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The Effect of Bacterial Natural Products on Multicellular Development

Social amoebae are ubiquitous, soil-dwelling eukaryotes with both a unicellular and a multicellular life cycle. The unicellular protists are voracious predators to bacteria and upon food depletion the amoebae aggregate and form fruiting bodies that enable the dispersal of their spores. In order to survive in the presence of amoebae, soil bacteria need to defend themselves against their predator. The secretion of toxic, bacterially produced secondary metabolites is a very effective defense strategy. Besides killing, it is possible to counteract the bacteria's predator by interfering with its multicellular life cycle thus effectively preventing dispersal of the amoebae. The aim of this project is to investigate the secondary metabolome of bacteria from our culture collection, which were shown to halt or alter the multicellular development of the social amoeba *Dictyostelium discoideum*. The PhD candidate will identify and elucidate the structure the bacterial metabolites that interfere with multicellular development and investigate their biological and ecological activities as well as their biosyntheses. The interdisciplinary project investigates the role of natural products in microbial communication and is thus ideally suited to be carried out within the ILRS framework.

Publications

Leichnetz D, Pflanze S, Beemelmans C (2019) Stereoselective synthesis of unnatural (2S,3S)-6-hydroxy-4-sphingenine-containing sphingolipids. *Org Biomol Chem* 17(29), 6964-6969. [Details](#) [PubMed](#)

Oberheide A, Pflanze S, Stallforth P, Arndt HD (2019) Solid-Phase-Based Total Synthesis and Stereochemical Assignment of the Cryptic Natural Product Aurantizolicin. *Org Lett* 21(3), 729-732. [Details](#) [PubMed](#)

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