

## PhD Fellowship in Developmental Biology

### Maternal factors regulating Nodal expression in the sea urchin embryo: a mechanistic and evolutionary approach

A **three-year PhD position** supported by the French Foundation for Medical Research (FRM) is available starting September 1st 2018 to work in the group Gene regulatory networks, axis specification and morphogenesis of the sea urchin embryo at the Institute of Biology Valrose. The area of research will concern the analysis of Dorsal-ventral patterning in the sea urchin embryo through the analysis of the function and evolutionary conservation of several maternal factors that play critical roles in the regulation of nodal expression and/or Nodal activity. (see Lapraz F, Haillot E, and Lepage,T – 2015 - A deuterostome origin of the Spemann organiser suggested by Nodal and ADMPs functions in Echinoderms; [Nature communications](#) and Haillot E, Molina MD, Lapraz F, and Lepage,T (2015) The Maternal Maverick/GDF15-like TGF- $\beta$  Ligand Panda Directs Dorsal-Ventral Axis Formation by Restricting Nodal Expression in the Sea Urchin Embryo. - 2015 - [PLoS Biology](#)).

Our laboratory has recently identified several maternal factors that play crucial roles in the regulation of nodal expression including a maternal TGF beta called Panda, a BMP type I receptor called Alk1/2, a maternal transcription factor of the Ets family called Yan as well as a novel secreted protein of unknown function. Although these factors are each crucially required to spatially restrict nodal expression, their mechanism of action is not understood. Furthermore, it is not known if these genes are required to restrict nodal expression only in the Mediterranean sea urchin *Paracentrotus lividus* or if their function is conserved in other species.

The project will specifically address these questions by elucidating how these factors work and determining if their function is conserved in different species.

Candidates should have obtained recently a Master degree. Both national and international candidates are encouraged to apply. Interested candidates should send a Curriculum Vitae, a summary of research interests and goals and contact information for two or three referees to:

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[Research team webpage](#)

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