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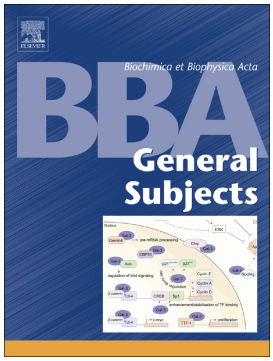

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Marine Natural Product Peptides with Therapeutic Potential: Chemistry, Biosynthesis, and Pharmacology

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Abstract:

The oceans are a uniquely rich source of bioactive metabolites, of which sponges have been shown to be among the most prolific producers of diverse bioactive secondary metabolites with valuable therapeutic potential. Much attention has been focused on marine bioactive peptides due to their novel chemistry and diverse biological properties. As summarized in this review, marine peptides are known to exhibit various biological activities such as antiviral, anti-proliferative, antioxidant, anti-coagulant, anti-hypertensive, anti-cancer, antidiabetic, antiobesity, and calcium-binding activities. This review focuses on the chemistry and biology of peptides isolated from sponges, bacteria, cyanobacteria, fungi, ascidians, and other marine sources. The role of marine invertebrate microbiomes in natural products biosynthesis is discussed in this review along with the biosynthesis of modified peptides from different marine sources. The status of peptides in various phases of clinical trials is presented as well as the development of modified peptides including optimization of PK and bioavailability.

Key words: Marine organisms, bioactive peptides, challenges, peptide isolation, biosynthesis, therapeutic peptides

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