



**Systems Biology
Seminar Talk**

**Drug-microbiome
interactions and
their consequences
on the host**

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14:00 CET**

**Lecture Hall 0.106
Allmandring 31
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Abstract:

The functionality of the gut microbiome is closely linked to a number of environmental factors that influence the microbiome composition. Among these factors, drugs are the most important contributors to inter-individual differences in gut microbiome signatures. Importantly, not only antibiotics, but also non-antibiotic drugs affect the gut microbiome composition. However, it is still unclear whether these drug-microbiome interactions influence the therapeutic efficacy of the drug or lead to individual side effects.

Based on our finding that enteropathogens are more resistant to non-antibiotic drugs than commensal gut microbes, we hypothesised that non-antibiotics alter the microbiome in ways that create opportunities for enteropathogens to thrive. Consequently, the consumption of non-antibiotic drugs could support the colonisation of bacterial pathogens. By combining advanced high-throughput cultivation methods for anaerobic gut bacteria with gnotobiotic and conventional animal models, we have identified drugs from different therapeutic classes that effectively promote colonisation with pathogenic *Gammaproteobacteria*. Particularly in immunocompromised hosts, such a drug-induced increase in pathogen load implies an increased risk of infection.

In the long term, a comprehensive understanding of the interactions between drugs and the gut microbiome promises to improve the efficacy of current therapies and guide the development of new drugs with reduced side effects.

CV:

Lisa Maier is a biochemist and infection biologist by training. She received her PhD from the Institute of Microbiology at ETH Zurich in 2014. During her postdoc in the laboratory of Nassos Typas at EMBL Heidelberg, she developed high-throughput methods for the systematic investigation of drug-microbiome interactions. Since 2019, she has been leading her independent research group at the University Hospital of Tübingen, where she was recently appointed to a full professorship. In her lab, she investigates whether drugs can be used to specifically modulate the human microbiome.