



At the Institute of Microbiology in the faculty of Mathematics and Natural Sciences of Heinrich Heine University Düsseldorf a post as a

scientific employee (m/f/d)

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

is 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 “MibiNeXt”. 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).

Lichens are among the most ancient and fascinating examples of complex microbial networking. In lichens, an algal or cyanobacterial photobiont tightly physically associates with a fungal mycobiont to establish an intimate mutualistic interaction. In this project, we will employ comparative genomics and transcriptomics to identify carbohydrate-binding proteins and antimicrobial proteins from a *Peltigera* mycobiont and uncover how they shape establishment and maintenance of a lichen community. Our approach will combine a biochemical and functional analysis of candidate proteins with their application in the establishment of a synthetic microbial consortium.

Your tasks:

The aim of the proposed PhD project is to gain insights into fundamental principles of a natural lichen community. How is growth of the community members restricted and a tight physical association achieved? The future candidate combines computational structural approaches with biochemistry and cell biology to investigate the molecular repertoire of a cyanolichen community. A catalogue of antimicrobial, antifungal and other proteins with a potential influence on the lichen community will be generated. This molecular toolset will be used for a controllable production of candidate proteins with antifungal and -microbial properties in *U. maydis* in synthetic communities. Furthermore, a surface display system for *Ustilago maydis* will be developed using structure-guided protein design to expose lichen carbohydrate binding proteins on the surface of fungal cells. Collectively, the future candidate will uncover how defined hypotheses derived from studying natural symbioses can be addressed with synthetic cross-kingdom communities.

Our requirements:

- A completed scientific university education (M.Sc. / M.A. / Diploma / Magister) in the field of Biology, Microbiology, Biochemistry or equivalent fields
- Experimental experience in molecular biology, biochemistry and/or microbiology
- Knowledge in structural biology and a strong interest in biochemical problems would be of advantage
- Very high motivation to do experimental work as well as an ability for independent literature search and scientific writing in English
- 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. 103.23 – 3.1** until **16.02.2023** preferably by email to

sfb1535-application@hhu.de

or in writing to:

Heinrich Heine University Düsseldorf
Faculty of Mathematics and Natural Sciences
Institute of Microbiology
Attn. Dr. Lilli Bismar
Build. 26.24.01
Universitätsstraße 1
40225 Düsseldorf



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).