EU Marie SKLODOWSKA-Curie Initial Training Network
BIOPOL

A European Research Training Network at the Interface of Cell/Molecular Biology and Membrane Physics

Topic: Biochemical and mechanochemical mechanisms in polarized cells

Call: HORIZON 2020-MSCA-ITN-2014
Proposal Number: 641639

Project title: **Fluid flow as regulator for planar polarity of cilia in epithelial cells**

*Type of position:* Early Stage Researcher (ESR)/ PhD position

**Short description:**
There is a very interesting developmental question open, as to how muco-ciliary tissues (crucial to vertebrate life) manage to orient the plane of beating of motile cilia. This orientation happens after the cells themselves have become polarised (and at that stage they are not ciliated). We have a hypothesis based on theoretical work suggesting that self-generated flow is a viable mechanism. Cilia could fix their orientation by interacting mechanically with each other (through the fluid flow), and then this gets locked in place by the cilia basal bodies getting fixed in a network of microtubules. This project would at least initially not take the conventional (and complex) route of looking at embryo development, but instead use a cell line to which we have access that can be de-differentiated, and then differentiated again into ciliated cells, and study in this model system the process by which the polarity of cilia beat is fixed.

**TECHNIQUES:** Automated fast optical imaging; microfluidic structures; optical tweezers; pipette micromanipulation.

**Literature:**
Nicolas Bruot and Pietro Cicuta; Emergence of polar order and cooperativity in hydrodynamically coupled model cilia J. R. Soc.: Interface 10, 20130571 (2013).

Job Requirements: Experimental background in cell biology, biochemistry, molecular genetics or biophysics.

**Host Institute:**
Cavendish Laboratory
University of Cambridge
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Cambridge CB3 0HE, UK

Supervisor: Dr. Pietro Cicuta
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Eligibility: There are strict eligibility requirements for the ESR PhD positions in MSCA-ITN. Please ensure that you qualify before applying, as ineligible candidates cannot be considered.

- Applicants must not have resided or performed their main activity (work, studies, etc.) in the UK for more than 12 months in the 3 year period immediately prior to the start date of the PhD research.
- Applicants must not have already a PhD

For more information on MSCA-ITN, visit http://ec.europa.eu/research/mariecurieactions/index_en.htm

Starting date: 01.07.2015 (or later)

Duration: 36 months

Salary: According to the Marie Curie-ITN rules

How to apply:
please send the following documents via e-mail directly to Dr. Pietro Cicuta

- A complete CV
- Copies of University Master certificates or equivalents
- Contact details of two referees, who can provide a letter of recommendation

For further information: http://www.sheffield.ac.uk/itn-biopol