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Apoptotic effects of ectoine and hydroxyectoine on human lung cancer cells

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Background: Streptomyces cope with osmotic stress by accumulating or *de novo* synthesizing of low molecular weight, highly water-soluble organic solutes, so-called compatible solutes or osmolytes. Ectoine, 1,4,5,6-tetrahydro-2-methyl-4-pyrimidine carboxylic acid and its hydroxylated derivative, 5-hydroxyectoine are two of the most commonly found osmolytes in Streptomyces. They typically are synthesized in response to increases in environmental osmolarity. But there are a few documents to demonstrate potential of prevention or therapy of diseases by these group of substances. In this new research, we investigated antiproliferative action of two compatible solute Ectoine and 5-Hydroxy ectoine on a human lung cancer cell line (QU-DB).

Methods: QU-DB was treated by five doses of ectoine and also hydroxyectoine at 48 h and cytotoxicity effects of these compatible solutes on cultured cell line were demonstrated by MTT assay. Finally, nuclear morphology of cells was monitored by DAPI fluorescent staining method.

Results: It has been demonstrated that not only ectoine, but also hydroxyectoine inhibited the proliferation of QU-DB in a dose-dependent fashion and both of them had cytotoxic effects on cancer cell line and induced apoptosis in them at concentration ranging between 2 mM to 10 mM.

Conclusion: Because compatible solutes are compliant natural products without documented toxic potential, we propose that this group of substances may be used for the treatment of lung cancer in humans instead of traditional chemotherapy.

Biography

Mojhgan Sheikhpour has completed his PhD at the age of 35 years from Tarbiat Modares University Faculty of Biological Sciences. She is teaching and investigating in Tehran university in Iran and has published papers in reputed journals.

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