

Master 2 + PhD Project: Mechanical control of epithelial cell death and extrusion

Supervisor:

Name: Dr. LADOUX BENOIT
Phone: +33 (0)1 57 27 80 71
E-mail: benoit.ladoux@ijm.fr

Host Laboratory:

Affiliation: CNRS and Paris Diderot
Lab Name : Institut Jacques Monod
Address : "Cell Adhesion and Mechanics", Institut Jacques Monod, Université Paris Diderot & CNRS, Batiment Buffon, 15 rue Hélène Brion, 75205 Paris cedex 13
<http://www.ijm.fr/en/research/research-groups/cell-adhesion-and-mechanics/>

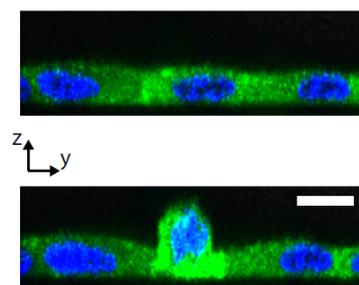
Partners or collaborations :

Name: René-Marc Mège (Cell biologist)
Affiliation: Same team (Institut Jacques Monod, Paris)
Other collaborations: Julia YEOMANS (Oxford University, UK); Philippe Marcq (Institut Curie, Paris).

Project description :

Epithelial cell sheets act as a covering for most of the internal and external surfaces of the body. While the epithelial barrier function needs to be maintained, epithelial cells are constantly challenged by their environment, which can lead to cell elimination. Understanding how cell fate -live, death, or transformed- is determined within epithelia and how this leads to the competition and/or extrusion of cells from the epithelium is key to understanding important homeostatic and pathologic processes such as aging and cancer development. Recent studies including ours have shed light on the crucial coupling of cell shape, collective cell behaviors and mechanical stress to biochemical signaling for cell extrusion and delamination, but a great deal remains to be elucidated. The role of the mechanical environment on the fate of extruded cells is largely unexplored. **Here, we thus propose to address the**

impact of mechanical forces on epithelial cell extrusion and delamination *in vitro* environments.



We will study how extrusion is influenced by external force application on epithelia, and how cells respond to different rates and types of force application (shear, compression, or stretch). Our project involves a multidisciplinary approach combining microfabrication, experimental cell biology, functional live cell imaging, tissue dynamics, computational image processing and biophysical approaches.

References:

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