

P127

### Thiosulfinate from *Allium tuberosum* L. Induce Apoptosis in HT-29 Human Colon Cancer Cells

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This study was performed to elucidate the effects of thiosulfinates, major biologically active components of *Allium tuberosum* L., on the induction of apoptosis and the mechanisms in HT-29 human colon cancer cells. Thiosulfinates decreased viable cell numbers in dose- and time-dependent manners by inducing apoptosis in HT-29 cells. Apoptosis induced by thiosulfinates is associated with the activation of initiator caspase-8, and -9, and the effector caspase-3. In the present study, thiosulfinates were found to stimulate Bid cleavage, indicating that the apoptotic action of caspase-8-mediated Bid cleavage leads to the activation of caspase-9. Thiosulfinates decreased the expression of the anti-apoptotic protein Bcl-2, and increased the expression of the pro-apoptotic protein Bax. We also found that thiosulfinates increased the expression of AIF, a caspase-independent mitochondrial apoptosis factor, in HT-29 cells, and induced DNA fragmentation and chromatin condensation. These results indicate that thiosulfinates from *Allium tuberosum* L. inhibit cell proliferation and induce apoptosis in HT-29 cells, which may be mediated via both caspase-dependent and caspase-independent pathways.

**Key words:** *Allium tuberosum* L., thiosulfinates, apoptosis, HT-29

P128

### Proteome Analysis of Responses to Ascochlorin in LPS-induced Mouse Macrophage Raw 264.7 cells by 2-D Gel Electrophoresis and MALDI-TOF MS

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Ascochlorin is prenyl-phenol compound that was isolated from the fungus *Ascochyta viciae*. Ascochlorin reduces serum cholesterol and triglyceride levels, and suppresses hypertension, tumor development, ameliorates type I and II diabetes. In this study, we used a proteomic analysis of Mouse macrophage Raw 264.7 cells by ASC, to identify proteins potentially involved in inflammation processes. The Raw 264.7 cell proteomes with and without treatment with ascochlorin were compared using two-dimensional electrophoresis, matrix-assisted laser desorption/ionization mass spectrometry and bioinformatics. The largest differences in expression were observed for the Calreticulin (4-fold decrease),  $\beta$ -actin (4-fold decrease) and Vimentin (1.5-fold decrease). In addition, Rabaptin was increased 3-fold in RAW264.7 cells treated with ascochlorin.

**Key words:** Ascochlorin, macrophage RAW 264.7 cells, 2-D gel, MALDI-TOF-MS