

Tetrandrine induced apoptosis and autophagy in human oral cancer hsc-3 cells through reactive oxygen species (ROS) production, endoplasmic reticulum stress and ERK/NF-Kb signaling pathways

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Tetrandrine, an efflux pump inhibitor, is a bisbenzylisoquinoline alkaloid isolated from *Stephania tetrandrae* (a Chinese medicinal herb), has biological activity including antitumor activity. Numerous evidences have been shown that tetrandrine induced apoptosis in many human cancer cell lines. However, there is no available information to show tetrandrine induced apoptosis and autophagy in human oral cancer HSC-3 cells. Herein, we investigated the cytotoxic effects of tetrandrine on HSC-3 cells *in vitro*. Flow cytometer was used for measuring the percentage of viable cells, cell cycle distribution, apoptosis, reactive oxygen species (ROS) production and the levels of mitochondrial membrane potential. Electromicroscope was used to confirm tetrandrine induced autophagy in HSC-3 cells. Results indicated that tetrandrine decreased the percentage of viable cells, promoted the production of intracellular ROS, and treatment with ROS scavengers (NAC) significantly abrogated the tetrandrine-induced autophagy and apoptosis. We also found that tetrandrine-induced mitochondrial dysfunctions may resulted in ROS accumulation and autophagy. These observations suggesting that the generation of ROS plays an important role in promoting tetrandrine-induced autophagy in HSC-3 cells. Furthermore, tetrandrine inhibited expression of phosphorylated ERK, phosphorylated IKK, promoted the degradation of I κ B α and then led to reduce the DNA-binding activity of NF- κ B. Thus, tetrandrine induced cell death also through the down-regulated ERK/NF- κ B signaling. Based on these findings, we also suggesting tetrandrine induced autophagy in HSC-3 cells also through the inhibition of ERK/NF- κ B signaling

Biography

Jing-Gung Chung has completed his Ph.D at the age of 36 years from University of Mississippi Medical School and postdoctoral studies from University of Michigan. He is the chairman of Department of Biological Science and Technology, China Medical University, Taichung 404, Taiwan, R.O.C. He has published more than 250 papers in reputed journals and serving as an editorial board member of International Journal of Oncology, Anticancer research

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