Job advertisement no. 185/2023

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:
Heterologous expression of cryptic gene clusters and biosynthetic pathway analyses

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 ERC-funded research project is part of the ERC Starting Grant MORPHEUS, which studies the function and origin of bacterial natural products and biomolecules involved in the cell differentiation processes and defense of marine organisms.

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 hybrid gene cluster pathway constructs.

2. **Heterologous Expression of Small Hybrid Gene Clusters:**
   - Design of gene constructs for expression in the host(s) of choice.
   - Optimizing heterologous expression conditions

3. **Metabolomic Analysis of Heterologous Products:**
   - Utilizing high-resolution mass spectrometry to monitor product production.
   - Identify products using advanced analytical tools (Collaborating with experts).

4. **Manipulation of Gene Clusters and Monitoring of Product Scaffolds:**
   - E.g. Single point mutations, module exchange

5. **Analysis of wild-type producers**
   - Microbial cultivation techniques

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. The biosynthetic pathways expressed heterologously will be tested for substrate scope and biochemical properties. Simultaneously, wild-type microbial producers will be cultivated and analyzed to characterize the natural product portfolio. Collaborative efforts will involve using state-of-the-art analytical tools for product identification.
This multi-faceted approach will enable the candidate to gain expertise in microbial cultivation techniques and apply advanced molecular biological and analytical tools for the identification of novel natural products.

Qualifications:
- Master degree or equivalent in Life Sciences, Biotechnology, Pharmacy Chemistry, or related fields.
- Strong hands on experience in laboratory and analytical techniques.
- General understanding of molecular biological approaches, 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 professional equality between women and men. The position is suitable for part-time work.

Advantageous for this position:
- Experience in next-generation sequence methods/techniques
- Experience in DNA isolation, PCR and cloning techniques
- Isolation of bacterial strains, microbial cultivation techniques, phylogenomic analyses

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
- a corporate culture of appreciation and promotion of equal opportunities
- Support for a better balance between work and private life through our family office

Starting date: February, 1st 2024 or later - initial contract for 3 years.
Salary: alike E13 TVöD/Bund (55%)
Probation period: 6 months
Working place: Saarbrücken
Published: October 23rd, 2023
Closing date: November 19th, 2023
Application: Applicants are required to complete the online application form here: https://hzi.opencampus.net/ (Please select Job No. 185/2023)

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