

Postdoctoral position in biophysics

We are seeking a highly motivated postdoctoral researcher with background in **biophysics** to join our team to explore the physics behind **leukocyte adhesion** for the European Research Council (ERC) Consolidator grant project “**MechaDynA - Multi-scale mechanics of dynamic leukocyte adhesion**” starting in September 2018.

Project

In the so-called leukocyte adhesion cascade, leukocytes flowing at high velocities (up to mm/s) impact the vessel wall, roll at $\mu\text{m/s}$ by extending long membrane tethers, and finally migrate at nm/s to the site of inflammation. They are thus subjected to mechanical forces at different timescales, from sub-msec to several minutes. The project proposes to develop and apply high-speed atomic force microscopy (HS-AFM^{1,2}) and acoustic force spectroscopy (AFS³) coupled to optical microscopy to allow force measurements on living leukocytes. The goal is to obtain a complete, multi-scale picture of the physics behind the leukocyte adhesion cascade over the widest dynamic range. In particular, the candidate will focus on the physics and molecular mechanisms behind membrane tether formation⁴.

Candidate

The candidate with background in biophysics will integrate an interdisciplinary and international team and will work in close collaboration with a computer scientist to develop instrumentation control. The candidate should have experience in force measurements using AFM or other nanotool and optical microscopy. Experience in cell biology is also important. Good programming skills (Matlab, Labview or Python) are essential.

Hosting group and working environment

The [force microscopy group](#) is an interdisciplinary and international group within the [LAI U1067 Aix-Marseille Université / INSERM / CNRS](#). The lab is located in the Luminy campus within the Calanques National Park in Marseille, France. The campus provides an exceptional research environment, including renowned centers in immunology, developmental biology, theoretical physics and mathematics. The lab is part of the Turing Centre for Living Systems ([CENTURI](#)), an interdisciplinary institute aiming at developing an integrated interdisciplinary community, to decipher the complexity of biological systems.

Application procedure

Applications must be submitted to Felix Rico (felix.rico@inserm.fr) before September 1, 2018, and must include:

- CV with a list of publications and the names and contact details of 2 referees
- A short letter describing the motivation to join our group and your contribution to the research project

Selected applicants will be notified whether their application has been selected for further assessment and interview either by personal visit or video conference.

Terms of salary and employment:

We propose a 1-year contract renewable up to the length of the ERC project. The terms of employment are set according to the prefixed table of wages and depend on professional experience. The successful candidate will receive a gross salary of around 2800€ per month.

References

1. Ando, T. *et al.* A high-speed atomic force microscope for studying biological macromolecules. *Proceedings of the National Academy of Sciences* **98**, 12468–12472 (2001).
2. Rico, F., Gonzalez, L., Casuso, I., Puig-Vidal, M. & Scheuring, S. High-Speed Force Spectroscopy Unfolds Titin at the Velocity of Molecular Dynamics Simulations. *Science* **342**, 741–743 (2013).
3. Sitters, G. *et al.* Acoustic force spectroscopy. *Nat Meth* **12**, 47–50 (2015).
4. Brochard-Wyart, F., Borghi, N., Cuvelier, D. & Nassoy, P. Hydrodynamic narrowing of tubes extruded from cells. *Proc Natl Acad Sci U S A* **103**, 7660–3 (2006).



This project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No 772257).