



At the Institute of Synthetic Biology in the faculty of Mathematics and Natural Sciences of Heinrich Heine University Düsseldorf two posts as a

scientific employee (m/f/d)

(65,00 %, pay grade 13 TV-L)

are to be occupied starting 01.03.2023. The employment is limited until 31.12.2026. It is a qualification position in the sense of the Act of Academic Fixed-Term Contract (Wissenschaftsvertragsgesetz – WissZeitVG), which is to promote the scientific qualification of the employee.

The advertised project is integrated into CRC 1535 MibiNet “Microbial networking – from organelles to cross-kingdom communities” and the associated graduate research training group “MibiNet”. In addition to the HHU as the host university, CRC 1535 includes five cooperation partners, including the Research Center Jülich (FZJ), the Technical University of Aachen (RWTH), the University of Bielefeld, the University of Cologne and the Max Planck Institute for Plant Breeding Research (MPIPZ) in Cologne. Further job offers can be found on our homepage (www.sfb1535.hhu.de).

Post 1:

Angomonas deanei is a non-pathogenic trypanosomatid that contains a single proteobacterial endosymbiont. Intriguingly, cell cycles of host and endosymbiont are synchronized and the symbiont is tightly associated with several host cell glycosomes. Previously, we identified host proteins that apparently control the cell cycle of the endosymbiont. Furthermore, we found that a gene that was transferred from the endosymbiont to the host cell nucleus encodes a metabolic enzyme that now localizes to the endosymbiont-associated glycosome, likely adjusting the metabolic capacity of the glycosome to the needs of the endosymbiont. Aims of the proposed project are 1. to explore host-symbiont metabolic integration with a special focus on the role of the glycosome in this process; 2. to establish advanced optogenetic tools for *A. deanei* that will be instrumental in scrutiny of host-symbiont interactions; and finally, 3. to establish a synthetic endosymbiosis system in mammalian cells that will allow us to study basic questions regarding host-symbiont interaction (e. g. by reconstructing processes such as nuclear control over endosymbiont division in an orthogonal system).

Your tasks:

- Development, characterization and implementation of optogenetic tools (e. g. light-regulated gene expression systems, subcellular localization control) in animal cells and in *A. deanei* in close collaboration with the group of Eva Nowack at the Institute of Microbial Cell Biology
- Establishment and characterization of synthetic endosymbiosis in mammalian cells

Post 2:

Optogenetics relies on the engineering of microbial and plant photoreceptors to transduce information in the form of photons into a molecular function, mediated e.g. by a change in protein conformation or enzymatic activity, that is in turn used to control a wide range of cellular processes. In this project we will systematically design, engineer and implement light-sensitive switches for the spatiotemporal and quantitative control of mRNA and protein expression, stability and subcellular localization. In particular, we will apply the optogenetic tools in the fungus *Ustilago maydis* to study mRNA intracellular transport and mitochondrial function.

Your tasks:

- Engineering, characterization and optimization of optogenetic tools for the light-regulated control of gene expression, mRNA and protein stability and subcellular localization in eukaryotes
- Implementation of the optogenetic tools in *U. maydis* to study mRNA intracellular transport and mitochondrial metabolism and physiology in close collaboration with the Feldbrügge group

Our requirements:

- A completed scientific university education (M.Sc. / M.A. / Diploma / Magister) in the field of Biology, Microbiology, Biochemistry or equivalent fields
- An excellent academic track record
- Experimental experience in molecular biology, microbiology, animal cell culture, and/or biochemistry
- Experience in confocal microscopy would be of advantage
- Very high motivation for experimental work, independent literature search and scientific writing
- A spoken and written command of the English language is desirable
- Affinity to teamwork
- Good communication skills and enthusiasm for interdisciplinary exchanges are appreciated

The pay scale grouping will be, depending on the personal qualification of the applicant, up to pay grade 13 TV-L.

In principle, the employment can also take place part-time, if no compelling official reasons are opposed in an individual case.

Heinrich Heine University Düsseldorf aims at increasing the percentage of employed women. Applications from women will therefore be given preference in cases of equal aptitude, ability and professional achievements unless there are exceptional reasons for choosing another applicant. Applications from suitably qualified severely disabled persons or disabled persons regarded as being of equal status according to Book IX of the German Social Code (SGB – Soziales Gesetzbuch) are encouraged.

Your contact person in case of questions is Dr. Lilli Bismar; email: sfb1535-application@hhu.de.

Please submit your application documents (cover letter, CV and certificates, additional references or resp. contact details) citing **reference no. 101.23 – 3.1** until **16.02.2023** preferably by email to:

sfb1535-application@hhu.de

or in writing to:

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Faculty of Mathematics and Natural Sciences
Institute of Microbiology
Attn. Dr. Lilli Bismar
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Please do not submit application materials in folders and be sure to send copies only, as documents will not be returned (they will be destroyed after the selection procedure has been completed).