



Post-doctoral position available:

Regulatory role of the membrane nanodomain-organized proteins HIR in the aquaporin-dependent plant immunity

CNRS/INRAE, Montpellier, France

A position is open to work on the function of plasma membrane (PM) nanodomains in plant immunity, in the frame of an ANR project named HIRAQIM. This work will be carried out under the direction of Dr Enric Zelazny in the AQUA team, within the Institute for Plant Sciences of Montpellier (IPSiM), France (<https://www1.montpellier.inra.fr/wp-inra/bpmp/>). The laboratory and the host team have worldwide recognition in the field of membrane protein dynamics and transport physiology in plants (Smokvarska et al. 2023, *Sci Adv* 7;9(14):eadd4791 ; Martinière and Zelazny 2021, *Plant Physiol* 187(4):1839–1855 ; Smokvarska et al. 2020, *Curr Biol* 30(23):4654-4664.e4 ; Martin-Barranco et al. 2020, *Plant Physiol* 184(3):1236-1250 ; Dubeaux et al. 2018, *Mol Cell* 69:953). In the context of the HIRAQIM project, we collaborate with the Infectious Strategies of Xanthomonas (SIX) team at the Laboratory of Plant-Microbe-Environment Interactions (LIPME) in Toulouse, France.

The aim of our project is to study how Hypersensitive Induced Reaction (HIR) proteins, which organize into nanodomains in the PM, participate in plant immunity via the regulation of Plasma membrane Intrinsic Protein (PIP) aquaporins that transport water and H₂O₂. First, combining cutting-edge microscopy, biochemistry and molecular physiology approaches, the candidate will study the regulation mechanisms of PIP aquaporins by HIR proteins in *Arabidopsis* by: (i) analyzing the influence of biotic stimuli on the co-localization between HIR2 and PIP proteins in PM nanodomains, (ii) determining whether HIR proteins can recruit PIPs to nanodomains with a specific lipid and/or protein composition, to ensure their proper functioning. Second, the candidate will analyze the role of HIRs in the defense against pathogens in *Arabidopsis* by characterizing HIR-dependent H₂O₂ signaling using H₂O₂ biosensors. In partnership with our collaborators of LIPME in Toulouse, we will study how the HIR-mediated regulation of PIP aquaporins can influence plant immunity by modulating the transport of water and/or H₂O₂, by comparing two pathogenic bacteria whose pathogenicity depends on these physiological parameters.

The position is open for 3 years, gross salary is from 2810 € per month, adjustable according to experience. Candidates must hold a doctorate and proven research skills evidenced by high quality publications. We are seeking a highly motivated and independent scientist with an experience in: microscopy (confocal, TIRF, possibly sptPALM), plant physiology, protein and/or lipid biochemistry, molecular biology. The candidate should ideally have knowledge in the field of membrane protein regulatory mechanisms.

Applications including a CV, a description of previous research experience and names and addresses of three possible referees should be submitted by the end of January 2024, through the CNRS web portal at:

<https://emploi.cnrs.fr/Offres/CDD/UMR5004-CECABA-051/Default.aspx?lang=EN>