Postdoctoral position in Plant Molecular Physiology
Plant Science Institute of Montpellier (IPSiM)

Project title: role of metals (Fe, Mn, Zn) on pollen development (MICROMET)

A 2-year postdoctoral position funded by the Biopolis project (University of Montpellier) is available, to work on the role of micronutrients in microsporogenesis, in a collaborative project between Stephane Mari (IPSiM, Montpellier) and Ana Assunçao (CIBIO, Porto). The aim of the MicroMet project is to decipher the role of zinc (Zn) iron (Fe) and manganese (Mn) in pollen development, using molecular physiology, genetics and imaging approaches. The post-doc missions are divided in three workpackages that a are described below.
The work plan is divided in several tasks: (i) setting up the imaging of Zn and Mn on whole flowers and anthers (using commercially available and in-house probes), (ii) applying Zn/Fe or Mn deficiencies on plants at flowering to assess the impact on pollen production and viability, (iii) test the pollen-related phenotypes of all the mutant genotypes available from the 2 partners of the consortium and (iv) test the impact of multiple deficiencies (either controlled media or on calcareous soils) on pollen development and viability.

Applications: The applicant should therefore have a strong experience in plant molecular physiology, genetics and in imaging techniques. A background in metal homeostasis would be an important asset.

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Related publications :

Huang TH, Suen DF. 2021. Iron insufficiency in floral buds impairs pollen development by disrupting tapetum function. *Plant Journal* **108**(1): 244-267.

Pandey N, Pathak GC, Sharma CP. 2009. Impairment in reproductive development is a major factor limiting yield of black gram under zinc deficiency. *Biologia Plantarum* **53**(4): 723-727.

Roschzttardtz H, Conejero G, Divol F, Alcon C, Verdeil J-L, Curie C, Mari S. 2013. New insights into Fe localization in plant tissues. *Frontiers in Plant Science* **4**: 11.

Roschzttardtz H, Seguela-Arnaud M, Briat J-F, Vert G, Curie C 2011. The FRD3 Citrate Effluxer Promotes Iron Nutrition between Symplastically Disconnected Tissues throughout Arabidopsis Development. *The Plant Cell*. 2725-2737.

Sharma CP, Sharma PN, Chatterjee C, Agarwala SC. 1991. MANGANESE DEFICIENCY IN MAIZE AFFECTS POLLEN VIABILITY. *Plant and Soil* **138**(1): 139-142.

Yan JP, Chia JC, Sheng HJ, Jung HI, Zavodna TO, Zhang L, Huang R, Jiao C, Craft EJ, Fei ZJ, et al. 2017. Arabidopsis Pollen Fertility Requires the Transcription Factors CITF1 and SPL7 That Regulate Copper Delivery to Anthers and Jasmonic Acid Synthesis. *Plant Cell* **29**(12): 3012-3029.

Zhang B, Zhang C, Liu CG, Fu AG, Luan S. 2021. A Golgi-localized manganese transporter functions in pollen tube tip growth to control male fertility in Arabidopsis. *Plant Communications* **2**(3).