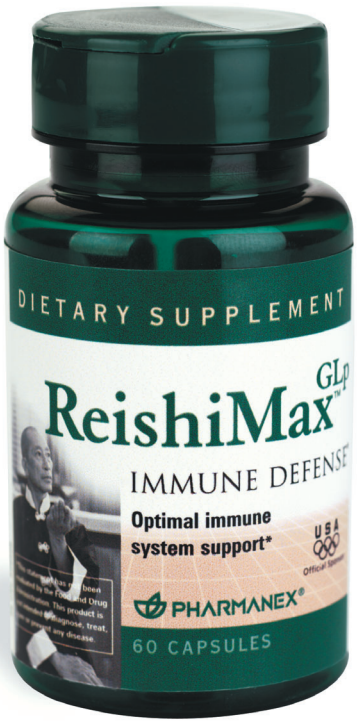
ReishiMax™

Consumer Product Guide

Formulated to provide long-term nutritional support for a healthy immune system*.

Scientifically Tested for Safety and Efficacy.



Supports a Healthy Immune System*

STANDARDIZED REISHI MUSHROOM EXTRACT

PHARMANEX®

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ReishiMax™

Supports a Healthy Immune System*

Summary

ReishiMax™ is a dietary supplement developed and manufactured by Pharmanex, LLC, formulated to provide long-term nutritional support for a healthy immune system. ReishiMax™ has been demonstrated to support healthy immune system function and stimulate immune cell proliferation. ReishiMax™ is a proprietary Reishi extract, containing the highest level of actives currently on the market. This standardized product also incorporates cracked spores, a novel technology that releases Reishi's active ingredient, providing unique immune activity not found in other Reishi products.*

What is ReishiMax™?

History of Reishi

Reishi (*Ganoderma lucidum*) mushroom is a fungus occurring as a shelf-like form on the sides of fallen broad leaf trees and stumps. Reishi, also known in Asia as Lingzhi, is a basidiomycete and belongs to the family Polyporaceae. In nature, Reishi grows in densely wooded mountains with high humidity and low light and has been found primarily in China and Taiwan. The spores of Reishi have very tough outer husks with several layers. Reishi is a rare mushroom and is extremely hard to cultivate. In 1971, Yukio Naoi, a researcher at Japan's Kyoto University, successfully developed artificial wood log cultivation of Reishi. This discovery led to the ability to cultivate Reishi in large quantities with reproducible and consistent production. There are 62 types of Reishi, of which six are most common — red, purple, blue, yellow, black, and white. Pharmanex has chosen to use red Reishi in ReishiMax™ because it can produce the highest quality extract and has been subject to the most scientific evaluation (INPR 1998, HKU 2001).

Reishi is one of the earliest herbal remedies recorded in *Shen Nong Ben Cao Jing*, between the years of 206 B.C. — 8 A.D. (Shen 1997). Reishi, also known as Lingzhi, is one of the most valued and potent herbal products in Traditional Chinese Medicine (TCM). In China, Reishi is a TCM herb of choice as a general tonic for promoting longevity, vitality and endurance, and for health preservation.* As recorded in *New Compilation of Materia Medica* (y. 1757), Reishi "benefits heart and lung, nourishes the essence and vital energy, prevents from illness, and acts for millennia as a longevity-promoting herbal tonic."* (Chang 1986, Ying 1987, Hsu 1986). Reishi is listed in the *Shen Nong Ben Cao Jing* as 'superior grade' (Shen 1997). This grade is reserved only for TCM herbs that are non-toxic tonic herbs that are without side effects even when taken for a prolonged period of time.

Cell-Mediated Immunity

The immune system is intricate, with a variety of functions vital to health. When functioning properly, the immune system is a formidable defense mechanism essential to maintaining optimal health. It recognizes a seemingly infinite number of viruses and bacteria and will even defend against changes in our own cells that pose serious threats to our well being. The immune system helps to prevent the consequences of these changes by removing damaged or aged cells and identifying and destroying altered cells damaged by oxidative stress.

There are two main functional components of the acquired immune system — humoral immunity and cellular immunity. Both of these systems overlap and work together synergistically to afford an effective immune system. The first — humoral immunity — hinges on the antibody. Produced by lymphocytes called B cells, antibodies latch onto and neutralize foreign invaders such as bacteria and viruses.

