

Anti-Cancer Compounds of Cyanobacteria

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Abstract

Introduction: The ocean, which is called the “mother of origin of life,” is also the source of structurally unique natural products that are mainly accumulated in living organisms. The cyanobacteria (blue-green algae) are photosynthetic prokaryotes having applications in human health. Bioactive compounds of marine cyanobacteria have biological activity in deadly diseases like cancer.

Methods and Results: Peer-reviewed publications were identified through searches in pubmed, scopus, science direct and google scholar by using the search terms "anti-cancer," "bioactive compounds," "pharmaceutical agents," "cyanobacteria." In this search, 127 articles were found that studied 21 of them. Based on this search, anti-cancer compounds such as apratoxin A, tolyporphin, curacin A, dolastatin 10 in cyanobacteria act through mechanisms such as induction of G-1 phase cell cycle arrest, inhibition of microtubule dynamics, inhibition of actin filaments, inhibition of histone deacetylase, inhibition of proteasome activity, induction of apoptosis in cancer cells and inhibition epidermal growth factor receptor (EGFR).

Conclusions: The fact that cyanobacteria are one of the richest sources of known and novel bioactive compounds including toxins with wide pharmaceutical applications is unquestionable. Many compounds from cyanobacteria are useful for welfare of mankind. Advantage of cyanobacteria as an anti-cancer source for drug discovery lies in the economy of their cultivation compared with other microorganisms, as they require only simple inorganic nutrients for growth. Thus, it seems that the cyanobacteria have the potential for expanded utilization in drug discovery.

Key words: Anti-cancer compounds, Cyanobacteria

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