

4th World Congress on

Cancer Science & Therapy

October 20-22, 2014 DoubleTree by Hilton Hotel Chicago-North Shore Conference Center, USA

Preparation of sulfur nanoparticles and investigating their activities against cancer cells

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Sulfur is an important element has many practical applications in present as nanoparticles. Nanosize sulfur particles also have many important applications like in pharmaceuticals, medicine, synthesis of nano-composites for lithium batteries, modification of carbon nano tubes. Different methods were used for nano-sized particle synthesis; among those, chemical precipitation, electrochemical method, micro emulsion technique, composing of oil, surfactant, co-surfactant, aqueous phases with the specific compositions and ultrasonic treatment of sulfur-cystine solution. In this work Sulfur nanoparticles (SNPs) were prepared by a quick precipitation method with and without using a surfactant to stabilize the formed SNPs. The synthesized SNPs were characterized by XRD, SEM and TEM in order to confirm their sizes and structures.

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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 organicsolutes, 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 48h 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 Tarbiatmodaress University Faculty of Biological Sciences. She is teaches and investigates in Tehran university in Iran and has published papers in reputed journals.

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