



Phd Offer : Role Of The Cytoskeleton In The Chirality Of Biological Systems

A 3-year PhD position starting November 2020 is available in the group of Dr Laurent Blanchoin and Manuel Théry at the 'Institut de Recherche Interdisciplinaire de Grenoble' (IRIG), France, Cell & Plant Physiology Laboratory, (<http://cytomorpholab.com/>).

Our lab investigates the physical rules underlying cytoskeleton self-organization processes. Among these processes, the emergence of chirality in cytoskeletal systems has recently been shown to control the asymmetric positioning and architecture of vital organs such as the heart, gut and brain. However, how symmetry is broken and what are the cytoskeleton components involved in the initiation and propagation of this process remain open questions.

The PhD project will thus aim at understanding how chirality emerges from symmetrical conditions in biological systems of increasing size and complexity (filaments, cells and tissues).

The PhD candidate will take advantage of the 2D and 3D microfabrication expertise developed in the lab to constrain endothelial cells and study the effect of geometrical confinement, adhesion strength and substrate stiffness in the emergence of chirality at the single cell level. Using the same approach coupled to chemical inhibition or knock down of cytoskeleton components and associated signalling pathways, the candidate will identify the key players involved in the emergence of this chirality. Finally, he/she will investigate the mechanisms propagating the chirality of intracellular architectures to cell groups and tissues.

The student will have a unique opportunity to be part of an internationally renowned team, working in a creative and lively environment, providing access to state of the art techniques (microfabrication techniques, advanced microscopy, biophysics). The project will also benefit from a collaboration with the group of Stephane Noselli that has pioneered the study of left-right asymmetry using *Drosophila* as a model system, through identification of key molecular processes and players (<http://ibv.unice.fr/research-team/noselli/>).

We are looking for young scientists with a strong interest in academic research and interdisciplinary projects. Highly motivated candidates are encouraged to apply by sending their CV and motivation letter to Laurent Blanchoin (laurent.blanchoin@cea.fr) or Manuel Théry (Manuel.thery@cea.fr) before the end of April 2020.

Selected publications from the team :

Reymann, Nat. Mat., 2010

Tseng, PNAS, 2012

Farina, Nat. Cell. Biol., 2016

Vignaud T., J. Cell Science, 2012

Boujemaa-Patersky, Nat. Comm., 2017

Reymann, Science, 2012

Burute, Dev. Cell, 2017

Martiel JL., Method Cell. Biol., 2015

Manhart, Icheva, Elife, 2019

Ennomani, Curr Biol., 2016

Senger, J. Cell Sci., 2019

Sun Z., Nat. Cell Biol., 2016

