

Job Offer

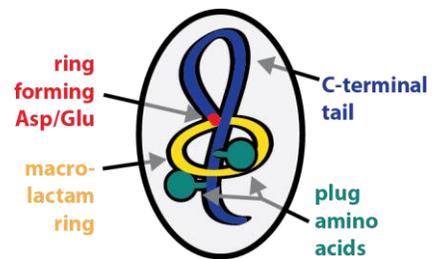
The Helmholtz-Institute for Pharmaceutical Research Saarland (HIPS), Group for Microbiota-Associated Natural Products, is seeking a

Master student in the field of natural product biochemistry (m/f/d)

The Helmholtz Institute for Pharmaceutical Research Saarland (HIPS) focuses on identifying and developing new treatment options for infectious diseases with an emphasis on natural product research. The research of the group *microbiota-associated natural products* is targeted at the discovery of new natural products from microorganisms found in the human microbiota with a particular interest in identifying new anti-infective agents. Towards this goal, the research group is applying diverse approaches and methods from the fields of biochemistry, microbiology, molecular biology, and biotechnology. 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 160 international researchers 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.

Your tasks:

Your project will revolve around microcin J25, an antimicrobial lasso peptide that is produced by an *E. coli* strain originally isolated from a human stool sample. Lasso peptides are a class of unique natural products belonging to the superfamily of *ribosomally synthesized and post-translationally modified peptides* (RiPPs). Their defining feature is an N-terminal macrolactam ring that is threaded by the linear C-terminal peptide tail. These fascinating threaded structures, which are reminiscent of the knot in a lasso (hence the name), are upheld merely by steric interactions mediated through large, bulky amino acids ("plugs") positioned above and below the ring. Despite the lack of further covalent stabilization, lasso peptides are extremely stable against proteolysis and other means of degradation. For example, microcin J25 was shown to withstand autoclaving at 120 °C and fully retained its antimicrobial activity!



Your project will have two major goals:

- 1.) Optimization of the heterologous production of microcin J25** by varying parameters like medium composition, cultivation conditions, and isolation procedures. This part of the project is very straightforward and will enable us to access higher quantities of the lasso peptide and variants thereof that will then be applied to activity screens and *in vitro* assays.
- 2.) Identification, isolation, and characterization of novel, naturally occurring microcin J25 variants.** Towards this goal we already identified various closely related homologs through genome mining, which will be heterologously produced by you using the same strategy than applied for the original microcin J25. Thereby, you will be able to assess how the naturally occurring variations in the microcin J25 scaffold affect its antimicrobial activity and selectivity.

For this project, you will work independently and apply a variety of biochemical, microbiological, and analytical methods. Hence, this project will enable you to get insights and experience in a variety important methods and techniques in this research field, including cloning, mutagenesis, cultivation, isolation of natural products and their purification by HPLC, mass spectrometric analysis, activity assays, and applying various basic bioinformatic tools.

Your profile:

We are looking for a master student with a background in chemistry, biology, pharmacy, or another relevant field. The applicant should have already gathered practical experience in project relevant fundamental biochemical and microbiological techniques, for example, DNA-related work procedures (PCR, agarose gel electrophoresis, etc.), work with bacterial cells (cultivation, heterologous expression, isolation of DNA, etc.), sterile working conditions, etc. Additional experience in HPLC-based purification of compounds and mass spectrometry is a plus but not a necessity.

We expect the candidate to be proficient in oral and written English to facilitate the communication in our international research environment. We are looking for a good team player, who is excited about working in a cross-cultural and interdisciplinary team, covering the domains of biology, chemistry, pharmacy, and biotechnology.

Equal opportunities are part of HZI's personnel policy. Severely disabled applicants will be favored if they are equally qualified. The position is suitable for part-time employment. Place of work is **Saarbrücken**.

Starting date: As soon as possible

Location: HIPS Saarbrücken

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For further information related to the position, please contact Dr. Julian Hegemann at julian.hegemann@helmholtz-hips.de

Please send your application referencing this job offer in a single pdf document containing a current CV, motivation letter (up to one page) and relevant certificates to the e-mail address above.