Leibniz Institute for Food Systems Biology at the Technical University of Munich

PhD Student (m/f/d)

The Leibniz Institute for Food Systems Biology at the Technical University of Munich (LeibnizLSB@TUM), a legal foundation under civil law based in Freising, is a prominent member of the Leibniz Association. Our institute integrates cutting-edge biomolecular research, bioinformatics, and high-performance analytical technologies to explore the complex interactions between the human organism and food components.

To strengthen our research group **Mechanoreceptors & Sensory Biophysics / Section II**, we are currently looking for a committed PhD Student to start on 01/12/2026. The position is part-time (TV-L 13, 65%) and initially limited to 30/11/2029. Our research group investigates the molecular and biophysical mechanisms underlying food perception, with a particular focus on sensory receptors, food–receptor interactions, and mouthfeel. Using advanced nanobiophysical methods, especially atomic force microscopy (AFM), we study molecular interactions and the mechanical properties of biological membranes and cells to better understand how food components influence taste perception and oral sensory experiences.

Research project

Advances in structural biology and AI-guided protein design are opening new possibilities for understanding and engineering proteins involved in taste perception. This interdisciplinary project aims to develop novel protein agonists targeting the human sweet taste receptor (TAS1R2/TAS1R3) by combining computational protein design, molecular dynamics (MD) simulations, and experimental biophysical validation.
The experimental part of the project focuses on investigating protein-receptor interactions at the single-molecule level using atomic force microscopy (AFM). In particular, AFM-based single-molecule force spectroscopy (SMFS) will be employed to characterize the binding behavior of natural sweet proteins, engineered variants, and AI-designed candidates. By quantifying binding specificity, interaction forces, and dissociation kinetics, the experimental results will provide critical validation of computational predictions and contribute to an iterative design–predict–validate workflow.

Key Responsibilities

- Establish and optimize AFM-based single-molecule force spectroscopy assays to investigate protein-receptor interactions.
- Investigate the binding of natural and engineered sweet proteins to TAS1R2/TAS1R3 receptors in lipid nanodiscs and cell-based membrane models.
- Quantify binding probabilities, unbinding forces, and dissociation kinetics to characterize molecular interaction mechanisms.
- Experimentally validate and complement computational predictions from protein structure modelling and MD simulations.
- Collaborate closely with computational and molecular biology researchers to establish structure-function relationships and support the development of novel sweet protein agonists.

Your Profile

The ideal candidate holds a Master's degree in biophysics, physics, biochemistry, molecular biotechnology, biology, or a related discipline, with a strong interest in experimental molecular biophysics and protein interactions.
Experience with atomic force microscopy, particularly force spectroscopy, or other single-molecule biophysical techniques is highly desirable. Familiarity with membrane proteins, protein biochemistry, or cell culture techniques would be an advantage. Basic knowledge of data analysis and statistical evaluation, ideally using Origin PRO, MATLAB, or similar software, is welcome.
We are looking for a curious, motivated, and enthusiastic researcher who enjoys experimental work, is eager to develop new methodologies, and is interested in working at the interface of biophysics, molecular

biology, and AI-driven protein design. Strong communication skills in English, the ability to work independently, and a collaborative mindset are essential.

We offer you

- a thorough induction into your area of responsibility
- a diverse range of training and development opportunities for professional and personal development
- Opportunities for health promotion and work-life balance
- an appreciative, collegial working atmosphere with flat hierarchies and short decision-making paths
- an interesting and responsible field of work in the context of non-university cutting-edge research
- flexible working hours with the option of mobile working (home office)
- Company pension scheme (VBL) and annual bonus payment
- a motivated team that is looking forward to welcoming you!

Equal Opportunities and Diversity

Leibniz-LSB@TUM is committed to equal opportunities, diversity, and a respectful working environment. We welcome applications regardless of gender, nationality, ethnic or social origin, religion or belief, disability, age, or sexual orientation and identity.

Applicants with severe disabilities or those with equivalent status will be given preferential consideration in cases of essentially equal qualification (§ 2 SGB IX).

Contact and Application

For any questions on current topics, please contact:
Melanie Köhler (m.koehler.leibniz-lsb@tum.de**)**.

More information on the working group can be found here: https://www.leibniz-lsb.de/forschung/forschungssektionen/sektion-iii.

Please send your application, including a comprehensive CV and transcripts as well as names of three potential references, as a PDF file and stating the reference number **2026-22-MSB-MK** via email to:
Katharina Ranner recruiting.leibniz-lsb@tum.de.

We look forward to receiving your application!

Data Protection Notice:

As part of your application for a position at Leibniz-LSB@TUM, you will transmit personal data. Please refer to our data protection information in accordance with Article 13 of the General Data Protection Regulation (GDPR) regarding the collection and processing of personal data in the context of your application. By submitting your application, you confirm that you have taken note of the Leibniz-LSB@TUM data protection information.