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Brianne Broughton

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Inhibition of MCF-7 Breast Cancer Cell Proliferation by Using Snake Venom Purified Proteins: Exploring New Possibilities in Drug Development

Broughton, Brianne

Faculty Sponsor, Stephen Mackessy

Animal venoms contain various components that may be useful for medicinal purposes, and previous research has demonstrated 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 different venoms and purified toxins on the proliferation of MCF-7 breast cancer cells. Our working hypothesis is that some venoms 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 rattlesnake venoms. After 24 hour incubation at 37°C, cell proliferation in the presence and absence of venoms was quantified (MTT assay). Initial results indicate that many venoms contain potent anti-proliferative activities, but the level of potency does not correspond to overall venom toxicity (LD50). We are currently purifying several venom proteins from venoms showing high anti-proliferative activity and lower toxicity, with the goal of obtaining 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.