

عنوان مقاله:

Chitosan extracted from the Persian Gulf chiton shells: Induction of apoptosis in liver cancer cell line

محل انتشار:

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خلاصه مقاله:

Here for the first time, we investigated the cytotoxic effects of the chitosan extracted from the Persian Gulf Chiton shell (*Acanthopleura vaillantii*) on liver cancer cell line (HepG2). Chitosan extraction was implemented following this method: chitin was produced by demineralization and deproteinization procedure, and the extracted chitin was converted into soluble chitosan using deacetylation method. The cytotoxic effects of extracted chitosan were evaluated using four different tests, including ۳-(۴,۵-dimethylthiazol-۲-yl)-۲,۵-diphenyltetrazolium bromide (MTT) assay, Annexin V-FITC, propidium iodide (PI) staining, ۴',۶-diamidino-۲-phenylindole (DAPI) staining, and Caspase activity analysis. The IC₅₀ inhibitory concentrations of chitosan were obtained at ۲۵۰ µg/mL after ۲۴ h. Chitosan clearly inhibited the growth of hepatocarcinoma cells in vitro in a dose-dependent manner. For detecting the induced cell apoptosis, HepG2 cells were treated with ۱۲۵, ۲۵۰ and ۵۰۰ µg/ml of chitosan for ۲۴ h. According to the result of Annex in V/PI kit, in ۱۲۵, ۲۵۰, and ۵۰۰ µg/ml of chitosan, ۲۸.۲, ۴۹.۱, and ۸۳.۳% of HepG2 cells undergone late apoptosis, respectively. The morphology of treated cells by DAPI staining showed non uniform plasma membrane and DNA fragmentation compared to untreated cells with perfect nucleus. The analysis of cell cycle using flow cytometry demonstrated that the rate of sub-G₁ peak was increased to ۵۲.۷%. Both caspase-۳ and -۹ activities increased by the extracted chitosan, but it was only significant for caspase-۳. The results of the present study suggested that the extracted chitosan has efficient cytotoxicity on HepG2 cells. Therefore, the extracted chitosan from the shell of the Chiton may be considered ..as a futuristic natural product regarding the treatment of liver cancer

کلمات کلیدی:

Chiton, Chitosan, Persian Gulf, Natural product, Apoptosis

لینک ثابت مقاله در پایگاه سیویلیکا:

