Natural Products from Bacteria and Fungi

Many compounds that are produced by bacteria and fungi can cause illnesses or intoxications. However, others are capable of curing diseases.

The aim of our research projects is to identify these pharmacologically relevant compounds as well as the toxins and to understand how they are produced in microorganisms.

On the basis of this knowledge we investigate the origin and types of disease-causing substances and try to produce new therapeutics. To achieve these goals, we combine chemical and biological methods. In addition, we are particularly interested in the communication of microorganisms and their interactions.

For the discovery of new biologically active compounds we do not only employ chemical analytics and synthetic methods but also genetics. On one hand we search for genes that are involved in the production of biologically active compounds. For this purpose we employ genome-mining approaches. On the other hand we exchange and recombine biosynthesis genes to obtain improved therapeutics.

Our research projects and areas of expertise include:

- Isolation and structure elucidation of bioactive compounds from bacteria and fungi
- Investigation of biosynthetic pathways of microbial secondary metabolism
- Design of biosynthetic pathways to generate new bioactive natural products
- Use of biological and chemical methods for the derivatisation of therapeutics
- Molecular basis of microbial interactions