Abstract Title

β-elemene Induces Caspase-dependent Apoptosis in Human Glioma Cells in vitro through the Upregulation of Bax and Fas/FasL and Downregulation of Bcl-2

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BACKGROUND: β-elemene, extracted from herb medicine Curcuma wenyujin has potent anti-tumor effects in various cancer cell lines. However, the activity of β-elemene against glioma cells remains unclear. In the present study, we assessed effects of β-elemene on human glioma cells and explored the underlying mechanism.
HYPOTHESIS:We hypothesis that β-elemene could inhibit growth and induce apoptosis of human glioma cells in vitro. The induction of apoptosis appears to be related with the upregulation of Fas/FasL and Bax, activation of caspase-3,-8 and -9 and downregulation of Bcl-2, which then trigger major apoptotic cascades.
METHODS: Human glioma U87 cells were used. Cell proliferation was determined with MTT assay and colony formation assay to detect the effect of β-elemene at different doses and times. Fluorescence microscopy was used to observe cell apoptosis with Hoechst 33258 staining and change of glioma apoptosis and cell cycling were analyzed by flow cytometry. Real-time quantitative PCR and Western-blotting assay were performed to investigated the influence of β-elemene on expression levels of Fas/FasL, caspase-3, Bcl-2 and Bax. The experiment was divided into two groups: the blank control group and β-elemne treatment group.
RESULTS: With increase in the concentration of β-elemene, cytotoxic effects were enhanced in the glioma cell line and the concentration of inhibited cell viability (IC50) was 48.5 μg/mL for 24h. β-elemene could induce cell cycle arrest in the G0/G1 phase. With Hoechst 33258 staining, apoptotic nuclear morphological changes were observed. Activation of caspase-3,-8 and -9 was increased and the pro-apoptotic factors Fas/FasL and Bax were upregulated, while the anti-apoptotic Bcl-2 was downregulated after treatment with β-elemene at both mRNA and protein levels.Furthermore, proliferation and colony formation by U87 cells were inhibited by β-elemene in a time and doesdependent manner.