



EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN



CSC-Tübingen PhD Scholarship Program

2025/2026 application round: prospective PhD positions at the University of Tübingen

Faculty: Science

Supervising Professor(s): *Apl. Prof. Dr. Evi Stegmann*

About the Supervisor: *I studied Biology and obtained my PhD in Microbiology at the University of Tübingen in 1999, working on the biosynthesis of EDDS in Amycolatopsis orientalis. I completed my habilitation in 2009 on glycopeptide antibiotic biosynthesis. Since 2013, I have been leading an independent research group at the University of Tübingen.*

The research focuses on the discovery and functional characterization of novel natural products from actinomycetes, with a particular emphasis on compounds exhibiting antibiotic activity. Using genome mining approaches, we identify biosynthetic gene clusters (BGCs) coding for structurally unique and bioactive secondary metabolites. Through the combination of genetics, biochemistry, and analytical chemistry, we elucidate biosynthetic pathways step by step. This mechanistic understanding enables us to optimize production and generate improved or novel derivatives using tools such as mutasynthesis and synthetic biology.

Key research areas include:

- *Genome mining for novel natural products*
- *Biosynthesis and pathway elucidation*
- *Synthetic biology and metabolic engineering*
- *Genetic manipulation of actinomycetes*
- *Producer strain self-resistance mechanisms*

Institute / Section / Subject: **Institute:** *Institute of Microbiology and Infection Medicine Tübingen (IMIT)*

Section: *Department of Microbial Bioactive Compound*

Subject: *Natural Product Biosynthesis*

Specification / Project title: *Elucidation of the biosynthesis of natural products in actinomycetes*

Topic Description: *The project focuses on the discovery and biosynthetic analysis of novel natural products from rare actinomycetes. Using genome*

mining approaches, BGCs encoding potentially bioactive compounds are identified and investigated. The goal is to elucidate their biosynthesis using genetic and biochemical methods, and to optimize production through metabolic engineering. This research contributes to the development of new antibiotics and improves our understanding of microbial secondary metabolism.

Type of the PhD Study:	<i>Full-time (complete doctoral studies at the University of Tübingen)</i>
Intended Degree:	<i>Dr. rer. nat., Interfaculty Graduate School of Infection Biology and Microbiology (IGIM)</i>
Required Degrees and	
Qualifications:	<i>Microbiology, Molecular Biology, Biochemistry, Biotechnology, Natural Products Chemistry, Genetics, Bioinformatics,</i> <i>Relevant expertise includes:</i> <i>Genome mining and analysis of biosynthetic gene clusters (BGCs), Microbial secondary metabolism, Genetic and biochemical methods for biosynthesis elucidation, Metabolic engineering and strain optimization, Natural product discovery and characterization</i>
Language Requirements:	<i>Applicants must demonstrate proficiency in English. Accepted formal language exams include TOEFL iBT with a minimum score of 95 or IELTS with a minimum overall band score of 6.5. Good scientific communication skills in English, both written and spoken, are essential. In addition to the formal requirements, knowledge of German or Chinese is considered an advantage but is not mandatory.</i>
Notes:	<i>Candidates should have strong motivation for interdisciplinary research and a keen interest in natural product biosynthesis and microbial metabolism. Prior experience with laboratory techniques in molecular biology, microbiology, or biochemistry is highly desirable. Willingness to collaborate in a multidisciplinary team and to engage in scientific discussions and presentations is expected.</i>