

The Department of Microbiome Science of the Max Planck Institute for Developmental Biology in Tübingen is inviting applications for a



MAX-PLANCK-GESELLSCHAFT

Master thesis in MALDI Mass Spectrometry Imaging (m/f/d)

The main task of this master thesis is the establishment of a MALDI-based technique for the identification, characterization and spatial localization of bacterial sphingolipids in host tissue sections using mass spectrometry imaging.

Sphingolipids represent a major class of lipids that are constituents of eukaryotic cellular membranes and play vital roles in cell signaling. In bacteria, sphingolipid synthesis is phylogenetically highly restricted. Different from most phyla, Bacteroidetes, one of the most prevalent phyla in the mammalian gut, are capable of sphingolipid *de novo* synthesis. Gnotobiotic mouse experiments have shown that these bacterial sphingolipids can impact host lipid metabolism and homeostasis, highlighting their role in bacteria-host communication.

Aiming for studying the underlying mechanism we will utilize **high-resolution mass spectrometry**. As a first step, **lipid extracts** from overnight liquid cultures of wild type *Bacteroides thetaiotaomicron* and a sphingolipid-deficient mutant strain (SPT k/o) will be spotted onto a steel target in order to develop a **MALDI-based technique** for the **identification and characterization of bacterial sphingolipids**. This method will then be evaluated and further optimized using **intestinal tissue sections** and **mass spectrometry imaging**. For **spatial localization** of bacterial sphingolipids in the host, colonic tissue sections from mice that have received wild type *B. thetaiotaomicron* will be compared to sections from mice that have received the sphingolipid-deficient strain. Being able to locate and trace bacterial sphingolipids and their metabolites in the host will help us to shed light on **sphingolipid-mediated bacteria-host communication**.

What we offer:

- the opportunity to work in the Department of Microbiome Science, a member of the world-renowned Max Planck Society
- access to our Mass Spectrometry Core Facility
- a state-of-the-art high-resolution FT-ICR mass spectrometer equipped with a dual ESI/MALDI source (scimaX, Bruker)
- a laboratory with an established MALDI mass spectrometry imaging workflow
- an S2 laboratory for handling *B. thetaiotaomicron* and working with biological samples from gnotobiotic mouse experiments

We are seeking a highly motivated, responsible and reliable Master's student (m/f/d) to join our team. Please consider applying if you have a background in biology, microbiology, chemistry, or related fields. Some knowledge in mass spectrometry, MALDI mass spectrometry imaging and lipidomic analysis is highly appreciated but not required. Excellent English communication skills are beneficial.

The position (full-time) is available immediately. The timeframe is usually six months but can be tailored to suit the requirements of the applicant's particular study program.

Applicants should send their documents (in PDF form) including a cover letter, a CV, certificates, and timeline to Dr. Claudia Frick ✉ claudia.frick@tuebingen.mpg.de. Applications that are received by February 19 will be given preferential treatment.