

Caspase-dependent pathway in apoptosis induced by Safranal in alveolar human lung cancer cell line

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Background and Aims: Most lung cancer patients resist against conventional chemotherapy and suffer from its side effects. Thus, identification of a novel anticancer drug is urgently needed. Saffron has been shown to exhibit good antioxidant and anticancer activity. However, relatively little is known about the potential benefits of its active constituent, safranal.

Methods: A549 Cells were incubated with different concentrations of safranal, then, cell morphological changes, cell growth and apoptosis were determined by the normal invert- microscope, MTT assay, Annexin V and propidium iodide, and flow cytometric analysis, respectively. Activated caspases were detected by treatment of safranal in the lung cancer cells using fluorescein –labelled inhibitors of poly-caspases.

Results: The proliferation of A549 cells were decreased after treatment with safranal in a dose-and time-dependent manner. The results indicated that safranal induced morphological changes, decreased percentage of growth and induced apoptosis dose-and time-dependently. Safranal could induce apoptosis in A549 cells and activate caspases system. The levels of caspases involved in safranal-induced apoptosis in the A549 cell line indicating caspase-dependent pathway was induced by safranal.

Conclusions: Safranal exerts anti-proliferative effects on the human lung adenocarcinoma A549 cells. The anticancer activity of safranal could be attributed partly to its inhibition of the cell proliferation and induction of apoptosis in cancer cells through caspase-dependent pathways activation.

Keywords: Caspases; Apoptosis; Safranal; Lung; Cancer