Mushrooms: Powerful Immune System Modulators

Mushroom, a diverse, edible fungus (~100 species) recognized for its medicinal value since 400 B.C. currently undergoes intensive study of its health-promoting benefits. About a half dozen of these 100 species, prominently stand out for their ability to deliver a tremendous boost to your immune system.

Synergistic Effect of Mushroom Combinations:

Each mushroom species possesses a unique arsenal of anti-infective and immuno-modulating agents. These special agents include polysaccharides, glyco-proteins, ergosterols, and triterpenoids. They are precursors to the more complex compounds, β-glucans, also known as “biological response modifiers” (because of their unique side-branching patterns and ability to activate the immune system). Each individual, mushroom species contributes a variety of β-glucan molecular structures and utilizes a different pathway to modulate the immune system. Combining several species, multiplies the number of immune cell, receptor sites that may be activated.

Because mushrooms have such powerful immune-boosting effects, it isn't surprising that some mushroom species have great potential for battling cancer. Cancer cells are notorious for "hiding" from the immune system and anti-cancer drugs. New research has shown that certain mushroom extracts help immune cells or drugs better locate and identify cancer cells by "uncloaking them," thereby making immune system or anti-cancer drugs more effective to eliminate cancer cells .

Kinds of Mushrooms in ImuGuard

Caterpillar fungus: Found only in high-altitude regions of about 3800 m above sea level, in cold, grassy, alpine meadows, Caterpillar fungus has an enduring history in both traditional Chinese and Tibetan medicine. Research demonstrated that taking caterpillar fungus results in the development of resistance to fatigue and an enhanced exercise ability and endurance. It exhibits very broad biological and pharmacological actions in hepatic, renal and cardiovascular diseases. It also affects immunological disorders including cancer. The pharmacological actions of caterpillar mushroom are primarily due to bioactive polysaccharide and modified nucleosides.

Reishi: Known as Lingzhi (spirit plant) in China, and incorporated medicinally in Asia for thousands of years, reishi consists primarily of polysaccharides, triterpenoids, proteins and amino acids. One of its major active ingredients, ganoderic acid, is used to treat lung cancer *(Life Sci. 2006 Dec 23;80(3):205-11. Epub 2006 Sep 6),* leukemia and other cancers.

Shiitake: A popular culinary mushroom world-wide, contains a number of compounds having the natural ability to reduce inflammation, tumors, harmful bacteria, viruses and fungus. The most important compound, Lentinan, a polysaccharide possesses cancer-preventing properties. One study showed slower smaller tumor development after oral treatment with lentinan *(J Altern Complement Med. 2002 Oct;8(5):581-9)*. A reduction in the negative effects in the progression of HIV and ability of leukemia cells to proliferate *(Life Sci. 2003 Nov 14;73(26):3363-74)*.

Maitake: Maitake, also known as ”the hen of the woods”, is a large mushroom native to Japan, North America and Europe. Scientific study shows that Maitake extract may have potential benefits for cholesterol and blood sugar levels, immune function, cancer treatment and prevention, and relieve certain cancer treatment side effects.

Maitake exerts its immune benefits by binding to the cell membrane of white blood cells such as macrophages and modulating cytokine release to activate the immune response.

Turkey Tail: Known as the “cloud mushroom", Turkey Tail contains two protein-bound polysaccharide complexes, PSK and PSP, currently undergoing extensive research with large scale clinical trials. A seven-year, $2 million NIH-funded clinical study in 2011 found that Turkey Tail improves immune function in a dose-dependent manner for women with stage I–III breast cancer with no adverse effects. In addition to breast cancer, Turkey Tail has been found to hold promise for other cancers, including stomach, colorectal, lung, esophageal, nasopharyngeal, cervical, and uterine. Turkey Tail has also been shown to significantly enhance immune status in 70 to 97 percent of cancer patients *(Altern Med Rev. 2000 Feb;5(1):4-27).*

Mechanisms of Anti-tumor effects from Mushrooms

Caterpillar fungus

- Decreases inflammatory factors including NF-κB and TNF-α
- Activation immune response to help early cancer cell detection by the immune system

Am J Chin Med, 1998. 26(2): 159 ~ 170

Reishi

- Directly toxic to cancer cells; inhibits tumor induced angiogenesis; cancer cell proliferation and invasive metastasis
- Activation of the immune response by increasing levels of cytokines IL-1, IL-2, IL-6, and TLR4

Recent Pat Anticancer Drug Discov. 2013 Sep;8(3):255-87

Shiitake

Inhibits inflammatory cytokine IL-1 synthesis.

- Activates the complement immune system by increasing NK cell,
- macrophage, and T cell activity.

Anti-Cancer Agents in Medicinal Chemistry. 2013;13:681-8

Maitake

- Maitake (D-fraction) extracts can induce NK cell and toxic T cell activity and increase cytokines IL-1, IL-2, leading to inflammation to activate the immune response to inhibit cancer cell proliferation and metastasis.

Altern Med Rev. 2001;6(1):48-60
American Cancer Society. 2002; July 23

Turkey Tail

- Activates immune system modulation by balancing Th1 and Th2
- Significantly extends survival rate to five years or beyond in stomach, colorectal, esophageal, nasopharyngeal, and non-small cell–lung, forms of cancer

Kidd PM. Altern Med Rev 2000 Feb; 5(1): 4-27.