

THE KIEL CENTER FOR MARINE NATURAL PRODUCTS – INNOVATIONS IN MARINE BIOTECHNOLOGY

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The Kiel Center for Marine Natural Products (Kieler Wirkstoff-Zentrum KiWiZ) is a biotechnological research platform for marine natural products specifically from marine microorganisms covering aspects from the habitat to the hit for drug candidates. It has built up national, European and international networks to promote the research on bioactive substances from the laboratory to industrial application. The activities of KiWiZ include research on ecological aspects of natural products as well as on their biotechnological production. It performs studies on the biology and chemistry of marine natural products and their producers, marine bacteria and fungi. The exploration of the marine microbial biodiversity with respect to natural products, the development of methods for their biotechnological production with minimized risks for nature and man as well as their sustainable use is considered by KiWiZ.

The focus of the KiWiZ at GEOMAR is on identification, production and promotion of new natural products from marine microbial sources and the investigation of their biological activities and ecological function. Studies of the KiWiZ include all aspects from sampling, isolation and identification of the microorganisms in order to describe biodiversity, their preservation in culture collections, revelation of genomic potentials, as well as the extraction, purification, structure elucidation and characterisation of natural products from the cultured bacteria and fungi in order to describe and understand chemodiversity of marine microbes. In addition, optimisation of production conditions and scale up to a pilot scale for biotechnological production of bioactive natural products are considered as part of a sustainable approach for marine biotechnology. The research of KiWiZ relies on the extremely high diversity of marine microorganisms either newly cultured with special intention or contained in the large culture collections of KiWiZ containing marine bacteria and fungi covering more than 15.000 isolates, with a high proportion of new and unknown taxa. Important aspects became the growing panel of biological assay systems, in which suitability for specific applications is tested and the establishment of a substance library of pure marine natural products. With its unique setup and resources, the KiWiZ has developed into an excellent scientific centre on new natural products from marine microorganisms, being operated by an interdisciplinary team of scientists. Basic aspects on both biology and chemistry of marine natural products as well as applied research topics are considered. In addition to numerous publications and several patents, the strategy of KiWiZ in the frame of marine natural product research is included in a recent review on this topic (Imhoff *et al.*, 2011). Highlights of the research activities of KiWiZ and its networks will be presented.

References

Imhoff J.F., A. Labes and J. Wiese. 2011. Biomining the microbial treasures of the ocean: new natural products. *Biotechnol Advances* 29:468-482.