PhD Position in Computational Membrane Biophysics (65-75% E13)

Department Biologie, Erlangen, TV-L E 13, Vollzeit, Befristete Anstellung, Bewerbungsschluss: 30.09.2025

Ihre Aufgaben

Unlock the Secrets of Cell Membranes - Join Our Research Team at Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

About Us:

We are seeking an enthusiastic candidate for a Ph.D. position in our lab specializing in cutting-edge theoretical and computational membrane biophysics. Our research delves into the complex interplay between the composition, structure, organization, and dynamics of cell membranes and its cellular function. We are located at the Friedrich-Alexander University of Erlangen-Nürnberg, a vibrant academic center with a focus on immunobiology and home to the National High-Performance Computing Center NHR@FAU. We are member of NHR@FAU and of the International Max Planck Research School (IMPRS) Physics and Medicine.

The Research Project:

Unraveling the Membrane-Selective Mechanism of Lugdunin: Insights into Specificity for Gram-Positive Bacteria and Antimicrobial Activity The project aims to investigate the membrane-selective mechanism of Lugdunin, a cyclic heptapeptide produced by Staphylococcus lugdunensis. Lugdunin exhibits remarkable activity against multi-resistant gram-positive bacteria while showing no toxic effects on gram-negative bacteria or human cells. Previous studies suggest that Lugdunin disrupts the membrane potential of pathogens such as Staphylococcus aureus by making the membrane permeable to protons□a mechanism that remains only partially understood.

Interdisciplinary Approach to Molecular Mechanism Research The specificity of Lugdunin for gram-positive bacteria is hypothesized to result from their unique membrane lipid composition, which facilitates the peptide□s integration and antimicrobial activity. To unravel this mechanism, the study combines in collaboration with Prof. Claudia Steinem□s group in Göttingen cutting-edge experimental and computational methods. Together, the teams investigate the interactions of Lugdunin with membranes that mimic the characteristics of gram-positive, gram-negative, and eukaryotic cells.

The project aims to identify the molecular interactions and structural determinants underlying the antimicrobial activity and membrane selectivity of Lugdunin. These findings could pave the way for the development of novel antimicrobial peptides and innovative approaches to combat infections caused by multi-resistant bacteria.

Collaborative Research Strengthens Antimicrobial Science The collaboration between FAU Erlangen-

Nürnberg and the University of Göttingen represents a significant step toward addressing fundamental questions in antimicrobial research. The DFG's funding highlights the importance of this project in the global fight against multi-resistant bacterial infections while offering new therapeutic perspectives.

Your Profile:

Educational Background: Ideally, you hold a master's degree in bio-/physics, theoretical/computational chemistry, life sciences, or a related field.

Interdisciplinary Interest: Strong passion for interdisciplinary projects and collaboration with experimental physics, chemistry, medical and immunology groups.

Communication Skills: High proficiency in English and effective communication skills.

Team Player: Ability to thrive in a collaborative and dynamic research environment.

Why Choose Erlangen?

Erlangen stands as a center for immunobiology, with over 70 groups dedicated to immunological research. Additionally, Biophysical research in Erlangen was boosted by settlements of the Max-Planck Institute for the Physics of Light, and the Max-Planck-Center for Physics and Medicine. The National High-Performance Computing Center in Erlangen focuses on cutting-edge atomistic simulations, providing a stimulating environment for scientific innovation. It provides exceptional computing resources to our research on biomembranes.

Application Process:

Interested candidates should submit a PDF document comprising a cover letter, CV, and certificates to rainer.boeckmann@fau.de.

Join Us in Shaping the Future:

Embark on a journey of groundbreaking research and contribute to the advancement of computational membrane biophysics. By joining our team, you become part of a collaborative research initiative, joining forces of biophysics and immunology.

Ihr Profil

Notwendige Qualifikationen:

Candidates should preferably hold a master degree in bio-/physics, theoretical/computational chemistry, life sciences or similar and a strong interest in interdisciplinary projects and collaborations to medical/immunology groups.

Stellenzusatz

Befristetes Forschungsvorhaben

Applications are assessed as they are received. The position will be filled on a rolling basis. Interested

candidates should send one pdf document containing a cover letter, CV, and certificates to: rainer.boeckmann@fau.de

Interessiert?

Die vollständige Stellenausschreibung sowie alle Infos zum Bewerbungsverfahren finden Sie hier: