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Natural compounds as sources of new drugs: venoms and cancer

Biological Sciences

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Snake venoms contain various constituents that may be useful for medicinal purposes, and previous research has indicated that some snake venom components inhibit cancer cell proliferation by both general and specific mechanisms. Paradoxically, the creatures that many people fear may carry a possible treatment for an equally feared disease, cancer. The purpose of this study is to evaluate the effects of Ahaetulla snake venom and purified toxins on the proliferation of MCF-7 breast cancer cells. Our working hypothesis is that crude venom, as well as purified proteins, will inhibit cancer cell growth but show minimal effects on normal cells. Cells were cultured, subcultivated and then added to wells of a microtiter plate containing varying concentrations of Ahaetulla venom. After 24 hr incubation at 37 °C, cell proliferation in the presence and absence of venom was quantified (MTT assay). Initial results indicate that the venom contains potent anti-proliferative activities, an interesting observation in light of the fact that this potency does not correlate with overall venom toxicity, which is very low for mammals. This anti-proliferative effect was found to be contained in one component isolated by size exclusion fractionation of venom. We are currently purifying this venom protein(s) with the goal of obtaining a purified component(s) which will inhibit cancer cell proliferation but not affect normal cells. This research has the potential to discover novel compounds with specific anti-cancer properties, which in turn can assist in rational drug design.