



How Lingzhi Combats Aging

By Emily Steiner

Over the past several decades, scientific research has intensified and focused on analyzing the hundreds of unique bio-active compounds found in the medicinal Lingzhi Mushroom. Just this year alone, three new compounds were discovered. With each new finding, intriguing medical applications for Lingzhi have emerged.

There is now a wealth of impressive data that demonstrates Lingzhi's life extending¹ properties,² but also its significant ability to stimulate brain neurons³ search and destroy cancer cells⁴ and prevent the development of new fat cells in obese individuals.⁵ As an example of growing science supporting Lingzhi, researchers using laboratory mice have detailed life span extension of 9% to more than 20% —the equivalent of seven to nearly sixteen years in human terms.^{6 7}

As if these targeted benefits were not sufficient, Lingzhi's numerous compounds show a therapeutic effect on asthma,⁸ allergies,⁹ autoimmune diseases,^{10 11 12 13 14 15} Alzheimer's¹⁶ and Parkinson's diseases, I diabetes,^{17 18 19 20 21 22} pancreatic issues^{23 24 25 26}, liver disease,^{27 28 29 30 31 32 33 34 35 36}and more.

Given Lingzhi's complex composition of bioactive compounds, there is still more to discover. In this report, we will bring you up to date on how Lingzhi successfully targets a broad spectrum of deleterious factors of aging.

Multiple Components in Lingzhi Target Aging Mechanisms

Lingzhi mushrooms have been used for medicinal purposes for at least 2,000 years.³⁷ The mushrooms were known to the ancients as "the mushroom of immortality"³⁷—and for good reason. They had the reputation of promoting health and longevity, boosting the immune system, and reducing the risk of life-shortening conditions such as cardiovascular disease and cancer.^{38 39 40 41} Science has finally validated this traditional wisdom.

Originally, Lingzhi mushrooms were rare and expensive,^{38 42} but now advances in cultivation techniques have made these medicinal mushrooms more available which has led to an explosion of research on their properties and components.^{38 42}

Studies have shown that Lingzhi mushrooms can contribute to longer life spans.^{1 2} They can help manage some of today's most troubling age-related conditions, including autoimmune diseases, neurodegenerative disorders, diabetes, liver disease, cancer, and more.

How is it that this simple mushroom can have such wide-ranging health effects? Keep in mind that there isn't one single cause of aging and disease. Numerous factors contribute to these conditions—meaning that in order to combat them, you need to fight them from a multi-targeted approach. That's exactly what makes Lingzhi mushrooms so powerful. The mushroom itself contains hundreds of biologically active molecules—all of which work together to have such broad-reaching health benefits.³⁷

Researchers have identified three specific compounds that are essential to Lingzhi's powerful antioxidant and anti-aging effects:

- **Polysaccharides** have anticancer effects based on their ability to prevent abnormal blood vessel formation, and to boost immune system function.^{40 42}
- **Triterpenes** protect the liver, lower blood pressure and cholesterol, prevent platelet clumping that leads to heart attack and stroke, fight allergic responses triggered by histamine, and also possess anticancer activity.⁴²
- **Ganoderma lucidum peptide** is a unique protein that has remarkably potent antioxidant characteristics that are still being unraveled.⁴³

But what makes Lingzhi mushroom beneficial to so many varied aspects of your health is its actions on many different targets in your body. The actions triggered by Lingzhi mushrooms produce important changes that may contribute to their promotion of longevity.

Lingzhi extracts are known to:

- Protect cellular DNA from oxidant damage that causes aging and cancer.⁴⁴
- Protect mitochondrial DNA and the mitochondria themselves from oxidant damage that weakens their energy-producing abilities and makes them inefficient, another major cause of aging.^{45 46 47}
- Increase levels and activity of a large suite of natural intracellular antioxidant molecules, resulting in reduced oxidation of cell membranes and organelles that lead to aging and its related diseases.^{38 48}
- Protect kidney tubule cells from oxidant damage that leads to kidney failure.⁴⁹
- Increase expression of a key longevity gene and promote an increased life span in species ranging from yeasts, to primitive worms, to mammals such as mice.^{1 2 50 51}

