

THE POTENTIAL USAGE OF SELECTED NATURAL COMPOUNDS AS CHEMOTHERAPEUTIC AGENTS AGAINST CANCER

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ABSTRACT

OBJECTIVE

Medicinal plants containing active natural compounds have been used as an alternative treatment for cancer patients in many parts of the world, especially in Asia. In this report, we describe the cytotoxic and apoptotic properties of various plant natural compounds such as alkaloids, terpenes and phenyl propanoids from Malaysian flora on various human cancer cell types.

METHODOLOGY

MTT and Live/Dead assays were used as preliminary cell viability assays, while apoptotic induction effects were determined using flow cytometry, PARP cleavage and DNA fragmentation assays. Molecular pathway elucidation was conducted using a 28,769 element cDNA microarray and specific mechanisms were studied using Western blotting on specific key proteins. Investigation of combination chemotherapy potential was done *in vitro* in combination with gemcitabine-HCl, cisplatin and paclitaxel.

RESULTS

It was shown that the investigated compounds demonstrated significant cytotoxic and apoptotic effects in a time- and dose-dependant manner on various cancer cell lines tested, but not in HMEC normal control cells. Annexin V-FITC/PI flow cytometric analysis, PARP cleavage and DNA fragmentation assays confirmed the occurrence of cell death via apoptosis. The phenyl propanoids were found to inhibit NF- κ B activation through dephosphorylation of its IKK complex, leading to a synergistic chemosensitization of cancer cells towards other chemotherapeutic drugs.

CONCLUSION

It was concluded these natural compounds isolated from the Malaysian flora represents potential chemotherapeutic targets against various malignancies.

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