



Post-doc position (1 year)

Measure microtubule dynamics *in vivo* through an image processing approach; application to mitotic spindle positioning

A post-doc position is available immediately in the research group “A reverse engineering of cell division” (pecreaux.openwetware.org), supervised by Jacques Pécéréaux at the Institute of Genetics and Developmental biology in Rennes (IGDR, director: Claude Prigent), Brittany, France. The Pécéréaux’s group focuses on uncovering mechanisms of asymmetric cell division through a multidisciplinary approach featuring molecular biology, biophysics modeling, systems biology and image processing. **The chosen candidate will measure microtubule residency time at the cortex, growth and shrinking rate via automated detection of entire microtubule in live images.**

Scientific environment:

The Institute of Genetics and Developmental biology of Rennes (IGDR) is a vibrant research institute featuring established teams and dynamics new labs. Research covers genetics, regulation of expression, cell division, membrane traffic and polarity. In the past years, three new labs added microscopy technological development and image processing to the institute skills’ portfolio (<http://umr6061.univ-rennes1.fr/english/>).

Background:

How biological systems can perform tasks with such an extraordinary fidelity and robustness despite their complexity and variability? Few studies address this question in mechanical biological systems such as cell division (mitosis), during which not only chromosomes but also cell contents are dispatched in a strongly controlled way. A central player is microtubule, which is a stiff linear structure dynamically polymerizing and depolymerizing. This dynamic is highly regulated and react to forces exerted. It is thus key to finely quantify it to establish biophysical model of cell division events.

Goals of the project:

In vivo images of fluorescently labelled microtubules will be obtained by spinning disk confocal microscopy (with an ultra-sensitive EMCCD camera). Microtubules will be detected by an evolution of [Berlemont et al. 2010] algorithm in collaboration with J.-C. Olivo-Marin. This measure will be combined with tracking of microtubule associated proteins, tagged in a different color, which track the growing end e.g. Eventually, a user friendly plugin/software (Matlab / imageJ / ICY) will be produced, documented, and transferred to the facility. Biological significance will be investigated in collaboration with other members of the team.

Requirements and position details:

PhD in experimental physics, applied mathematics or computer science with strong education or experience in object oriented and functional programming (Matlab, Java, ...), image processing, analytical and differential geometry and numerical optimization; experience with microscopy imaging or biophysics will be appreciated • Strong interest in (molecular cell) biology; a previous experience in biology an advantage • Highly motivated, with excellent interpersonal and communication skills to collaborate in an interdisciplinary team • fluent in spoken and written English (French is not mandatory) • Grant eligibility criterion: to have lived in France for less than 6 months since february 2011 • Gross salary will range between 27,400 and 34,400 €/year according experience and qualifications. The position gives right to social benefit and includes health insurance. CNRS is an equal opportunity employer. Position is available immediately.

To apply (or for informal enquiries), please send (preferably by email and as pdf) to:

Dr Jacques Pécéréaux, jacques.pecreaux@univ-rennes1.fr. IGDR, CNRS UMR 6061 - Faculté de Médecine (Université Rennes 1), 2 avenue du Pr L. Bernard, CS 34317, 35043 Rennes cedex, France

A **Curriculum Vitae** (CV) detailing your **publications**, conference contributions and your **achievements**. • A **cover letter** detailing your **motivation** and **skills** to take over the project. • and the names of **two referees**. This call will remain opened until a suitable candidate is found. Applications will be assessed in the order in which they are received.