Several studies have shown that Lingzhi is one of the most powerful mushrooms with regard to antioxidant characteristics.^{52 53} Lingzhi mushrooms boost total antioxidant capacity, an important measure of the vigor with which they fight oxidant damage.^{52 54}

In a human study, Lingzhi mushrooms were given to healthy volunteers as a single 1100mg dose.⁵⁴ Plasma antioxidant capacity rose rapidly to a peak at ninety minutes, while urine antioxidant capacity (a measure of what has been in the body) rose by 29% after three hours. Neither study showed any evidence of toxicity or side effects.³⁹

Lingzhi's many mechanisms of action are what allow it to have such a dramatic impact on such a wide array of age-related health threats. Let's now look at some of the most promising areas of research.

Breaking News on Lingzhi Mushrooms and Cancer Prevention

New compounds are being discovered within extracts of Lingzhi mushroom on a regular basis; at least 3 were identified in late 2012 alone.⁵⁵ These discoveries are shedding light on Lingzhi extracts' remarkable, multi-targeted anti-cancer properties.

Most intriguing are findings that add to our knowledge about Lingzhi and the phenomenon of immune surveillance. New cancer cells appear in your body every day, but your healthy immune system normally searches these out, quickly activating killer cells to destroy developing cancers before they can form tumors.

Lingzhi's many mechanisms of action are what allow it to have such a dramatic impact on such a wide array of age-related health threats.

Advancing age, coupled with the onset of other chronic illnesses, and exposure to various environmental toxins (and even some medications), means that your immune system's ability to carry out immune surveillance wanes. And, if just one abnormal, cancer-prone cell escapes detection and destruction, it can develop into a full-blown malignancy with tremendous swiftness.

Meta-analysis conducted on Lingzhi for Cancer Treatment

An evaluation of all available clinical trials on the use of Lingzhi in cancer treatment was published in June 2012.

While there was insufficient data to demonstrate efficacy Lingzhi by itself, when Lingzhi was given alongside radiation and/or chemotherapy, patients were 50% more likely to respond positively compared to those given chemo/radiation alone. The results in cancer patients receiving Lingzhi showed the expected increases in immune cells known to enhance tumor response and stimulate host immunity.⁸²

There's an abundance of data on ways that Lingzhi extracts boost immune surveillance and enhance detection and elimination of emerging cancer cells from the body.⁵⁶ And in late 2012, several new studies revealed that these mushrooms have substantially deeper and more advanced mechanisms than had been previously suspected. The mechanisms of how Lingzhi identifies and then attacks cancer cells are extremely sophisticated and effective. We know that cancer cells evade immune system surveillance by "hiding" their abnormal surface markers.⁴ These types of molecular changes not only permit primary cancer to arise, but also contribute to relapses of cancer following chemotherapy.⁵⁷

Lingzhi extracts force cancer cells to reveal their telltale markers, flagging them for destruction by immune killer cells.⁴ At the same time, Lingzhi extracts induce the production of specific molecules that the immune system needs to complete the killing process.⁴ Ultimately, Lingzhi extracts enhance the killing of cancer cells by normal

immune killer cells, and reduce the amount of chemotherapy drugs required to finish the job.^{57 58}

In addition to their impressive immune-surveillance-boosting properties, Lingzhi extracts have numerous other ways of attacking cancer:

- Lingzhi compounds, particularly the triterpenes and polysaccharides, limit tumors' growth rate by blocking the abnormal reproductive cycles of cancer cells.⁵⁹
- Some of these compounds are directly toxic to cancer cells, while sparing healthy tissue.^{60 61}
- Lingzhi compounds inhibit metastatic processes and decrease the expression of genes involved in cancer cell survival, proliferation, invasion, and metastasis.⁶¹
- Lingzhi compounds also trigger the programmed cell death called apoptosis that's suppressed in malignant cells.^{55 60 61 62}

Together, all of these effects of Lingzhi mushrooms are shown to reduce the size and growth rates of human tumors, both in animals and in human clinical trials.

The most dramatic impact has been shown in colorectal cancer, which is the second leading cause of cancer death among cancers that affect both men and women.⁶³

Clinical studies show that Lingzhi extracts suppress the development of adenomas, which are pre-malignant masses found in the large intestine.⁶⁴

Remarkable Benefits of Lingzhi

Recent studies show that Lingzhi mushrooms have hundreds of components in three distinct classes of bioactive molecules, making them ideal for combating the complex and multifactorial diseases we face with advancing age.

