HZI HELMHOLTZ Centre for Infection Research

HIPS HELMHOLTZ Institute for Pharmaceutical Research Saarland

Job advertisement no. 040/2024

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

Doctoral Researcher (f/m/d)

Project title: Structure Elucidation, Total Synthesis and Chemical Biology of Bioactive Marine Natural Products

In our ERC-funded research project (Starting Grant MORPHEUS), we study the function and origin of natural products in the interspecies interaction between marine bacteria and marine eukaryotes. Since natural products with high bioactivities are often produced only in minute abundancies, we use total synthesis to elucidate the structure of novel natural compounds, test their biological activity and use derivatives thereof for structure-activity relationship (SAR) and mode of action (MoA) studies.
In light of our recent studies on a novel microbial natural products of marine origin that exhibits unusual antibiotic activities, we are looking for a highly motivated organic chemist or chemical biologist to join our lab at the interface between chemistry and biology. To enable the determination of the absolute structure of this peculiar marine natural product, we have elaborated on two retrosynthetic approaches to reach the goal of its total synthesis. The prospective PhD candidate will be able to elaborate on the different envisioned modular synthetic routes, optimize synthetic steps and finalize the synthesis of natural product as well as derivatives. The intrinsic bioactivities of the natural product will allow plethora of bioactivity studies in the final phase of the PhD project and this will enable the prospective PhD candidate to gain also expertise in various chemical biology techniques and analytical methods for the in depth study of novel biological active compounds.

The PhD project encompasses several key components and tasks:

1. **Total Synthesis of Natural Products:**
    - Retrosynthetic analysis of natural products.
    - Optimization of synthetic methodologies for precursor synthesis.
    - Multi-step synthesis of natural products and their corresponding derivatives for structure elucidation purposes and biological testing (SAR-studies).
2. **Design of Chemical Probes derived from Natural Products:**
    - Design and synthesis of chemical probes allowing mechanism of action studies using different click chemistries (e.g. SuFEx, cycloaddition, thiol-ene, etc. …).
    - If interested, pull-down or proteomics experiments can be performed together with colleagues from biology/biochemistry.
3. **Isolation and Structure Elucidation of Natural Products from Marine Origin:**
    - Collaborate with colleagues from biology to further purify natural products from microorganisms using various chromatographic techniques (ion exchange, size exclusion, C_{18} and high pressure liquid chromatography).
    - Structure elucidation of related natural products (NMR, MS^2, x-ray, chemical derivatization).
    - Optional: Fermentation of microorganisms and optimization of the process to increase natural product production.

Qualifications:

- Master degree or equivalent in (Bio) Organic Chemistry or Chemical Biology.
- Strong hands on experience in multi-step synthesis, purification (HPLC) as well as characterization (NMR, MS, IR, UV, etc.) of organic compounds.
- Good understanding of biochemical methods and the willingness to acquire knowledge regarding chemical biology and ecology to be able to fully integrate into our interdisciplinary team.
- Experience in stereoselective synthesis and the preparation of chemical probes is a plus.
- Ability to pay attention to details, pursue research independently and work in a goal-oriented manner.
- Willingness to work in a plural, collegial, international (co-workers come from 30+ countries) 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.

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

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 m^2 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.

Starting date:	**as soon as possible,** 2024 - initial contract for 3 years.
Salary:	alike E13 TVöD/Bund (55%)
Probation period:	6 months
Working place:	Saarbrücken
Published:	**04 March, 2024**
Closing date:	**01 April, 2024**
Application:	Applicants are required to complete the online application form here: https://hzi.opencampus.net/ (Please select Job No. **040/2024**)

For further information, please contact Prof. Christine Beemelmanns directly by email: christine.beemelmanns@helmholtz-hips.de