

The Research Group „Microbial Interactions and Processes“ at the HZI in Braunschweig offers a

Master-Thesis

Title: Isolation and characterization of bile acid-converting microorganisms

The group Microbial Interactions and Processes (MINP) at the Helmholtz Center for Infectious Diseases (HZI) is looking for a Masterstudent to work in the field of gut microbiota. The specific aim is to isolate and characterize bacteria from human gut that form the secondary bile acids deoxycholic acid (DCA) and lithocholic acid (LCA) via the multi-step 7α -dehydroxylation from cholic acid and chenodeoxycholic acid, respectively. DCA and LCA play a central role in microbiota-host interactions as they protect against *Clostridium difficile* infection, whereas excessive concentrations are toxic and promote cancer of the colon and the liver. Only a few bacterial strains capable of this bile acid conversion are available and we recently demonstrated (based on omics techniques) that key bacteria involved are yet to be isolated. The project is in collaboration with Microbial Immune Regulation (MIKI) and integrated within larger efforts to investigate the role of secondary bile acids in health and disease and involves anaerobic culturing, molecular biology (qPCR, next generation sequencing), analytical techniques (targeted LC-MS/MS) and bioinformatic procedures (optional). The ideal candidate is interested in microbial ecology, bacteria-host interactions, is familiar with microbiological techniques and works independently.

Methods:

- Culturing bacteria under anaerobic conditions.
- Molecular biology (PCR amplification for next generation sequencing, qPCR).
- Bacterial kinetics/physiology.
- Analytics (targeted LC-MS/MS).
- Bioinformatic procedures to analyze NGS data (optional).

To apply or get more information please contact:
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https://www.helmholtz-hzi.de/en/research/research_topics/bacterial_and_viral_pathogens/microbial_interactions_and_processes/our_research/