



## Increased Cytotoxicity of Doxorubicin in HT20 Colon Cancer Cells by Combination with 7-geranyloxy coumarin

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### Abstract

Cancer is known as one of the most challenging diseases in management and therapy, especially in developing countries. In Iran, for instance, high mortality of colon carcinoma is mainly due to their poor diagnosis and inefficacy of current therapeutic strategies. doxorubicin is a anticancer agent commonly prescribed for colon carcinoma. To investigate whether natural compounds such as coumarins could enhance the efficacy of chemical drugs, the synergic effects of 7-geranyloxy coumarin has been examined in present study *in vitro*. In this regard, 7-geranyloxy coumarin was synthesized by a reaction between 7-hydroxy coumarin and transgeranyl bromide in acetone at room temperature and then purified by column chromatography. Afterwards, HT-29 cells, a colon carcinoma cell line, were treated with increasing concentrations of 7-geranyloxy coumarin and doxorubicin, and their viability was assessed by MTT test. After determining the IC<sub>50</sub> of 7-geranyloxy coumarin and doxorubicin, HT-29 cells were treated with combining concentrations, including 20 µg/ml 7-geranyloxy coumarin with 1, 2 and 4 µg/ml doxorubicine. Then, effect of each combination was assessed on cells' morphology and viability after 24, 48, 72 h. After cell treatments, the IC<sub>50</sub> of 7-geranyloxy coumarin and doxorubicin were determined as >40 µg/ml and >9 µg/ml in HT-29 cells, respectively. Studying HT-29 cells treated with combining concentrations revealed that combination of 20 µg/ml 7-geranyloxy coumarin with 1 µg/ml doxorubicin increased the toxicity of doxorubicin up to 14.5%. As 7-geranyloxy coumarin enhances the cytotoxicity of doxorubicin, it is worth to study its synergic effects on other anticancer drugs.

**Key words:** Doxorubicin, 7-geranyloxy coumarin, HT-29 cells, Cytotoxicity