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Effects of newly synthesized indoline-2-thione derivatives on cell growth, apoptosis and MMP-9 expression of MCF-7 cells

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Matrix Metalloproteinases (MMPs), have long been considered as potential biomarkers in many types and stages of cancer. MMP-9 (gelatinase B), plays important role on extracellular matrix degradation and cell migration and it's overexpressed in breast cancer resulting with tumor invasion. On the basis of the pivotal roles of MMPs, the pharmaceutical industry has been investigating potent MMP inhibitors for several years and some indole derivatives are known to have inhibitory effects on MMPs. The aim of this study is to evaluate the effects of newly synthesized indoline-2-thione derivatives on proliferation, apoptosis and MMP-9 mRNA expression of human MCF-7 breast adenocarcinoma cells. In this context, the effects of newly synthesized 3-(Substitue-benzylidene)-1,3-dihydro-indoline-2-thione derivatives [compounds 1-3] on cell growth, proliferation and apoptosis of human MCF-7 breast carcinoma cells were evaluated. Quantitative real-time reverse transcription PCR was performed to quantify the mRNA expression of MMP-9. The compounds [1-3] significantly inhibited cell growth with IC values of 0.296, 1.179 and 1.771 μM , respectively. Although the BrdU-treated cells demonstrated a statistically significant dose-responsive decrease in cell numbers for all compounds, compound [3] was the most potent anti-proliferative agent that the proliferating cell amount decreased to 38.40% when compared with control. The results also showed that compound [3] inhibited the expression of MMP-9 protein even at 10 μM concentration. In conclusion, the newly synthesized indole derivatives inhibited cell growth and proliferation of MCF-7 cells significantly. The results also showed that these compounds display their cytotoxic effects through inhibition of MMP-9 mRNA expression.

Biography

Filiz Bakar has completed her PhD at Ankara University School of Pharmacy, Department of Biochemistry in 2012 and she is working at the same department as Associate Professor since 2014. She has published more than 15 papers in reputed journals. Her research areas are mainly related to coagulation events in diabetes, cancer-diabetes relations, cell culture experiments, and combination drug therapies on cancer cells.

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