Together, all of these effects of Lingzhi mushrooms are shown to reduce the size and growth rates of human tumors.

Lingzhi extracts prolong life spans in animal experiments by 9 to more than 20%.

Lingzhi boosts the immune system's vigilance against cancer cells, potentially reducing the risk of developing a detectable and deadly tumor.

Lingzhi extracts can suppress an overly vigorous immune response, helping to quell symptoms of allergies, asthma, and autoimmune diseases.

Independent of their immune-modulating effects, Lingzhi mushrooms' active molecules are showing promise in the battle against neurodegenerative diseases, obesity and diabetes, and liver disease.

If there is such a thing as the "ideal" supplement, capable of attacking multiple complex diseases each with multiple causative factors, Lingzhi mushrooms are surely an outstanding candidate.

Lingzhi Balances the Immune System

Lingzhi mushrooms have a well-known ability to beneficially modulate the immune system.^{65 66 67} The mushrooms' ability to boost immunity is the source of their advanced cancer- and infection-fighting properties. But it is equally important to keep your immune system from overreacting and turning on itself, as is the case with autoimmune diseases such as allergies. Lingzhi mushrooms have demonstrated the ability to modulate the delicate balance necessary for a healthy immune system. Studies have shown that Lingzhi mushrooms can reduce the overactive immune response that occurs in conditions such as allergies, asthma, and autoimmune diseases.

The polysaccharides and triterpenes found in Lingzhi mushrooms act at multiple targets in the cascade of events leading to inflammation and excessive immune response.^{17 67 68}

Lingzhi extracts inhibit the release of histamine from specialized immune cells called "mast cells."⁶⁵ They have the ability to reduce the activity in nerves that transmit the itch sensation to the brain after a mosquito bite or similar itchy stimulus.^{69 70}

Lingzhi extracts were able to sharply reduce the symptoms associated with allergies.

In animal models, Lingzhi extracts were able to sharply reduce the symptoms associated with allergies, such as rhinitis (watery, itchy nose) and mosquito bites.⁹ Studies also show that Lingzhi extracts can reduce "airway hyper-responsiveness," the "twitchy" smooth muscle responses in the lung bronchi that trigger an asthma attack.⁸

Lingzhi extracts also show promise for the management of the underlying immune imbalance that leads to autoimmune diseases.^{10 -15}

Lingzhi Promotes Neuro-protection

Lingzhi extracts were found to stimulate the production of nerve growth factor, which in turn supports the rapid development of healthy neurons and enhances their mitochondrial function.³

Lingzhi's powerful antioxidant and anti-inflammatory properties make these mushrooms attractive candidates for preventing neurodegenerative diseases such as Alzheimer's and Parkinson's. Both of these diseases are driven by oxidative stress and inflammation.

The triterpenes and polysaccharides from the mushrooms reduce the oxidative impact of destructive proteins such as Amyloid-beta, the chief trigger of Alzheimer's disease¹⁶ and they protect brain cells from the inflammation known to cause Parkinson's disease.¹⁷⁻²¹

Studies reveal that supplementing with Lingzhi mushrooms has beneficial effects for stroke victims. First, it can limit the size of the stroke-damaged area in the brain, which helps limit behavioral and functional damage caused by the stroke.⁷¹ Second, Lingzhi mushrooms protect brain tissue from hypoxia/reperfusion injury, the "one-two" punch of oxygen starvation followed by excessive oxidation that produces most of the damage in the brains of stroke victims.¹⁹

But as valuable as these benefits are, nowhere are the effects of Lingzhi mushroom extracts more clear than in their impact on diabetes-related cognitive disorders. In animal studies, Lingzhi spores alleviated diabetes-induced oxidative stress and mitochondrial dysfunction in the hippocampus, one of the brain's chief memory-processing areas.²²

Lingzhi and *Diabetes*

Obesity is a health hazard sweeping the globe in epidemic proportions—and chief among its complications is type II diabetes. The conditions are so often found hand-in-hand that researchers refer to them as a single disease called *diabesity*—diabetes plus obesity. Lingzhi mushrooms are especially valuable in the fight against this epidemic because they've been shown to have benefits across the entire spectrum of diabetes.²³⁻²⁶

