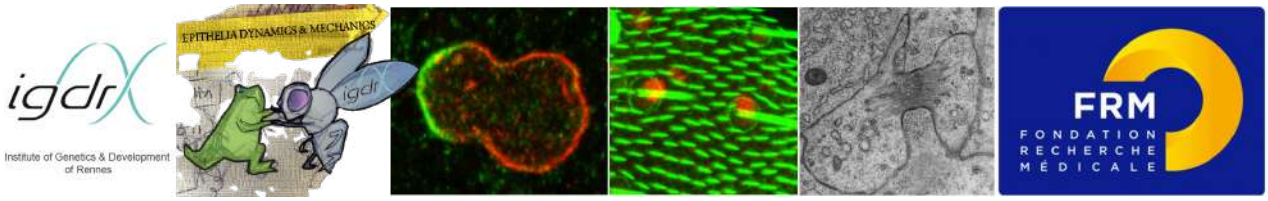

Cadherin - Integrin adhesive switch

PhD and Post Doc positions available

As part of the FRM team labelling program, funding for a PhD (3 years) and a Postdoc (2 years) position is available in the Lab of **Roland Le Borgne** at the Institute of Genetics and Development of Rennes (France) to study **mechanical homeostasis in epithelia using *Drosophila*** *(https://igdr.univ-rennes.fr/en/roland-le-borgne-group)*.

Epithelia are composed of polarized cells that establish the permeability and mechanical barriers of the organism and form organs. Throughout life, the integrity of epithelia is constantly challenged by cell division, cell intercalation, delamination of pretumoral cells or extrusion of dying cells. Remarkably, all these events occur without tissue tearing apart! How is that possible? If you are interested in understanding how robustness and plasticity are achieved in epithelia, and in decrypting the underlying molecular mechanisms involved, join us! Adherens junctions (AJ) are formed by Cadherins and mechanically couple epithelial cells, transmitting actomyosin-generated forces and promoting cell shape changes that in turn drive tissue morphogenesis. AJ are highly dynamic and become locally dis/assembled in response to mechanical stimuli to preserve tissue integrity. Force regulation is also required between epithelial cells and the extracellular matrix, where focal adhesions (FA) assemble and Integrins interact with actin linkers to ensure mechanochemical tissue cohesion. In a completely surprising and unexpected manner, we uncovered that at the site of AJ disassembly, Integrin-based contacts assemble, opening a whole new avenue for research in epithelia homeostasis. Our working hypothesis is that the Cadherin to Integrin adhesive switch preserves mechanical tissue integrity and to explore this we are using a myriad of multidisciplinary approaches, from genetic engineering to super-resolution microscopy, photomanipulation (photoablation, optogenetics), electron microscopy (EM) and correlative light to EM (CLEM).

Our team is part of the **Institute of Genetics and Development of Rennes** (https://igdr.univ-rennes.fr/en), a dynamic and expanding Institute with sixteen teams of well-established and young PIs and over 200 researchers and staff members of diverse nationalities (U.K., Poland, Denmark, Spain, Australia, India, Chile, Argentina). The IGDR fosters multidisciplinary approaches in fundamental and translational research and benefits from state-of-the-art facilities in light and electron microscopy. Research topics range from stem cell division and fate acquisition to human brain diseases and oncogenesis, carried out *ex vivo* using organoids and *in vivo* using model organisms such as *C. elegans*, *Drosophila* and *Xenopus*. Rennes is the capital of Brittany, a famous location known for its stunning landscapes, music and maritime festivals, paradisiacal beaches and great gastronomy. Rennes is a dynamic, student-friendly city with a rich cultural portfolio of activities and direct access to Paris (90 min) and International Roissy-Charles de Gaulle Airport (<2hours).

We provide support for postdocs who wish to join one of the two national research organisations, **Inserm** and **CNRS**, with the help of the Grand Ouest region, and we have successfully mentored several postdocs who have gained permanent positions and fundings, as career development is strongly encouraged in the team.

Applicants should have a strong background in cell or developmental biology. Experience in quantitative image analysis and previous experience with *Drosophila* would be an asset.

If you have an open mind, a sharp sense of observation and want to deepen your background in Cell and Developmental Biology with transdisciplinary approaches, please contact roland.leborgne@univ-rennes1.fr providing CV, a short letter of motivation and the email addresses of three references.

The project builds on the following achievements of the team

- M. Mira-Osuna, S. Plunder, E. Theveneau, and R. Le Borgne (2025) BioRXiv (under review)
- T. Esmangart de Bournonville, M. Jaglarz and R. Le Borgne (2024) **eLife** 2024 Feb 2; 13:e91246
- E. Houssin, M.Pinot, K. Bellec, R. Le Borgne (2021) **elife** Oct 1;10:e66659.
- T. Esmangart de Bournonville, R. Le Borgne (2020) **Curr Biol.** 2020 Nov 2;30(21):4245-4253.e4.
- E. Daniel, I. Kolotueva, M. Daudé, V. Auld R. Le Borgne (2018) **Curr Biol.** 2018 May 7;28(9):1380-1391.e4.
- N. Loyer, I. Kolotuev, M. Pinot, R. Le Borgne (2015). **PNAS**. 2015 Oct 13;112(41):12717-22.
- N. Founounou, N., Loyer, N. and Le Borgne, R. (2013). **Developmental Cell** 24 (3), pp242-255.