



## Opening for a PhD student position:

# Protein diffusion at membranes and neuronal signal transmission – simulation and theory

**START:** May 2017 or later

**DURATION:** Three years

**SALARY:** E13/2 TVÖD with additional allowance possible, depending on candidate's profile

The Soft Matter group at the Institute of Complex Systems (ICS-3), Research Centre Jülich, is offering a position for a motivated PhD student. The PhD work will be integrated into the soft matter and biophysics activities of ICS-3. The Research Centre in Jülich provides a highly interdisciplinary environment and excellent infrastructure, including Europe's most powerful supercomputing center. The accepted candidate will have the opportunity for complementary training within the International Helmholtz Research School "BioSoft" (IHRS BioSoft, [www.ihrs-biosoft.de](http://www.ihrs-biosoft.de)).

### Description of research work

The understanding of the lateral diffusional motion of charged nano-sized particles (proteins) along a membrane such as a lipid bilayer, and inside a viscoelastic medium such as the cell plasma, is highly relevant to cell biology and neuroscience (postsynaptic signal processing). The PhD project deals with the exploration of protein diffusion and viscoelastic processes in these systems, using many-particle Brownian Dynamics simulation and mean-field theory methods applied to coarse-grained simplifying models. Important aspects of the project are confinement and crowding effects, protein-membrane interaction and the influence of the solvent-mediated hydrodynamic interactions. The PhD work will be done in the framework of an interdisciplinary project on neuronal memory cascades jointly with the computational medicine group at the Institute of Neuroscience and Medicine (INM-9), and in collaboration with an experimental group at the ETH Zürich.

### Requirement

A master degree in Physics is required. We are seeking for a candidate familiar with Brownian Dynamics and / or Molecular Dynamics simulation methods applied to soft matter or biophysical systems, and with a strong interest in simulation and theoretical work in Statistical Physics. Good programming and scripting skills are requested. To apply, please send a motivation cover letter, a full CV (including a list of publications, if applicable), and copies of certificates stating all courses and grades to the email address given below. If possible, arrange for two letters of recommendation.

### Contact

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