

POSTDOCTORAL position

Microfluidic flow of vesicle prototissues as a model for embryonic tissues

Laboratoire Charles Coulomb, University of Montpellier (south of France)

The Soft Matter team of the Laboratoire Charles Coulomb (Montpellier) offers a post-doctoral research contract, funded by the Labex-Numev, for a **period of one year** (with possibility of renewal) **starting on September 1st, 2021**. The postdoc will be supervised by Laura Casanellas ([web page](#)).

Project description

The goal of the project is to characterize the microfluidic flow of biomimetic tissues as a model system for *Xenopus* embryos. Specifically, we aim at unveiling the role of cell-cell adhesion on the flow of the tissue. In our team we have recently synthesized a prototissue based on the self-assembly of giant unilamellar vesicles (GUV), which displays tuneable GUV adhesion, size and morphology. This model prototissue represents an ideal tool to uncouple adhesion from other physical and biological cell properties (which is extremely challenging in living systems) and to probe its role on the tissue rheology.

Postdoc objectives

The successful candidate will focus on the implementation of microfluidic flow experiments of vesicle prototissues, using different flow geometries. The candidate will first develop the necessary imaging tools necessary to provide a quantitative description of the flow at the tissue and cell levels. Next, the impact of individual GUV properties (adhesion and elasticity) on tissue rheology will be probed in microfluidic confinement. The results will enable to validate the theoretical constitutive equation describing the flow behavior of the biomimetic tissue.

Scientific collaborations

Two collaborations are foreseen in the context of this project:

- 1) Collaboration with F. Fagotto (CRBM, Montpellier) will enable to compare our results with analogous experiments performed using tissue explants from *Xenopus* embryos.
- 2) Collaboration with F. Sagués and J. Ignés (University of Barcelona, Spain) will make possible the development of active biomimetic tissues.

Postdoc Candidate

We are looking for a highly motivated candidate to join our team, willing to carry on experimental research in a multi-disciplinary framework. Candidates should hold a PhD in Biophysics, Physics, Fluid Mechanics or Chemistry. Expertise on microfluidics, microscopy, and image analysis will be highly appreciated. Good communication skills and a basic knowledge on programming are required.

Application: Applicants should send as soon as possible their CV, together with a cover letter and one/two references to L. Casanellas (laura.casanellas-vilageliu@umontpellier.fr)

Please, feel free to contact me for any further information.

