MASTER 2 RESEARCH INTERNSHIP

A mechanical atlas of early embryos : *from measurements to models*

Laboratories:

Developmental Biology Laboratory of Villefranche-sur-Mer (LBDV)
Sorbonne Université - Institut de la Mer UMR7009
181 chemin du Lazaret, 06230 Villefranche-sur-Mer

Center for Interdisciplinary Research in Biology (CIRB)
Collège de France - CNRS UMR 7241
11, place Marcelin Berthelot, 75005 Paris

Supervision:

Dr. Alex McDougall - Ascidian BioCell Group
ascidian-biocell-group.html
alex.mc-dougall@imev-mer.fr
Phone: +33.4.93.76.37.77

Dr. Hervé Turlier - Multiscale Physics of Morphogenesis
www.turlierlab.com
herve.turlier@college-de-france.fr
Phone: +33.1.44.27.14.10

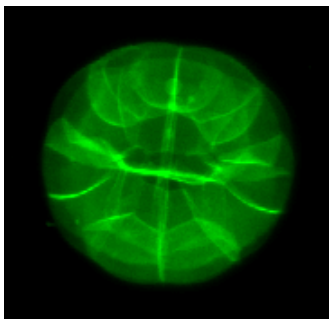
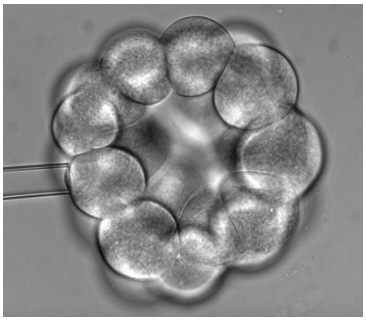
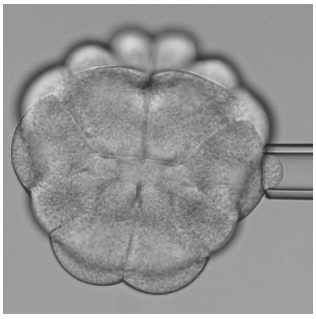
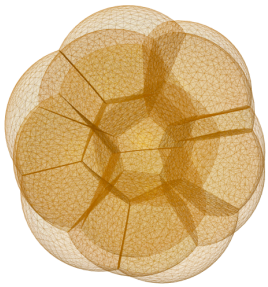
Paid internship: YES

Possibility of PhD thesis after internship: YES

Expected profile: The candidate should be trained in **biophysics,** or **soft-condensed matter physics**, and should be willing to work at the interface of **experimental** and **computational** biology. She/he should have good computational skills (**Python**) and interest for deep learning techniques.

Project: The project aims at creating a spatio-temporal map of cellular forces in the early embryos of two marine species: ascidian (*Phallusia mammillata*) and jellyfish (*Clytia hemisphaerica*).

The student will use the micropipette aspiration technique to measure the cortical tension and viscoelastic properties of cells during the first stages of embryo development. She/He will be trained and perform experiments in the team of A. McDougall in Villefranche-sur-Mer. She/He will perform extensive confocal light-imaging of early embryo development and will use computational tools developed in the team of H. Turlier for automatized analysis of cells forces. Depending on her/his interests, she/he will also have the opportunity to develop her/his own image analysis tools to automatize analysis of micropipette aspiration videos, based on deep learning methods. The internship can lead to a PhD thesis in co-supervision between the teams of A. McDougall and H. Turlier.

Working environment:

The student will be working mainly in the team of A. McDougall in Villefranche-sur-Mer and will be co-supervised by H. Turlier, with whom several in-person meetings will be organized either in Paris or Villefranche. Experimental work will be assisted by experienced researchers, experts of micropipette aspiration and early embryology. A notebook computer will be provided to the student, that will also have access to powerful computing resources located in H. Turlier's team.