



Universität Regensburg

Postdoc position in Synthetic Microbiology (biosensor engineering and design)

The University of Regensburg is an innovative and interdisciplinary campus university featuring innovative research and an attractive teaching programme for over 20,000 young students from different countries and disciplines. At the Faculty of Biology and Preclinical Medicine, a new research group and professorship in Synthetic Microbiology was recently founded. The team led by Prof. Dr. Markus Jeschek focusses on the development of synthetic microbes for sustainable bio-production of value-added chemicals and products. To achieve this, a broad range of microbiological and molecular biology methods including state-of-the-art DNA library generation and next-generation sequencing are applied. The combination of ultrahigh-throughput experimental data generation with state-of-the-art big data approaches (e.g. machine learning) is a core focus of the group's research. Furthermore, the professorship offers a variety of courses for students in biochemistry, biology and chemistry.

Project description: Our team specializes in the development of molecular tools and experimental techniques that enable high-throughput characterization of gene regulatory elements, proteins/enzymes and multi-protein systems in bacteria. Our vision is to precisely understand and model microbial systems using data-driven approaches in order to rationalize their engineering for sustainable bioprocesses. In this project, we will extend a new method for ultradeep Acquisition of Sequence-Phenotype Interrelations (uASPIre^{[1],[2]}) towards the characterization of genetically-encoded biosensors in *E. coli*. Naturally, cells use such biosensors to detect environmental signals and trigger gene expression in response. This “molecular sensing” principle shall be repurposed in this project to detect and discriminate biotechnologically produced chemicals. Specifically, we will investigate and model how changes in a biosensor's sequence affect its sensory spectrum to enable biosensor design “à la carte” by combining state-of-the-art techniques for cloning and library generation with next-generation sequencing and data analysis. The designed biosensors will be used to improve production of value-added chemicals, detect and degrade pollutants, and may have a high potential for application in diagnostics and treatment.

We are looking for a Postdoc (m/w/d) with a strong background/PhD in synthetic/molecular (micro-)biology, biochemistry, biotechnology, or related fields and a keen interest to develop new tools to better understand and engineer microbial cell factories. Previous hands-on experience in cloning and cultivation of microorganisms as well as a willingness to engage in collaborative, interdisciplinary research are key qualifications. Expertise in next-generation sequencing (Illumina, PacBio) and corresponding data analyses are a plus. The development of own concepts and projects within the greater area of the group's research focus is expected.

We offer an excellent on-the-job introduction, continuous career mentoring and a pleasant working environment in a young and dynamic team. The possibility to collect experience in teaching and supervision is provided and encouraged. A competitive salary and benefits are offered in alignment with Bavarian federal state regulations (TV-L) depending on experience. The contract is initially for two years and may be extended to a position with central responsibilities and the opportunity to critically shape the group's future development. The University of Regensburg is an equal-opportunity employer and encourages applications by female and diverse researchers. In case of comparable qualification, applicants with disabilities will be treated with preference.

The position is to be filled as soon as possible. Applications (compiled single pdf with cover letter, CV, track record and relevant documents) and questions regarding the position should be addressed to Prof. Dr. Markus Jeschek (markus.jeschek@ur.de).

References:

- [1] Höllerer, Papaxanthos, Gumpinger, Fischer, Beisel, Borgwardt, Benenson & Jeschek. Nat. Commun. 11: 3551 (2020).
- [2] Höllerer & Jeschek. bioRxiv 10.1101/2022.05.02.490318 (2022).