The second arm of the acquired immune system, cell-mediated immunity, is directed by T lymphocytes. This system differs not only in its function, but also in the way that it detects foreign invaders. When a T cell encounters a problem it will react in one of two ways depending upon whether the T cell is a helper (CD4) or a cytotoxic (CD8) T cell. Helper T cells send for help from other cells, including B cells, via chemical signals. Cytotoxic T cells, on the other hand, develop the ability to attack target cells directly and secrete chemicals that kill infected or aberrant cells.

Both B and T lymphocytes get a helping hand from various other cells in the immune system such as monocytes and macrophages, neutrophils, and a host of other cell types. Maintaining a healthy immune system includes getting enough sleep, reducing stress, and avoiding toxins such as cigarette smoke and industrial pollution that put an extra burden on our natural defenses. A healthy, balanced diet rich in dietary ingredients that have been demonstrated to support optimal immune function can also provide much needed support to a healthy immune system.

Primary Active Constituents

ReishiMax™ is composed of Reishi fruiting bodies and cracked spores. The key active constituents found in Reishi include polysaccharides (beta-1,3-glucans) and triterpenes (ganoderic acids and others). Other ingredients naturally found in Reishi include nucleosides, fatty acids (oleic acid), and amino acids. The active ingredients in ReishiMax™ are standardized to 6% triterpenes and 13.5% polysaccharides, which is the highest level of actives available in a Reishi extract. ReishiMax™ also contains a 1% extract of 100% cracked spores.

In 2002, there were two studies published in peer-reviewed journals identifying new potentially active compounds in ReishiMax™ GLp. The first study, conducted by Chi-Huey Wong at Academia Sinica in Taiwan, found that ReishiMax™ contains unique polysaccharides that are responsible for immuno-modulating activities (Wang 2002). The second study, published in the *Journal of Natural Products*, conducted by Scientists at the Pharmanex Research Institute in Provo, Utah, identified three new lanostanoid compounds in ReishiMax™ (Ma 2002).

Health Benefits

ReishiMax™ supports healthy immune system function by stimulating cell-mediated immunity with a proprietary standardized Reishi formula. According to the results of animal and *in vitro* studies, Reishi has been demonstrated to stimulate the formation of antibodies, stimulate the ability of proliferation of immune cells, and modulate the functions of T cells. ReishiMax™ is intended for adults who wish to maintain a healthy immune system; who smoke or who are frequently exposed to environmental pollutants; who do not get enough sleep; or who feel run down.*

Pre-Clinical & Clinical Evidence of Efficacy

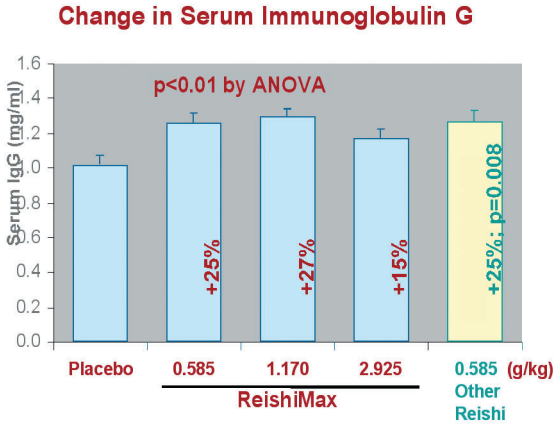
Reishi has been shown to support immune function and enhance immune cell proliferation in animal, *in vitro*, and clinical studies.*

Pre-Clinical Studies

Ample amounts of data from animal and *in vitro* studies strongly support that Reishi extracts can enhance cellular immunity by influencing lymphocytes, natural killer (NK) cells, cytokines, macrophages, and histamine release from mast cells, thus resulting in improved health benefits.* The data from numerous animal models and *in vitro* studies performed with various Reishi extracts is summarized below:

Lymphocytes	↑ Lymphocytes (Wang 1997) ↑ IFNϒ production from T-lymphocytes (Zhang 1999) ↑ T-cell mediated response suppressed by Morphine (Lu 1994) ↑ B-cell mediated response suppressed by Morphine (Lu 1994)
Natural Killer Cells	↑ Proportion of NK cells among mononuclear cells (Lieu 1992, Chen 1995) ↑ Splenic NK cell activity (Shiuh 1995) ↓ Splenic NK cytotoxicity (Shiuh 1995) ↑ Spleen cell proliferation (Wang 1997)
Cytokines *(Interleukins)*	↑ IL-1, IL-2, and IL-6 (Wang 1997,Lieu 1992) ↑ IL-2 suppressed by hydrocortisone (Lei 1993) ↑ IL-1/IL-2 suppressed by Morphine (Lu 1994)
Macrophages	↑ Macrophage phagocytosis (Lu 1994)
Histamine	↓ Histamine release from mast cells (Kohda 1985)

