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Cantharidin induces cell death of NCI-H460 human lung cancer cells through caspase-and mitochondria-dependent signal pathways

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Lung cancer is the major caused cancer death in Taiwan. However, the treatment of human lung cancer is still unsatisfactory. Cantharidin was isolated from blister beetle and have been used as a traditional Chinese medicine and it has been reported to have biological activity such as anticancer, antibiotic, antivirus and immune-regulated functions. However, there is no available information to show cantharidin induced cell death in NCI-H460 human lung cancer cells, thus, in the present study, we investigated the effects of cell death by cantharidin on NCI-H460 human lung cancer cells *in vitro*. Contrast phase microscopy, confocal laser system microscope, FACScan, Annexin V-FITC staining and DNA gel electrophoresis were performed for examining apoptosis in NCI-H460 cells after treatment with cantharidin. The expression of proteins which is associated with apoptosis in NCI-H460 cells was examined by Western blot. The results showed that cantharidin induce inhibitory action on proliferation of NCI-H460 human lung cancer cells, inducing induced cell cycle arrest and sub-G1 phase (apoptosis) that were assayed by flow cytometer. In addition, the results also showed cantharidin promoted caspase-3, -8 and -9 activations, increase C^{2+} release but decreased the levels of mitochondria membrane potentials and reactive oxygen species production in NCI-H460 cells. Furthermore, Western blotting also showed that cantharidin promoted the pro-apoptotic protein Bak levels and inhibited the anti-apoptotic protein Bcl-2 levels, and it also increased the ratio of Bak/Bcl-2 that led to the mitochondria dysfunction for cytochrome c, AIF and Endo G release from mitochondria then to cause apoptosis. In conclusion, cantharidin induced apoptosis in NCI-H460 cells through the caspase-dependent and independent -pathway or mitochondria-dependent and -independent pathway in NCI-H460 cells *in vitro*.

Biography

Te-Chun Hsia graduated from School of Chinese Medicine, China Medical University, Taichung, Taiwan. Presently, he is a Ph.D. student at School of Chinese Medicine China Medical University, Taichung, Taiwan, R.O.C. He is focused on active compounds from traditional Chinese medicine (TCM) for targeting on human lung cancer. He also joined medical associations and have been published more than 50 papers in reputed journals.

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