux

PhD Fellowship in Molecular Plant Science

Laboratory: Tree Microbe Interactions Unit, Team "Stress response and redox regulation (Université de Lorraine)

Thesis supervisors (Université de Lorraine): *Jérémy COUTURIER*

Thesis scholarship: French doctoral contract funded by Lorraine Université excellence (LUE)

Characterization of proteins involved in protein persulfidation in plants

Keywords: redox regulation, biochemistry, molecular biology, plant, stress response

Subject:

Hydrogen sulfide (H_2S) is a gaseous effector involved in a wide variety of physiological processes in most organisms including photosynthetic organisms. The oxidative modification of cysteine residues to persulfides is suggested to represent the main way by which H_2S exerts its biological functions. H_2S signaling via persulfidation of protein cysteine residues represents a novel thiol switching mechanism comparable to nitrosylation, glutathionylation or disulfide bond formation. Proteomic analyses suggest that persulfidated proteins participate in a wide range of biological functions, regulating important processes such as carbon metabolism, plant responses to abiotic and biotic stresses, plant growth and development, protein translation and autophagy. Up to now, the links between the H_2S-producing proteins and the cellular persulfidation state have not been clearly identified. Moreover, reducing systems have an important role to control protein persulfidation, with a possible dual role in regulating H_2S production/signaling and/or protein persulfidation. This project will focus on the study of the molecular mechanisms controlling protein persulfidation in plants. It aims at answering two major questions i.e. the identity of enzymatic pathways responsible for protein persulfidation and the involvement of reducing systems in the regulation of protein persulfidation and trans-persulfidation signaling mechanisms.

Team website: https://mycor.nancy.inra.fr/IAM/?page_id=17

Profile:

For this 3-year grant, we are looking for a highly motivated student interested in the study of redox biology and in particular of redox-dependent modifications of proteins. Since we seek to employ various multidisciplinary approaches relying on molecular biology, protein biochemistry, and plant genetics, the requirement is to have obtained a master degree in biochemistry or plant biology.

Any additional research experience in areas relevant to the research project will be an advantage as well as excellent collaborative skills. This may be practical experience in biochemical, molecular, structural or cellular biology methods... Such additional experience should be demonstrated and included in your application.

Please send the below-listed documents (all in one PDF file) by e-mail to: jeremy.couturier@univ-lorraine.fr

1) For EU candidates: Copy of your national ID card or of your passport page where your photo is printed.
For non-EU candidates: Copy of your passport page where your personal details are presented.
2) Curriculum Vitae including previous experience and technical skills.
3) Letter of motivation relatively to the position (1 page).
4) Copy of your Master degree and/or Engineer degree if already available.
5) Copy of your final marks and ranks.
6) Names and contact details of at least two scientists that have offered to act as references for you must also be included, with a clear indication of their address and relationship to you.

***Deadline for application*: April 30, 2022**
If selected, date for interview: June 2022

Starting date: October 1, 2022

Contact: jeremy.couturier@univ-lorraine.fr