CYTOTOXICITY OF ZNO NANOPARTICLES ON HUMAN PULMONARY ADENOCARCINOMA CELL LINE LTEP-A-2

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Abstract: Since novel nanoparticles (NPs) have been produced and applied in our daily lives at a rapid pace, the cytotoxicity of NPs should be evaluated during risk assessments. The aim of this study was to investigate the cytotoxicity of ZnONPs on human pulmonary adenocarcinoma cells LTEP-a-2. The physicochemical properties of the ZnONPs in buffer were characterized according to methods. Cell proliferation was determined using tetrazolium salt colorimetric (MTT) assay. Morphological changes induced by ZnONPs were observed by scanning electron microscopy (SEM). In addition, active oxygen tests, lactose dehydrogenase (LDH) release assay and cell apoptosis detection experiments were applied to illustrate the mechanisms of cytotoxicity. The results demonstrated that ZnONPs solutions that range in concentration from 0 μg/ml to 1.5 μg/ml could significantly inhibit the growth of LTEP-a-2 cell after treatment for 4 h, 8 h and 12 h. And thereafter, ZnONPs were found to increase intracellular reactive oxygen species (ROS) and induce the formation of apoptotic vesicles and cell nuclei lysis. Taken together our results suggested that ZnONPs could execute its cytotoxicity to cells by acting as an apoptosis inducer to suppress the proliferation of LTEP-a-2 cells in vitro.

Keywords: LTEP-a-2, ZnO nanoparticles, cytotoxicity, mechanism

Acknowledgements: Fundings for this research was provided by the Hundred Talents Program of Chinese Academy of Sciences and Yantai Science and Technology Project (No. 2012017).