An unpublished comparative study recently conducted by the Medical Institute at National Taiwan University found that ReishiMax™ enhanced immune function in mice compared to placebo (Chiang 2002). After six weeks, ReishiMax™ increased serum immunoglobulins (IgG, IgM, IgA), increased proliferation of lymphocytes, and increased secretion of cytokines (IL-2, IL-5, IL-6) and IFN_ (see graphs below).



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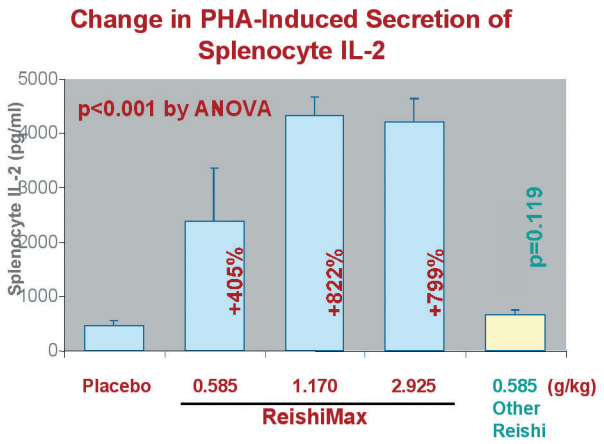

In relation to serum IgG, ReishiMax™ was 25% more effective than placebo, and just as effective as the leading Reishi competitor in Taiwan (at 0.585 g/kg). In relation to IL-2, ReishiMax™ was 405% more effective than placebo, and was also more effective than the leading Reishi competitor in Taiwan (at 0.585 g/kg).*

Clinical Studies

In clinical studies, Reishi extracts have been shown to increase levels of T-cell counts, CD4/CD8 ratio, cytokine IL-2, complement C3 and immunoglobulin G, lower levels of T-suppressor cell counts, improve vigor and appetite, and shorten recovery time (Kupin 1992, Yang 1996).* An open-label, comparative study evaluated the health benefits of Reishi supplementation in 48 individuals. Compared to controls, immune cell proliferation was improved. No adverse effects were seen with Reishi administration (Kupin 1992).

Another open-label, comparative clinical study evaluated the health benefits of Reishi supplementation in 37 subjects. After six weeks, the values for debility and weakness were lowered by 53.6%. Their lymphoid transformation rate increased, and levels of IL-2, complement C3, and immunoglobulin G were significantly higher after supplementation with Reishi ($p<0.05$) (Yang 1996).

Proprietary Processing

The combination of quality ingredients, qualified manufacturers, certified independent laboratory verification, and a continuous drive to supply leading edge products, ensure our distributors and consumers the highest quality products available in the industry. The constituents in ReishiMax™ are standardized through scientific and analytical methods to ensure that every capsule contains the specific level of constituents, every time. The production, quality control, safety, and efficacy studies for ReishiMax™ have been reviewed and approved by the Taiwan Department of Health (DOH) and Expert Committee (DOH 2002). A health food license was granted for ReishiMax™ by the Taiwan DOH in April 2002, one of only 23 licenses that have been issued for health foods by the DOH.

ReishiMax™ is produced through solid wood log cultivation, which requires a 120–200 day cultivation period. This method is preferred to sawdust and liquid cultivation because it yields both polysaccharides and triterpenes from the fruiting body. In addition, other cultivation methods are prone to contamination and are difficult to control quality. Pharmanex has developed an exclusive multi-step extraction process that increases the yield and concentration of active ingredients. Most Reishi products only use one extraction process, which results in a product with lower concentrations of active ingredients, and often lacks the triterpene compounds. The first step of Pharmanex's extraction process concentrates the triterpenes, while the second step concentrates the polysaccharides. The third and final step in Pharmanex extraction process utilizes an exclusive technology that detaches additional polysaccharides from the cell walls. The resulting product, ReishiMax™, is standardized to 6% triterpenes and 13.5% polysaccharides, which is the highest level of actives currently available in a Reishi product.

