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Bacterial MazF mediated apoptosis in colorectal adenocarcinoma HT29 cells

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Programmed cell death (PCD), an active process that leads to cell suicide, is a critical mechanism in eukaryotes and prokaryotes. In bacteria, MazEF is the best studied bacterial PCD system. This system includes a ribonuclease, called MazF, that cleaves mRNAs at ACA sequences leading to inhibition of protein synthesis. This protein is also able to induce Bak-dependent apoptosis in mammalian cells. Colorectal cancer is the second cause of cancer related mortality in the United States. In the present study, the ACA-less *mazF* gene was inserted into pSF-T7-EMCV T7 IRES expression plasmid. The mRNAs of *mazF* gene were synthesised *in vitro* condition and 1 µg/ml of the mRNA was transferred into HT29 (Colorectal adenocarcinoma) cell lines. The incidence of apoptosis was detected by conducting TUNEL and Annexin-V assays. The results showed that only 26% of cells when treated with 1 µg/ml of mRNA remained attached and 32% out of the attached cells were either in early or late stages of apoptosis after 48 hours. The results suggest that MazF protein could be a suitable apoptotic inducer against cancer cells. Since this protein is able to cleave mRNAs at ACA sites, it could find various targets such as XIAP mRNA in cancer cells for effective control of cancer proliferation. This finding is the first report of the application of MazF as an anti-cancer agent for the induction of apoptosis in HT29 cell lines.

Biography

Maryam Saffarian started working as a faculty member at Shahid Chamran University, Iran at the age of 23. She is a PhD student at Clemson University. She has published a book and 5 papers in reputed journals.

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