



## Open position for the LSM call of applications

**Department/Institute:** Faculty of Biology, Microbiology

**Subject areas/Research fields:** Microbiology, Molecular Biology

**Keywords:** genetic engineering, *Desulfovibrio* spp., synthetic bacterial communities

**Name of supervisor:** Prof. Dr. Kirsten Jung

**Funding:** third party funding through the research group (BioSystem) or DAAD-GSSP (LSM)

**Project title:** **Reprogramming bacteria**

### Project description:

The human gut microbiota plays an important role in health and disease. Trillions of microorganisms, including bacteria, yeasts and viruses, the so-called commensals, live in the human digestive system in symbiosis with the host and support its health. In the healthy adult gut, the commensal bacteria are dominated by obligate fermenting bacteria of the phyla Firmicutes and Bacteroidota. A weakening of host functions that control parameters important for microbial growth generates abnormal growth conditions and niches for some bacteria, such as *Desulfovibrio* spp., which then harm the host.

In this project, we will:

1. Identify species-specific essential genes that can be targeted by a gene-editing approach.
2. Reprogram bacteria by gene-editing in synthetic bacterial communities.

We will develop and use a combination of genetic engineering methods, multi-omics approaches (transcriptomics, proteomics), and microbial assays (pairwise bacterial interactions, anaerobic synthetic consortia).

Reprogramming bacteria could pave the way to restoring a healthy gut microbiota in humans.

Strong experience in molecular biology and anaerobic cultivation techniques is required.

### References:

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**Research group website:**

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