

Bufalin induce cell cycle arrest and apoptotic cell death via caspase-independent signaling pathway in SCC-4 human oral cancer cells

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Bufalin is one of the active ingredient extracted from Chan Su. Bufalin exhibit a variety of biological activities such as cardiotonic anesthetic, blood pressure stimulation and antineoplastic activities. Studies confirmed that bufalin induced apoptosis of many human cancer cells including leukemia, prostate and lung cancers. They have been shown bufalin can induce a wide spectrum of cancer cell apoptosis. However, the detailed molecular mechanisms of inducing apoptosis in human oral cancer are still unclear. Our study investigated bufalin induced apoptosis of human oral cancer SCC-4 cells. At first, we determined cell viability and cell cycle distribution of SCC-4 cells after exposed to various doses of bufalin by flow cytometry analysis and the impact of cell morphology which were examined by phase-contact microscope. Our results showed that bufalin decreased cell viability in a dose-dependent manner. Bufalin induced DNA damage and DNA breakage of SCC-4 cells which were checked with the DAPI staining and DNA electrophoresis assays. Our results also showed that bufalin induced apoptosis through decreased levels of the mitochondrial membrane potential ($\Delta \Psi m$) in SCC-4 cell. Finally, Western blot analysis is used to determine the change in protein level of mitochondrial-caspase-independent related responses in SCC-4 cells. Our study provides new insights into the molecular mechanisms of bufalin that might prove to be beneficial in oral cancer therapy.

Keywords : Bufalin, apoptosis, caspases, human oral cancer cells