ReishiMax™ also incorporates a novel cracked spore technology, which releases additional active ingredients, providing unique immune activity not found in other Reishi products.* Reishi spores are minute brown egg-shaped reproductive cells that are released by the mushroom at maturity. The spores are protected by an extremely hard shell, which prevents the polysaccharides and triterpenes contained in the spore from being absorbed. Pharmanex uses technology which mechanically 'cracks' the spores, making the active ingredients bioavailable (see picture below).

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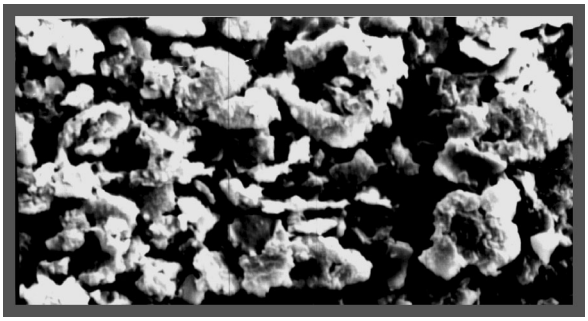

All ingredients are tested for purity, and where applicable, ingredients are certified pure by microbial testing, such as tests for *Salmonella, E. coli*, other coliforms, *Staphylococcus aureus*, total plate counts, yeasts, molds and pesticide residues. Our manufacturers go through a detailed selection and certification process to assure their compliance with Good Manufacturing Practice (GMP) standards set by the Food and Drug Administration (FDA).

Side Effects

There have been very few reported side effects at the recommended dosage. However, in higher doses (1.5 to 1.9 grams/day), some people have experienced temporary symptoms of sleepiness, thirst, rashes, bloating, frequent urination, abnormal sweating, and loose stools (Teow 1996).

Safety and Toxicity

ReishiMax™ is safe and well tolerated at the recommended dosage. According to Traditional Chinese Medicine, Reishi is categorized as 'superior grade' and has no toxic effects (Shen 1997). In animal studies, Reishi has been shown to be non-carcinogenic, has not produced hepatic toxicity, and has not impaired growth or development (Chang 1986).

Contraindications/Drug Interactions

If you are pregnant or lactating, or taking a prescription medication, consult a physician prior to use. Reishi has been shown to inhibit platelet aggregation, so people taking anticoagulants should consult with a physician (Shimizu 1985). Because Reishi may enhance immune cell proliferation,* caution is advised for those people receiving immunosuppressive therapies or who have been diagnosed with an immune disorder (INPR 1998). Individuals with known fungal allergies should be cautious when taking Reishi (Horner 1993). Discontinue use of this product 2 weeks prior to and after surgery; a physician should be notified prior to surgery if supplementation was continued during the 2-week washout period.

Directions for Use

As a dietary supplement, take one to two capsules of ReishiMax™ with liquid at your morning and evening meals. For optimal health benefits, take one (1) capsule twice daily for health maintenance, and two (2) capsules twice daily for more proactive immune modulation.

How Supplied

ReishiMax™ is supplied in a 15-30 day supply of 60 capsules. Each capsule contains 495 mg of standardized Reishi mushroom extract and 5 mg of Reishi cracked spores.

Storage

Store in a cool, dry place. Avoid excessive heat. Protect from light.

Shelf Life

Expiration date and lot code numbers are stamped on the bottle.

Warnings

Keep out of reach of children. If you are pregnant or nursing, or taking a prescription medication, consult a physician before using this product.

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The Pharmanex 6S Quality Process™

Central to the Pharmanex mission of transforming time-honored, traditional preparations into health promoting botanical products with known content and consistent activity is the Pharmanex 6S Quality Process.™

Selection	• Exhaustive scientific review of research and databases is conducted. • Authenticity, usefulness, and safety standards are determined.
Sourcing	• Teams of experts investigate potential sources and evaluate quality. • Comprehensive botanical and chemical evaluations are completed.
Structure	• Structural analyses of natural compounds are determined. • Active ingredients are isolated and studied.
Standardization	• Strict standardization to at least one relevant marker molecule is required. • Proprietary processing methods to increase consistency and ensure measured dose effectiveness are developed.
Safety	• Safety is assessed from available research. • Microbial test, chemical, toxin, and heavy metal analyses are conducted.
Substantiation	• Documented pre-clinical and clinical studies are reviewed. • Pharmanex sponsored studies are initiated when appropriate.

For More Information:

To learn more about the Pharmanex line of natural healthcare products, please call Product Support 1-800-487-1000.

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