

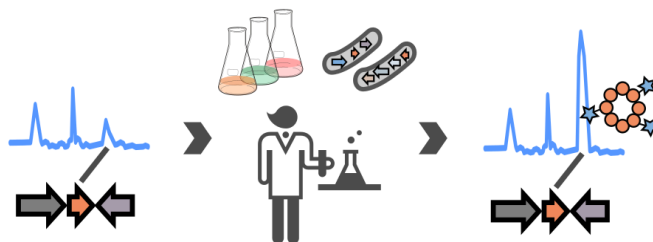
From Prototype to Production: Optimizing Microbial Peptide Yields

Supervisor	Ass.-Prof. Mitja M. Zdouc, Division of Pharmacognosy
Topic	Microbiology, Analytical Chemistry
Duration	6 Months (full-time), wet-lab only
Requirements	Bachelor in Pharmacy, Biology, or similar
Language	English/German

Description

RiPPs are **R**ibosomally synthesized and **P**ost-translational **P**eptides. This class of small molecules are produced by many microbes and show an impressive variety of biological properties, including antimicrobial activities [1]. While highly promising for drug discovery, RiPPs also present several challenges, including **low production titers** and **poor solubility**, complicating their consecutive isolation and characterization. However, strategies such as cultivation optimisation, molecular biology, and dedicated isolation protocols allow to address these challenges.

In this project, you will work on RiPP candidates that have **previously been selected** by rational prioritization for **targeted isolation**. Based on correlated genomic and metabolomics information, you will establish **cultivation and isolation protocols**, resulting in compound yields sufficient for extensive **bioactivity profiling and structural isolation**. This may include **molecular biology methods**, such as heterologous expression and/or overexpression, or **medium optimisation**. Furthermore, you will lead the **isolation efforts**, handling column chromatography and high pressure liquid chromatography (**HPLC**) instrumentation. Your efforts will be instrumental in delivering hit compounds that may have implications in the development of novel antimicrobials, sustainable agrochemicals, and selective food preservatives.



Learning outcomes

At the end of this Master thesis, you will be able to:

- **Perform** cultivation, extraction, and growth inhibition testing of bacterial strains.
- **Apply** molecular biology techniques or cultivation optimization to increase compound yield.
- **Use** analytical chemistry techniques and instruments for compound isolation and troubleshoot pitfalls
- **Present** findings in word and text and **understand** the manuscript writing process.

How to apply

Please contact Ass.-Prof. Mitja Zdouc via E-Mail (mitja.zdouc@univie.ac.at), indicating the progress of your studies, your preferred starting date, and if you fulfill the requirement criteria. Please include a brief statement about your research interest, why you would like to work on this project, any prior knowledge related to the topic, as well as preferred working style and supervision expectations. Applicants will be invited for a brief interview where the project will be discussed in detail.

References:

1 Arnison et al. 2013 Nat Prod Rep DOI: [10.1039/C2NP20085F](https://doi.org/10.1039/C2NP20085F)