

Name of PI:

Prof. Dr. Peter Proksch

Title of Ph. D. Project:

Natural Products from Marine Sponges and Fungal Endophytes as Leads for the Treatment of Chemoresistant Tumors and Microorganisms

Abstract:

Cancer as well as infectious diseases range among the most common causes of deaths worldwide. Treatment of these diseases is increasingly met with severe problems arising from resistance against currently available cytostatic drugs or antibiotics. Natural products have in the past been exceptionally successful leads for the treatment of cancers and microbial diseases alike with 50 – 70% of all anticancer drugs and antibiotics being either of natural origin or natural product like. Chances of finding new leads from nature are highest for hitherto barely investigated organisms such as marine invertebrates or fungal endophytes that live within higher plants. This project will focus on the isolation and spectroscopic structural identification of new cytostatic or antimicrobial leads from both sources. Fungi will be cultivated not only in axenic culture but also in mixed cultures with other microbes for induction of cryptic biogenetic gene clusters in order to exploit their full genetic potential with regard to new bioactive compounds. All compounds isolated will be investigated for their anticancer and antimicrobial properties in close collaboration with other groups that are involved in this Research Training Group.

Suggested Reading:

Frank M, Niemann H, Böhler P, Stork B, Wesselborg S, Lin W, Proksch P (2015) Phomoxanthone A - from mangrove forests to anticancer therapy. *Current Medicinal Chemistry* 22: 3523–3532.

Marmann A, Aly AH, Lin WH, Wang BG, Proksch P (2014) Co-cultivation—a powerful emerging tool for enhancing the chemical diversity of microorganisms. *Marine Drugs* 12: 1043-1065.

Daletos G, Kalscheuer R, Koliwer-Brandl H, Hartmann R, de Voogd NJ, Wray V, Lin WH, Proksch P (2015) Callyaerins from the marine sponge *Callyspongia aerizusa*: cyclic peptides with antitubercular activity. *Journal of Natural Products* 78: 1910-1925.