

Postdoc in the field of long-range electrodynamic interactions between proteins

Working place:

Institute of Neuroscience and Medicine and Institute for Advanced Simulations - Computational Biomedicine (INM-9/IAS-5) at Forschungszentrum Jülich.

The Computational Biomedicine Department (INM-9/IAS-5) at Forschungszentrum Jülich develops and uses computational methods going from multi-scale molecular simulations to bioinformatics and drug design to face the challenge of understanding the molecular basis of cellular (especially neuronal) signaling processes, in healthy and disease conditions. Because of the complexity of the systems under study, simulation approaches require massive parallel computing resources such as those available at the Jülich Supercomputing Center (JSC) at Forschungszentrum Jülich.

Scientific framework:

The offered position is part of an ambitious and challenging European project aiming at deciphering the role of long-range electrodynamic interactions (LEDIs) on protein-protein recognition processes as well as developing a breakthrough lab-on-chip THz biosensor technology to investigate LEDIs between proteins, from in vitro to in vivo. The project is funded in the framework of the Horizon 2020 FET Open program. The research will be conducted in close collaboration with Professor Marco Pettini (Centre de Physique Théorique, Marseille, CNRS, France). The project consortium also includes experimentalists in the field of THz spectroscopy, time-resolved X-ray and fluorescence correlation spectroscopy.

Your Job:

In living matter, a complex network of molecular events involving hundreds of different molecules, which have to diffuse, meet and interact at the correct time in the correct place, is responsible for the transmission of information through cells. All these biochemical reactions are highly spatially organized and coordinated. This project aims at extending the paradigm of the self-organization of the intracellular living matter, by exploring the existence of long-range electrodynamic interactions (LEDIs) between proteins. Energy condensation phenomena in the THz frequency band, upon suitable energy injection rate, have been hypnotized as possible mechanism for LEDIs activation. Your tasks in this context are:

- Using out-of-equilibrium MD simulations to study the possible activation mechanisms of LEDIs in protein systems
- Writing scientific publications and reports
- Presenting the results in international conferences and meetings with the collaborators

Your Profile:

- Excellent university degree (Master) in physics, biophysics or biochemistry
- PhD degree in one of the above disciplines
- Strong background in statistical physics and MD simulations of biological system
- Ideal previous experience with normal mode analysis
- Records proving the accomplishment of a successful independent work
- Excellent knowledge of written and oral English
- Interactive person with good communication skills

Our Offer:

We support you in your work with:

- A large research campus with green spaces, offering the best possible means for networking with colleagues and pursuing sports alongside work
- A friendly work atmosphere and intensive exchange with colleagues
- Comprehensive training courses and individual opportunities for personal and professional further development
- Extensive company health management
- Ideal conditions for balancing work and private life, as well as a family-friendly corporate policy
- Full-time position with the option of slightly reduced working hours and 30 days of annual leave
- Targeted services for international employees, e.g. through our International Advisory Service.

We offer you an exciting role in an international and interdisciplinary working environment. The position is initially for a fixed term of 2 years, with possible extensions. Salary and social benefits in conformity with the provisions of the Collective Agreement for the Civil Service (TVöD). Depending on the applicant's qualifications and the precise nature of the tasks, salary grade 13 TVöD-Bund.

Forschungszentrum Jülich promotes equal opportunities and diversity in its employment relations. We also welcome applications from disabled persons.

Contacts:

Prospective candidates are invited to send their CV, motivation letter, academic diploma and transcript by April 30 2022 to:

Vania Calandrini (Forschungszentrum Jülich): v.calandrini@fz-juelich.de

Marco Pettini (Centre de Physique Théorique): marco.pettini@gmail.com

Late applications may be considered if the position is not filled.