

Mushroom Research Abstract
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Dietary mushrooms reduce mitogenesis and induce apoptosis and cytotoxicity in MCF-7 human breast cancer cells

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Cancer is a leading cause of death in the U.S. Studies show that people with diets rich in fruits and vegetables have a reduced risk of cancer. Moreover, an accumulating body of evidence also suggests that consumption of dietary mushrooms, or fungi, can protect against many forms of human cancer. In this study, we tested the ability of five commonly consumed mushrooms to modulate the cancer process in MCF-7 human breast cancer cells. Hot water extracts (5% v/v) of freeze-dried maitake (MT), crimini (CRIM), portabella (PORT), king oyster (OYS), and white button (WB) mushrooms or water alone were incubated overnight with MCF7 cells. Mitogenesis, measured by BrdU incorporation, was significantly reduced by all mushrooms up to 33% with MT and OYS being the most potent. Cell number, however, did not significantly differ between groups as measured by hemacytometry. Apoptosis, measured by TUNEL, was increased significantly ($p < 0.05$) by 40% after incubation with MT and ~20% ($p > 0.05$) by other test mushrooms. MTT reduction, a mitochondrion-dependent marker of proliferation, was unchanged. Cytoplasmic LDH release significantly increased after MT and WB, but not after other test mushrooms, indicating cytotoxicity although trypan blue exclusion appeared marginally elevated (95%) compared to control cells (92%) after 24 hours. Overall, dietary mushrooms reduced mitogenesis and induced apoptosis and cytotoxicity in MCF7 cells.