Agaricus blazei Extract Induces Apoptosis through ROS-Dependent JNK Activation Involving the Mitochondrial Pathway and Suppression of Constitutive NF-κB in THP-1 Cells

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Agaricus blazei is widely accepted as a traditional medicinal mushroom, and it has been known to exhibit immunostimulatory and anti-cancer activity. However, the apoptotic mechanism in cancer cells is poorly understood. In this study, we have investigated whether A. blazei extract (ABE) exerts antiproliferative and apoptotic effects in human leukemic THP-1 cells. We observed that ABE-induced apoptosis is associated with the mitochondrial pathway, which is mediated by reactive oxygen species (ROS) generation and prolonged c-Jun N-terminal kinase (JNK) activation. In addition, the ABE treatment resulted in the accumulation of cytochrome c in the cytoplasm, an increase in caspase activity, and an upregulation of Bax and Bad. With those results in mind, we found that ABE decreases constitutive NF-κB activation and NF-κB-regulated gene products such as IAP-1 and -2. We concluded that ABE induces apoptosis with ROS-dependent JNK activation and constitutive activated NF-κB inhibition in THP-1 cells.