Drug Development Using Marine Organisms: *From Ocean to Medicine*

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Abstract

The ocean, with its vast biodiversity, presents an invaluable resource for novel bioactive compounds with significant therapeutic potential. This presentation explores the discovery and development of key marine-derived pharmaceuticals, showcasing the remarkable journey from marine organisms to effective medical treatments. The ocean, with its vast and diverse ecosystems, has become an invaluable source for novel bioactive compounds with significant therapeutic potential. This abstract provides an overview of the history of drug development from marine sources, highlighting key pharmaceuticals, their unique characteristics, and future research directions.

Notable examples include Cytarabine, a synthetic derivative of marine sponge nucleosides, revolutionizing leukemia treatment; Conotoxins from cone snail venom, leading to the development of the pain management drug Ziconotide; Eribulin from marine sponge, inhibit microtubule growth in targeted metastatic breast cancers; Brentuximab Vedotin, an antibody-drug conjugate using a marine-derived toxin, demonstrating advancements in targeted cancer therapy; Polatuzumab Vedotin, an antibody-drug conjugate, for large B-cell lymphoma; and Ecteinascidin-743 from marine tunicates, offering new hope in treating soft tissue sarcoma and ovarian cancer. Each case highlights the critical role of marine natural products in modern pharmacology and underscores the importance of ongoing marine biodiversity research for future drug discovery.

The successful transition of these marine-derived compounds to clinically approved therapies exemplifies the ocean's potential in providing innovative solutions to complex medical challenges.