

<https://doi.org/10.7124/bc.000BA5>

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ANTITUMORAL ACTIVITY OF ACTINOBACTERIA ISOLATED FROM SPONGES OF THE BLACK SEA AQUATIC AREA

Recently, there has been a growing interest in finding safe natural alternatives to toxic chemotherapy drugs for the treatment of cancer patients. Marine actinobacteria are able to synthesize a wide range of biologically active compounds, including antibiotics, antioxidants, and cytotoxic substances. **The aim** of this work is to study the antitumor activity of marine actinobacteria isolated from sponges of the Black Sea. **Methods.** The study used 4 strains of marine actinobacteria isolated from sponges *Haliclona* spp. The strains were cultivated in Gause 2 medium in flasks with glass beads on a shaker for 12 days. The cell mass was separated by centrifugation. The supernatant was filtered and used in the studies. The culture of human rhabdomyosarcoma RD cells was cultured in a CO₂ incubator in polystyrene plates at 36 °C for 24 hours in DMEM medium (BioWest, France) supplemented with fetal bovine serum (FBS Premium, BioWest, France) and antibiotics. Actinobacterial exometabolites were added to the monolayer. Incubation was carried out for 24 hours. To assess cytotoxic activity, the monolayer was stained with methylene blue, and the optical density was measured on a microplate spectrophotometer (μQuant™, Bio-Tek, USA). **Results.** It was established that exometabolites of marine actinobacterial strains have a pronounced cytotoxic effect on human rhabdomyosarcoma cells at several levels: population (destruction of the monolayer), cellular (morphological changes), and subcellular (destruction of the cytoplasm, shrinkage, and pyknosis of the nuclei). Under the influence of metabolites of strains Hal 11 and Hal 15, a decrease in cell viability of 62% was observed compared to the control. According to the literature, it is known that marine actinobacteria are able to synthesize a wide range of secondary metabolites with antitumor activity. For example, in the metabolome of the Black Sea strains *Streptomyces* sp. Lim9.2 and Lim10, such biologically active compounds as campechic acid and cyanophycin were identified. Campechic acid is an inhibitor of tumor cell metastasis, and cyanophycin is a promising antitumor agent, close in mechanism of action to dolastatins – compounds whose effectiveness has been confirmed in clinical practice [1]. **Conclusions.** The Black Sea strains of actinobacteria Hal 11 and Hal 15, isolated from sponges, are producers of cytotoxic exometabolites promising for the creation of antitumor drugs.

Keywords: marine streptomycetes, exometabolites, cytotoxic activity, tumor cell cultures.

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Received: 08.06.2026; Accepted: 08.09.2026; Published: 29.09.2026

Citation: Ivanytsia V.O., Gudzenko T.V., Horshkova O.G., Strashnova I.V., Korotaeva N.V., Ivanytsia T.V. (2026) Antitumoral activity of actinobacteria isolated from sponges of the black sea aquatic area. *Biopolymers & Cell*, Special issue(42), 108. <https://doi.org/10.7124/bc.000BA5>

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