

THE ISOFLAVONE GENISTEIN-8-C-GLUCOSIDE INDUCES APOPTOSIS IN CHINESE HAMSTER OVARY CELLS

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Flavonoids are a group of polyphenolic compounds, diverse in the chemical structure and properties, commonly found in plants. The antioxidant activity of flavonoids is connected, at least in part, with their antimutagenic, antiatherosclerotic and anticancerogenic properties, which explains a tremendous interest in using them in medicine and disease control.

The aim of this study was to investigate the effects of glycosylated genistein on cultured immortalized Chinese hamster ovary cells (line CHO). In the current study we used genistein-8-C-glucoside (G8CG) isolated from flowers of lupine (*Lupinus luteus L.*). A lot of authors demonstrate that the action of genistein is not so simple. In numerous reports of studies conducted *in vitro*, no-glycosylated derivatives of genistein have demonstrated many apoptotic manifestations, such as reduction of mitochondrial membrane potential, release of cytochrome c to cytosol, translocation of apoptosis-inducing factor to nucleus, activation of caspase-3, nuclear condensation or generation of DNA fragmentation. Therefore, the cytotoxic and apoptotic effect of glycosylated genistein (G8CG) was examined. The Calcein AM/propidium iodide assay was used to assess cytotoxicity and Hoechst 33258/ propidium iodide staining technique was employed for the induction of apoptotic and necrotic cell death. Mitochondrial membrane potential changes ($\Delta\psi_m$), in G8CG-treated cells, were monitored using fluorescence probe JC-1 by fluorescent microscopy and flow cytometry. The cells were exposed to various concentrations of genistein-8-C-glucoside in the range of 1–90 μM . Genistein-8-C-glucoside in concentrations of 20 μM and higher induces the reduction of fraction of viable cells, loss of membrane potential and apoptotic process. In contrast to the observed effects of high doses of G8CG, low concentrations (5, 10 and 15 μM) did not demonstrate a cytotoxic activity. In conclusion, our preliminary *in vitro* studies showed that genistein-8-C-glucoside could behave as a strong toxic agent.