

Role of caspases and Bax protein in saffron-induced apoptosis in MCF-7 cells

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Abstract

Saffron (*Crocus sativus*), widely used as a spice in Middle Eastern cuisine and is known for anti-cancer properties. The mechanism of saffron-induced cytotoxicity, in tumor cells has not been adequately explored. Therefore, we investigated the role of caspases and Bax protein in saffron-induced apoptosis in MCF-7 cells, a commonly used cell culture system for in vitro studies on breast cancer. Cells were incubated with different concentrations of saffron extract. Cell viability was quantitated by MTT assay. Apoptotic cells were determined using PI staining of DNA fragmentation by flow cytometry (sub-G₁ peak). Role of caspase were studied using the pan-caspase inhibitor. Bax protein expression was analysed by western blotting. Saffron extract (200–2000 µg/ml) decreased cell viability in MCF-7 cells as a concentration- and time-dependent manner with an IC₅₀ of 400 ± 18.0 µg/ml after 24 h. Analysis of DNA fragmentation by flow cytometry showed apoptotic cell death in MCF-7 cell treated with saffron extract. Saffron-induced apoptosis could be inhibited by pan-caspase inhibitors, indicating caspase-dependent pathway was induced by saffron in MCF-7 cells. Bax protein expression was also increased in saffron-treated cells. Thus saffron exerts proapoptotic effects in a breast cancer-derived cell line and could be considered as a potential chemotherapeutic agent in breast cancer. © 2009 Elsevier Ltd. All rights reserved.

Reaxys Database Information

Author keywords

Apoptosis; Bax protein; Caspase; *Crocus sativus*; Saffron

Indexed Keywords

EMTREE drug terms: 2,2-dimethyl-1,3-thiazolyl) 2,2-diphenyltetrazolium bromide; caspase; caspase inhibitor; DNA; plant medicinal product; propidium iodide; protein Bax; saffron; unclassified drug

EMTREE medical terms: animal cell; antineoplastic activity; apoptosis; article; breast cancer; cancer cell culture; cell strain MCF-7; cell viability; concentration response; controlled study; *Crocus*; DNA determination; DNA fragmentation; flow cytometry; human; human cell; IC₅₀; in vitro study; mouse; nonhuman; protein expression; signal transduction; Western blotting

MeSH: Apoptosis; bcl-2-Associated X Protein; Blotting, Western; Caspases; Cell Line, Tumor; Cell Survival; *Crocus*; DNA Fragmentation; Female; Flow Cytometry; Humans; Indicators and Reagents; Plant Extracts; Tetrazolium Salts; Thiazoles

Medline is the source for the MeSH terms of this document.

Species Index: *Crocus sativus*