Microalgae in the postgenomic era: a blooming reservoir for new natural products.

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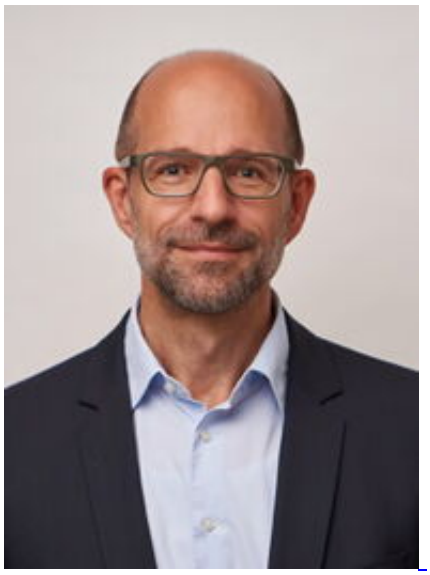
Abstract

Bacteria, fungi, algae and higher plants are the most prolific producers of natural products (secondary metabolites). Compared to macroalgae, considerably fewer natural products have been isolated from microalgae, which offer the possibility of obtaining sufficient and well-defined biological material from laboratory cultures. Interest in microalgae is reinforced by large-scale data sets from genome sequencing projects and the development of genetic tools such as transformation protocols. This review highlights what is currently known about the biosynthesis and biological role of natural products in microalgae, with examples from isoprenoids, complex polyketides, nonribosomal peptides, polyunsaturated fatty acids and oxylipins, alkaloids, and aromatic secondary metabolites. In addition, we introduce a bioinformatic analysis of available genome sequences from totally 16 microalgae, belonging to the green and red algae, heterokonts and haptophytes. The results suggest that the biosynthetic potential of microalgae is underestimated and many microalgal natural products remain to be discovered.

Beteiligte Forschungseinheiten

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