The expression of $P21$ in esophageal carcinoma cells was enhanced by combination of 7-geranyloxycoumarin and paclitaxel

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Abstract:

Introduction: The mortality rate of cancer is growing worldwide, mainly due to the poor diagnosis and inefficacy of current therapeutic modalities such as chemotherapy. 7-geranyloxycoumarin, also known as auraptene, is a natural coumarin derivative with various biological properties. In present study, we investigated 7-geranyloxycoumarin effects on the cytotoxicity of a common anticancer agent, paclitaxel, which induced $P21$-dependent apoptosis.

Methods: To determine 7-geranyloxycoumarin effects on paclitaxel activity, esophageal carcinoma cells (KYSE30 cell line) were treated with non-toxic concentration of 7-geranyloxycoumarin (20 µg/ml) and 1 µg/ml paclitaxel, for 72 h. In addition, cells treated with DMSO and 1 µg/ml paclitaxel for 72 h were considered as control group. After the total RNAs were extracted and cDNAs were synthesized, real-time RT-PCR was performed using SYBR green master mix. To note, PCR efficiencies were calculated for $P21$ primers and GAPDH transcripts were used as internal control.

Results: Analyzing results of real time RT-PCR revealed that incubation of cells with DMSO and 1 µg/ml paclitaxel increased the expression of $P21$ up to 13.83 ± 3.36. However, treating cells with combination of 7-geranyloxycoumarin (20 µg/ml) and 1 µg/ml paclitaxel significantly changed the expression of $P21$ to 58.57 ± 7.34. Accordingly, it seems that non-toxic concertation of 7-geranyloxycoumarin induced positive regulatory effects on the expression of our candidate in esophageal carcinoma cells. This is in line with our previous work, which revealed that 7-geranyloxycoumarin reduced malignant properties of KYSE30 cells. In conclusion, we recommend studying 7-geranyloxycoumarin activity, as an effective anticancer agent, on other gastrointestinal cancer cell lines.

Keywords: 7-geranyloxycoumarin-Paclitaxel- $P21$