



MEDICAL THERAPIES AND PHARMACOLOGY

CORDYCEPS MILITARIS INDUCE APOPTOSIS IN HUMAN MALIGNANT MELANOMA CELLS THROUGH REGULATION OF MAPKINASE SIGNALING PATHWAY

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Background: Cordyceps militaris has been widely used for herbal medicinal preparations in Asian countries to treat cancer patients. Also, the extracts of Cordyceps militaris (ECM) have been reported to have anti-cancer effects including apoptosis and anti-angiogenic capacity. They inhibited the proliferation of various cancer cells such as human lung carcinoma A549 cells, MCF-7 cells (breast cancer), NCI-H460 cells (non-small lung cancer), HCT-15 cells (colon cancer). However, there was little study about anti-tumor effects of ECM for melanoma with exact action mechanism.

Objective: We aimed to investigate that ECM can induce apoptosis in human melanoma cells and potential mechanisms.

Material and Methods: In order to confirm the anti-tumor effects of ECM in melanoma cells, human melanoma cell lines including SK-MEL-2, SK-MEL-5, SK-MEL-31, and A375SM Cell Line were treated. To identify the anti-tumor effect of ECM, cell viability test was performed with MTT assay with various concentrations of ECM. Then, the anti-tumor mechanism of ECM on melanoma cells was investigated by FACS analysis and Proteomics array.

Results: In the results, ECM-induced apoptosis was observed in all human melanoma cells and dose-dependent inhibition of tumor growth was observed in the FACS analysis. To identify the action mechanism, proteomic arrays about phosphorylation profiles of kinases were analyzed by Human apoptosis array kit and Human Phospho-MAPK Array Kit. Protein expressions of catalase, cleaved caspase-3, and Akt-2 were enhanced and expression of Survivin, CDKN1A and HSP70 were downregulated in ECM treated cells compared with normal control.





Conclusion: In conclusion, our results demonstrated that ECM might be a possible candidate of natural medicinal material to treat malignant melanoma through apoptosis and MAPK signaling pathway. In the future, it needs to investigate whether ECM has synergistic effect with immunotherapeutic agents like ipilimumab and pemrolizumab, safely.

