PEPTIDE DRUGS FROM NATURE – STRUCTURAL AND (BIO)SYNTHETIC ASPECTS OF NEW ANTIBIOTICS

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Recently, peptides have gained increased interest as drugs, since they display properties which are unmet by small molecules or biologics. In nature, ribosomal (RiPPs) [1] and non-ribosomal peptides (NRPs) [2] from bacteria and fungi provide an enormous structural diversity which is linked to remarkable bioactivities, e.g. antibacterial, antifungal, anticancer and others. Next to classical screening approaches, the discovery of new bioactive peptides from nature meantime has embraced genome mining.

The lecture presents recent findings on the discovery, structure elucidation and biosynthesis of new peptide natural products with the potential to be developed as antibacterial drugs. These are the lipolanthines [3] and albicidin [4, 5], unusual RiPP and NRP structures with a remarkable activity against multi-resistant Gram-positive and Gram-negative bacteria of the ESKAPE-group. Furthermore, we will report on the biosynthetic and synthetic assembly of these compounds, as well as bioactivity and resistance mechanisms. In addition, the past years have seen an enormous progress in the understanding of biosynthetic assembly, e.g. unexpected biosynthetic findings for peptide backbone *N*-methylation [6], which also could impact the engineering and (re)design of structural diversity e.g. by combinatorial biosynthesis approaches.

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