Cytotoxic Effect of Pterostilbene, a Resveratrol Derivative, on Cancer Cells

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Pterostilbene, a dimethyl ester derivative of resveratrol, is a bioactive food compound that mediates many cellular targets involved in cancer signaling pathways. The p53 tumor suppressor protein plays an essential role in preventing cancer development by inducing cell cycle arrest or apoptosis in response to cellular stress. This protein has been suggested to have a role in the anticancer properties of resveratrol and its structural analogues. Thus, the present study was aimed to check the cytotoxic and pro-apoptotic effects of pterostilbene on MCF-7 cells, a p53-positive human breast cancer cell line. MTT reduction cell viability assay showed that pterostilbene (10–200 µM) promoted a cytotoxic effect on MCF-7 cells in a dose- and time-dependent manner. In a concentration of 50 µM, this compound was able to impair approximately 30% and 75% of cell viability after 24 and 48h of treatment, respectively. These effects were more pronounced than those induced by resveratrol in MCF-7, at the same experimental conditions. Furthermore, cell treatment with 100 µM of pterostilbene for 24h increased the exposition of phosphatidylinerine on cell surface, which is suggestive of apoptosis. This effect was partially prevented when cells were pretreated with pifithrin-α, a specific p53 inhibitor. Taken together, our results indicate that pterostilbene can be suggested as a promising chemopreventive agent and the cytotoxicity promoted by this compound in tumor cells possibly requires p53 function.

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