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Report

How Reishi 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 **Reishi** Mushroom. Just this year alone, three new compounds were discovered. With each new finding, intriguing medical applications for **Reishi** have emerged.

There is now a wealth of impressive data that demonstrates Reishi's life extending properties^{1,2} but also its significant ability to stimulate brain neurons,³ search and destroy cancer cells⁴ and prevent the development of new fat cells in obese individuals.⁵ As an example of growing science supporting Reishi, researchers using laboratory mice have detailed life span extension of **9%** to more than **20%** —the equivalent of **7** to nearly **16** years in human terms.^{2,6,7}



As if these targeted benefits were not sufficient, Reishi's numerous compounds show a therapeutic effect on asthma,⁸ allergies,⁹ autoimmune diseases,¹⁰⁻¹⁵ Alzheimer's¹⁶ and Parkinson's diseases,¹⁷⁻²¹ diabetes,²²⁻²⁶ liver disease,²⁷⁻³⁶ and more.

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

Multiple Components Target Aging Mechanisms

Reishi 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.³⁸⁻⁴¹ Science has finally validated this traditional wisdom.

Originally, Reishi 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 Reishi 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 Reishi 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 Reishi's powerful antioxidant and antiaging effects:

1. **Polysaccharides** have anticancer effects based on their ability to prevent abnormal blood vessel formation, and to boost immune system function.^{40,42}
2. **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
3. **Ganoderma lucidum peptide** is a unique protein that has remarkably potent antioxidant characteristics that are still being unraveled.⁴³

But what makes Reishi mushroom beneficial to so many varied aspects of your health is its actions on many different targets in your body. The actions triggered by Reishi mushrooms produce important changes that may contribute to their promotion of longevity. Reishi 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.⁴⁵⁻⁴⁷
- 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 Reishi is one of the most powerful mushrooms with regard to antioxidant characteristics.^{52,53} Reishi mushrooms boost total antioxidant capacity, an important measure of the vigor with which they fight oxidant damage.^{52,54}

In a human study, Reishi mushrooms were given to healthy volunteers as a single **1,100 mg** dose.⁵⁴ Plasma antioxidant capacity rose rapidly to a peak at 90 minutes, while urine antioxidant capacity (a measure of what has been in the body) rose by **29%** after 3 hours. Neither study showed any evidence of toxicity or side effects.³⁹

Reishi'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 Reishi Mushrooms and Cancer Prevention

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

Most intriguing are findings that add to our knowledge about Reishi 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.

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.

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

While there was insufficient data to demonstrate efficacy Reishi by itself, when Reishi 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 Reishi showed the expected increases in immune cells known to enhance tumor response and stimulate host immunity.⁸²

We at Life Extension® look forward to better quality methodological trials to clarify the value of Reishi in adjunctive cancer treatment.

There's an abundance of data on ways that Reishi 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 Reishi 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

Reishi extracts force cancer cells to reveal their telltale markers, flagging them for destruction by immune killer cells.⁴ At the same time, Reishi extracts induce the production of specific molecules that the immune system needs to complete the killing process.⁴ Ultimately, Reishi 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, Reishi extracts have numerous other ways of attacking cancer:

- Reishi 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}
- Reishi compounds inhibit *metastatic* processes and decrease the expression of genes involved in cancer cell survival, proliferation, invasion, and metastasis.⁶¹
- Reishi compounds also trigger the programmed cell death called *apoptosis* that's suppressed in malignant cells.^{55,60-62}

Together, all of these effects of Reishi 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

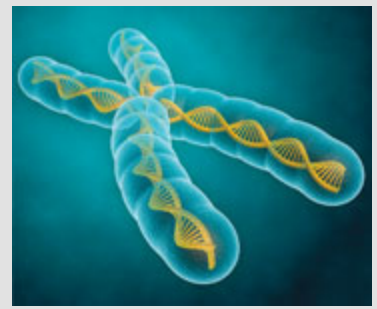
Clinical studies show that Reishi extracts suppress the development of *adenomas*, which are pre-malignant masses found in the large intestine.⁶⁴

WHAT YOU NEED TO KNOW

Remarkable Benefits of Reishi

- Recent studies show that Reishi 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.

- Reishi extracts prolong life spans in animal experiments by **9** to more than **20%**.
- Reishi boosts the immune system's vigilance against cancer cells, potentially reducing the risk of developing a detectable and deadly tumor.
- Reishi extracts can suppress an overly vigorous immune response, helping to quell symptoms of allergies, asthma, and autoimmune diseases.
- Independent of their immune-modulating effects, Reishi 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, Reishi mushrooms are surely an outstanding candidate.



Reishi Balances the Immune System



Reishi mushrooms have a well-known ability to beneficially modulate the immune system.^{11,65-67} 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. Reishi mushrooms have demonstrated the ability to modulate the delicate balance necessary for a healthy immune system. Studies have shown that Reishi mushrooms can reduce the overactive immune response that occurs in conditions such as allergies, asthma, and autoimmune diseases.

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

Reishi 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}

In animal models, Reishi 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 Reishi extracts can reduce "airway hyper-responsiveness," the "twitchy" smooth muscle responses in the lung bronchi that trigger an asthma attack.⁸

Reishi extracts also show promise for the management of the underlying immune imbalance that leads to autoimmune diseases.¹⁰⁻¹⁵

Reishi Promotes Neuroprotection

Reishi 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

Reishi'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 **Abeta**, the chief trigger of Alzheimer's disease,¹⁶ and they protect brain cells from the inflammation known to cause Parkinson's disease.¹⁷⁻²¹

Studies reveal that supplementing with Reishi 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, Reishi 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 Reishi mushroom extracts more clear than in their impact on diabetes-related cognitive disorders. In animal studies, Reishi spores alleviated diabetes-induced oxidative stress and mitochondrial dysfunction in the hippocampus, one of the brain’s chief memory-processing areas.²²

Reishi 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 “diabetes.” Reishi 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 Reishi 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

Reishi extracts work to lower blood sugar by several different mechanisms.^{5,23,24,72-76} Reishi 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 Reishi supplements reduces diabetic consequences like kidney disease.⁸⁰ Reishi extracts also speed wound healing in diabetic individuals, the result of enhanced antioxidant function.⁸¹

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Reishi 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, Reishi mushrooms offer direct protection against such threats.²⁷

Studies show, for instance, that pre-treating animals with Reishi 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

Reishi mushroom extracts similarly protect liver tissue from the toxic effects of certain bacterial infections. In animals with such infections, Reishi polysaccharides inhibit inflammation in liver cells.²⁹ Other studies reveal that Reishi polysaccharides restore natural liver antioxidant systems to normal function following an infection, while inhibiting liver enzymes that produce excessive oxidative stress.^{30,31} Reishi 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 Reishi 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 Reishi 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.

Summary



Reishi 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 Reishi'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. Reishi mushrooms contribute to enhanced immune surveillance that can seek and destroy cancer cells before they can form threatening tumors.

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

If you have any questions on the scientific content of this article, please call a Life Extension® Health Advisor at 1-866-864-3027.

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