Laboratory studies show that the polysaccharides and triterpenes in Lingzhi extracts can prevent the development of new fat cells from pre-adipocytes, helping to limit excessive fat storage seen in obese people.⁵ The extracts also have favorable effects on lipid profiles (cholesterol and triglycerides), which are frequently elevated in those with obesity and/or diabetes—and are risk factors for cardiovascular disease.²³

**Diabetes—
Diabetes caused by
overweight or obesity.**

Lingzhi extracts work to lower blood sugar by several different mechanisms.^{5 23 24 72 73 74 75 76} Lingzhi inhibits alpha-glucosidase, the chief enzyme responsible for digesting starches into sugars.⁷⁷ This inhibition prevents the sharp after-meal spike in glucose that is so dangerous as we age.⁷⁸ They also limit the destruction caused by advanced glycation end products (AGEs), the proteins whose malfunction promotes aging and inflammation.⁷⁹

Studies have shown that reducing blood sugar and glycation with Lingzhi supplements reduces diabetic consequences like kidney disease.⁸⁰ Lingzhi extracts also speed wound healing in diabetic individuals, the result of enhanced antioxidant function.⁸¹

Lingzhi Safeguards Liver Function

Your liver is the direct recipient of toxic threats both from the environment and from destructive molecules produced within your body. While it is well protected with its own antioxidant and detoxification systems, oxidation and inflammation eventually take their toll, leaving the aging liver at risk for decreased function, increased accumulation of toxic injury, fibrosis, and cancer. Fortunately, Lingzhi mushrooms offer direct protection against such threats.²⁷

Studies show, for instance, that pre-treating animals with Lingzhi spores can protect them when they're exposed to cadmium, a highly toxic metal capable of causing massive liver failure.²⁸ Researchers found the spores decreased the cadmium accumulation in liver; while "pushing" the toxic metal into the liquid matrix of the cells. Once there, the mushroom spores increased the production of a cadmium-binding protein that removes the toxin from the body.²⁸

Lingzhi mushroom extracts similarly protect liver tissue from the toxic effects of certain bacterial infections. In animals with such infections, Lingzhi polysaccharides inhibit inflammation in liver cells.²⁹ Other studies reveal that

Lingzhi polysaccharides restore natural liver antioxidant systems to normal function following an infection, while inhibiting liver enzymes that produce excessive oxidative stress.^{30 31} Lingzhi mushrooms limit the activity of beta-glucuronidase, an enzyme that is elevated in many liver conditions, including inflammation, cirrhosis, and jaundice.^{31 32}

One of the most exciting potential applications for Lingzhi mushrooms in liver disease is in the condition called liver fibrosis, which is the final stage of non-alcoholic fatty liver disease. Statistics have shown that non-alcoholic fatty liver disease is the most common form of liver disease, ultimately affecting 20 to 30% of the population.³²⁻³⁵ In an animal model of toxin-induced liver fibrosis, treatment with Lingzhi extract reversed the fibrosis even after it was well-established.³⁶ This is an exceptional result, because in most cases, liver disease that has advanced to the stage of fibrosis is considered irreversible.

Lingzhi extract reversed liver fibrosis caused by liver disease, long thought to be irreversible.

Summary

Lingzhi mushrooms provide a broad-spectrum approach to the treatment and prevention of many of today's age-related diseases. With their diverse molecular makeup, they offer a broad spectrum of actions that attack aging at its root.

This is seen clearly in research demonstrating Lingzhi's ability to prolong the life spans of laboratory mice by 9% to more than 20% —the equivalent of 7 to nearly 16 years in human terms.

This is further demonstrated in research that has uncovered its powerful anti-cancer activity. Lingzhi mushrooms contribute to enhanced immune surveillance that can seek and destroy cancer cells before they can form threatening tumors.

Finally, studies have shown that Lingzhi extracts have a role in the prevention or mitigation of asthma, allergies, and autoimmune disorders, while offering protection against neuro-degeneration, obesity and diabetes, and liver diseases of many kinds.

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