

Job advertisement no. 131/2024

The department **MICA - Anti-infectives from Microbiota**, led by Prof. Christine Beemelmans at the Helmholtz-Institute for Pharmaceutical Research Saarland (HIPS) in Saarbrücken, is offering a position as

Doctoral Researcher (f/m/d)

Project title:

Heterologous expression of cryptic gene clusters for the discovery of novel antibiotics

The Helmholtz Institute for Pharmaceutical Research Saarland (HIPS) focusses on identifying and developing new treatment options for infectious diseases with an emphasis on natural product research. Especially researchers in the department of *Microbial Natural Products* are aiming to identify, investigate and optimize novel natural product based actives, applying diverse approaches and methods mainly from the field of biotechnology, microbiology, molecular biology and biochemistry. HIPS was jointly started in August 2009 by the HZI in Braunschweig and Saarland University on Campus Saarbrücken.

In 2015 HIPS moved into a new 4500 m² research building in which currently 220 international employees work. HIPS represents the first and only publicly funded extra-university research unit in Germany dedicated to pharmaceutical research. The Institute collaborates with universities and various industries both nationally and internationally.

The research project aims to study **cryptic biosynthetic pathways encoded in protective bacterial symbionts**. The newly generated knowledge should be transformed into novel natural products with protective (e.g. antibiotic) properties and biochemistry amiable for biotechnological processes.

The PhD project encompasses several key components and tasks:

- 1. Genome Mining of Marine Bacterial Genomes and Metagenomics Datasets**
 - Undertaking genome sequencing efforts to explore (meta)genomes.
 - Evaluation of gene cluster pathways of hybrid character (e.g. PKS-NRPS combinations).
- 2. Heterologous Expression of Small Hybrid Gene Clusters:**
 - Design of gene constructs for expression in the host(s) of choice.
 - Optimizing heterologous expression conditions
 - Genetic manipulation of gene clusters and monitoring of product scaffolds by e.g. single point mutations, module exchange etc.
- 3. Metabolomic Analysis of Heterologous Products:**
 - Utilizing high-resolution mass spectrometry to monitor product production.
 - Identify products using advanced analytical tools (collaborating with experts).

In this project, the successful candidate will contribute to genome sequencing efforts, focusing on identifying cryptic gene clusters encoded within (meta)genomes. Heterologous expression of selected sequences in different hosts will be carried out with subsequent monitoring of product production using high-resolution mass spectrometry. Collaborative efforts will involve using state-of-the-art analytical tools for product identification. The heterologously expressed biosynthetic enzymes will be tested for substrate scope and biochemical properties. This multi-faceted approach will enable the candidates to gain expertise in advanced molecular biological, biochemical and analytical tools with the aim to identify novel natural products with anti-infective properties.

Qualifications:

- Master degree or equivalent in Life Sciences, Biotechnology, Pharmacy Chemistry, or related fields.
- Strong understanding and hands on experience in laboratory and analytical techniques, in particular PCR and cloning techniques, primer design and knock-out studies
- General understanding of chemical and biochemical transformations
- Ability to pay attention to details, pursue research independently and work in a goal-oriented manner.
- Willingness to work in a plural, collegial, international and interdisciplinary environment.
- Excellent English communication skills (written and spoken); very good skills in scientific writing

Disabled persons are given preference in the case of equal professional qualification. The HIPS aims for a corporate culture of appreciation and promotion of equal opportunities between women and men. The position is suitable for part-time work.

Advantageous for this position:

- Experience in next-generation sequence methods/techniques
- Isolation of bacterial strains, microbial cultivation techniques, phylogenomic analyses
- Analysis of metabolites using hyphenated MS-based techniques

We offer:

- modern laboratories and state-of-the-art instrumentation
- a dynamic and international research environment
- extensive further training opportunities and the opportunity to enroll in a structured PhD program
- unique network of excellent partners to support your research endeavors
- 30 days vacation (24.12. & 31.12. are considered as completely free days)
- an annual additional payment (Weihnachtsgeld) analogue to § 20 TVöD
- social security included
- flexible working hours and workplace design
- DO IT- PhD initiative <https://www.helmholtz-hzi.de/de/karriere/do-it-doktorandeninitiative>
- Welcome Office, Family Office
- Buddy System for new doctoral researchers

Starting date:	as soon as possible , 2024 or early 2025 - initial contract for 3 years.
Salary:	a like E13 TVöD/Bund (55%)
Probation period:	6 months
Working place:	Saarbrücken
Published:	02 October, 2024
Closing date:	30 October, 2024
Application:	Applicants are required to complete the online application form here: https://hzi.opencampus.net/ (Please select Job No. 131/2024)

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