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Evaluation of the anticancer activities of the plant alkaloids sanguinarine and chelerythrine on human breast adenocarcinoma cells

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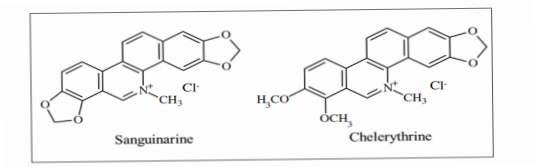
Breast cancer is associated with a high mortality rate around the world due to its aggressiveness and highly resistance to conventional therapies. Sanguinarine (SAN) and chelerythrine (CHE) are plant alkaloids extracted from Sanguinaria canadensis and Macleaya cordata, which have been studied for their bioactivities. In this study, it was observed that SAN was cytotoxic to human breast adenocarcinoma cells (MCF-7) at concentrations of 7.5 μM (24 and 48 hours), effectively reducing cell viability from the concentration of 10 μM for 24 hours and 7.5 μM for 48 hours, by the MTT test. CHE, in turn, was cytotoxic at concentrations of 10 and 20 μM (48 hours), but did not compromise the cellular viability. An analysis of the membrane integrity showed that both alkaloids did not affect the cell viability by using the propidium iodide uptake. The comet assay analysis indicated that SAN was genotoxic to the MCF-7 cells, with a significant increment of damage at 10 μM, while none of the tested concentrations of CHE showed a genotoxic effect. The flow cytometry analysis indicated that no cell cycle arrest was caused by both alkaloids, but SAN 10 μM induced a sub-G1 population, due to a significantly higher percentage of apoptotic or necrotic cells. Thus, the results of cytotoxicity, genotoxicity, and of the cell cycle monitoring that are presented in this paper have suggested that SAN has more of a chemotherapeutic activity, as well as having the potential for the development of new therapies for breast cancer, when compared to CHE.



Recent Publications

1. Almeida I V, Düsman E, Mariucci R G, Mantovani M S and Vicentini V E P (2014); Cytotoxicity and mutagenicity of fluoxetine hydrochloride (Prozac), with or without vitamins A and C, in plant and animal model systems; Genetics and Molecular Research. v.13, p.578 - 589.
2. Düsman E, Almeida I V, Lucchetta L and Vicentini V E P (2014); Effect of processing, post-harvest irradiation, and production system on the cytotoxicity and mutagenicity of Vitis labrusca L. juices on HTC Cells; Plos One. v.9, p.e107974.
3. Almeida I V, Domingues G, Soares L C, Düsman E and Vicentini V E P (2014); Evaluation of cytotoxicity and mutagenicity of the benzodiazepine flunitrazepam in vitro and in vivo; Brazilian Journal of Pharmaceutical Sciences. v.50, p.251 - 256.
4. Düsman E, Almeida I V, Coelho A C, Balbi T J, Tonin L T D and Vicentini V E P (2013); Antimutagenic Effect of Medicinal Plants Achillea millefolium and Bauhinia forficata in vivo; Evidence-Based Complementary and Alternative Medicine (Online). v.2013, p.1 - 6.
5. ALMEIDA I V, DÜSMAN E, HECK M C, PAMPHILE J A, LOPES N B, TONIN L T D, VICENTINI V E P (2013); Cytotoxic and mutagenic effects of iodine-131 and radioprotection of acerola (Malpighia glabra L.) and beta-carotene in vitro. Genetics and Molecular Research. v.12, p.6402-6413, 2013.

Biography

Igor Vivian Almeida is a Junior Professor and Researcher at the State University of Maringa, Brazil. His Doctoral thesis is under publication and has presented interesting insights on the anticancer activities of plant alkaloids, sanguinarine and chelerythrine, such as cytotoxicity, genotoxicity, cell cycle arrest and different ways of apoptosis induction on tumor and non-tumor cell lines. Some of his papers also present the effect of plant derivatives on chromosome aberration and genetic instability.

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