# Postdoctoral/Engineer positions on Bioelectricity & Topographic-sensing

**Laboratoire Matière & Systèmes Complexes (MSC) and Institut Jacques Monod (IJM), Université de Paris – CNRS, Paris 75013, France**

Within the frame of the BioMechanOE transverse project of the Labex "Who Am I?" network of excellence, the team of Dr. Nicolas Chevalier (http://nicochevalier.net) at Laboratoire Matière & Systèmes Complexes (MSC) and the team of Dr. Wang Xi at Institut Jacques Monod (IJM) are hiring **two postdoctoral candidates and/or engineers** to investigate the effects of **bioelectrical and 3D topographic signals on cell and organ differentiation, migration, proliferation and metabolism**.

We are just starting to unravel how electrical signals stemming from the cell membrane potential orchestrate development (1), regeneration (2) at the single- and multicellular level, in homeostasis or disease (3). Topography–induced collective migration (e.g. substrate curvature) links closely to bioelectrical properties (4,5) and cancer invasion in 3D matrices (6-12). In this project, we will explore how bioelectrical properties, electrical stimuli and 3D topographic signals influence cell metabolism and ultimately determine cell fate. The recruited candidates will have the chance to become pioneers in this exciting field of research, in two of the foremost research institute and university in France.

For consideration, applicants need to submit a cover letter, curriculum vitae with full publication list and statement of research interests (1-2 pages maximum) in PDF format to: nicolas.chevalier@u-paris.fr and wang.xi@ijm.fr .

**Work duties**

The candidates will develop innovative, high-throughput cell and organ electric stimulation setups to investigate how membrane potential, static and time-variable electric fields impact biological fate or 3D scaffolds consisting of defined out-of-plane curvatures. Biological systems of interest include embryonic or adult intestine, isolated intestinal mesenchymal cells, epithelial cells, tumour cells from human colonic carcinoma and from stromal gastro-intestinal tumors. The systems will be characterized in terms of membrane potential (voltage-sensitive dyes, calcium imaging, electrophysiology), differentiation (immunohistochemistry, RNAseq, proteomics), migration (live 2D or 3D confocal imaging), proliferation, metabolism (Seahorse methodology). A microfabrication facility will also allow to examine how 2D or 3D topographic or mechanical cues interact with bioelectrical or metabolic properties.

The candidates will:

- Plan, direct and conduct advanced research experiments, evaluate and analyze data
- Summarize research findings and publish results in international scientific journals
- Supervise interns and be responsible for laboratory operations
- Write or assist in writing research projects

The candidates will benefit from the scientifically rich environment of the Labex, comprising specialists in biophysics, embryology, cell biology and metabolism.

## Minimum qualifications

Ph.D. in biophysics, biomedical engineering, physiology, neurosciences, biological and health sciences, electrical engineering or related fields.

## Preferred Qualifications

- Experience in cell biology, developmental biology, metabolism
- Experience in electrophysiology, electrochemistry and electrical aspects of cell function
- Experience in microfabrication and bioengineering

## Salary and duration of the contracts

2400 - 2900 € net / month depending on experience. Funding for a minimum of one year with possible extension.

## References


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