MAX-PLANCK-INSTITUT FÜR BIOPYSIKALISCHE CHEMIE
KARL-FRIEDRICH-BONHOEFFER-INSTITUT
GÖTTINGEN

The Max Planck Institute for Biophysical Chemistry is one of the largest institutes of the Max Planck Society for the Advancement of Science e. V. and conducts basic research to advance knowledge and benefit society. Innovative projects and interdisciplinary cooperation characterize research within the Max Planck Society.

The Department of *Theoretical and Computational Biophysics* (Prof. Dr. Helmut Grubmüller) invites applications for a position as

PhD Student or Postdoc (f/m/d)
(Code Number 08-19)

for the project

- Mechanism of Ribosomal Antibiotics-Induced Stalling Studied by Molecular Dynamics Simulations and Non-Equilibrium Statistical Physics -

The ribosome synthesizes proteins by catalyzing peptide bonds between amino acids and is the target for many antibiotics. The growing peptide chain leaves the ribosome through a 10-nm exit tunnel. Certain antibiotics, the macrolides, bind inside this tunnel. Depending on the sequence of the peptide, the presence of these antibiotics can have different consequences: (1) peptides are not able to pass by the antibiotic, thereby stalling the ribosome, (2) peptides extend further than the antibiotic binding site but are stalled at a later stage, and (3) peptides can pass the antibiotic and become fully synthesized. This sequence-specific stalling is used by bacteria as a sensor for the presence of the antibiotics and to regulate resistance mechanisms, but also has pharmacological implications. The aim of the project is to use extensive MD simulations of different peptides and antibiotics in the ribosomal tunnel to understand how the interplay between the peptides, the antibiotics and the ribosome leads to the sequence-specific stalling, and to rationalize the results in terms of a simplified statistical mechanics model. (https://www.nature.com/articles/ncomms12026)

The successful candidate for either position has a keen interest in computational molecular biophysics and in interdisciplinary collaborative research, as well as a strong background in theoretical physics or physical chemistry, structural biology, and scientific computing.

PhD candidates hold (or expect to complete soon) a Master's or equivalent degree; Postdocs hold a PhD or equivalent degree in any of these or a related field.

PhD students will have the opportunity to participate in one of several available PhD programs, with three years funding and a possibility of extension, in collaboration with the University of Göttingen. Masters students aiming at a fast track PhD are also welcome. The Postdoc position is limited to two years with a possibility of extension.

Payment and benefits are based on the TVöD guidelines. The starting date is flexible.

The group language is English, so no German language skills are required – but it's a great opportunity for you to learn German!

The Max Planck Society is committed to increasing the number of individuals with disabilities in its workforce and therefore encourages applications from such qualified individuals.

Interested? Submit your application including cover letter (explaining background and motivation), CV, transcripts, and publication record preferably via e-mail as one single PDF file to

ausschreibung08-19@mpibpc.mpg.de

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