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Abstract

Cytotoxic Effects of Coumarin Compounds Imperatorin and Osthole, Alone and in Combination with 5-Fluorouracil in Colon Carcinoma Cells †

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Abstract: Colon cancer is one of the causes of cancer-related mortality. So, more efficient therapy strategies are needed. There is an increasing interest in natural products due to their potential cytotoxic activity in various cancer cell lines. Osthole and imperatorin are major active coumarins found in a variety of plants. The aim of the present study was to assess the cytotoxic effects of osthole and imperatorin administered separately and in combination with 5-fluorouracil (5-FU) in human colon carcinoma cells and to identify the action of mechanism. Therefore, Colo205 cells were treated with imperatorin (200 μM), osthole (400 μM), and 5-FU (64 μM) 24 h after cell seeding. Real-time cell analysis by xCELLigence System was used to continuously monitor the cell proliferation and viability on Colo205 cells. Furthermore, the effects of the compound on p38 MAPK acitivity and Akt mRNA levels were evaluated. As a result, osthole showed considerable anti-proliferative activity in Colo205 cells and increased the efficacy of 5-FU by accelerating the cytotoxic effect and decreasing the Akt mRNA levels and inhibiting the p38 MAPK activity. Additionally, it was observed that osthole was more effective than imperatorin inhibiting cell proliferation. The findings indicate that osthole may be a promising anti-cancer agent in the treatment of colon cancer.

Keywords: imperatorin; osthole; 5-fluorouracil; cytotoxicity; xCELLigence

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