

Key Features:

- Features Highly Concentrated Extracts (**7,150 mg DHE*/capsule**) of **Astragalus, Elderberry, American Ginseng, Eleuthero, and a synergistic blend of Medicinal Mushroom extracts**
- Mushroom extracts utilize **hot-water extraction + ethanol precipitation** processes to retain the most bioactive constituents (i.e. adenosine, triterpenes, and polysaccharides) stored within.

Indications:

- Support healthy immune system & reduce the frequency of upper respiratory tract infections (URTIs)
- Relieve the symptoms of chronic allergic rhinitis & sinusitis
- Help increase energy and resistance to stress

Description:

Immutonin is formulated with synergistic immune tonic herbs and designed as a preventative formula against infections for those with compromised immunity, chronic allergies, and/or frequent recurrent infections.

Uses in Autoimmune Conditions?

Immune supporting herbs like Astragalus and Elderberry are often considered an ‘immune-stimulant’ due to their stimulating effects on the immune cells via cytokine-mediated mechanisms to protect against infections, and therefore, advised by many as a contraindicated herb for people with autoimmune conditions. However, many of these in vitro studies only provide a narrow glimpse, not the totality, of the herbs’ effects on the immune system.

Before considering the concerns and real value of immune-tonic nutraceuticals in autoimmune conditions, it is helpful to delve a little deeper into the nature of cytokines.

Cytokines are Immune-Modulating, Not Inflammatory.

Cytokines are a group of small proteins (<40kDa) that play a pivotal role in immunomodulation. The immune system uses them to coordinate the various immune cells in a network of pathways. Cytokines can be categorized into: interleukins (IL), chemokines, interferons (IFN), tumor necrosis factors (TNF), and growth factors; where ILs are the predominant group of cytokines during infections.

Cytokines signal immune cells to carry out a well-regulated response, whether that means to induce inflammation to fight pathogens or to reduce inflammation to allow tissue repair and debris clean-up.

The pro-inflammatory cytokines, such as TNF-alpha, IL-1 alpha & beta, IL-6, IL-12, and IL-17, are implicated in systemic infections or sepsis.^[1]

Anti-inflammatory cytokines, including IL-1 receptor antagonist (RA), IL-4, IL-10, IL-11, and IL-13, work by:^[1,2]

1. directly blocking the inflammatory signals of the pro-inflammatory cytokines
2. promoting the shift from the innate immunity (i.e. first-line, broad-spectrum defense) to adaptive immunity (i.e. latent targeted defense involving antibodies)
3. reducing the production of inflammatory cytokines

Astragalus and Elderberry both possess anti-inflammatory and anti-oxidant properties. Traditional indications and research have both shown

Quantity: 84 Vegetarian Capsules

Ingredients (per capsule) (7,150 mg DHE*):

Astragalus Extract (<i>Astragalus membranaceus</i>) (8:1).....	100 mg (0.5% astragaloside; 40% polysaccharides) (root) (800 mg DHE*)
Elderberry Extract (<i>Sambucus nigra</i>) (64:1).....	25 mg (certified organic) (14% anthocyanins) (fruit) (1,600 mg DHE*)
American Ginseng Extract (root) (8:1).....	50 mg (5% ginsenosides) (<i>Panax quinquefolius</i>) (400 mg DHE*)
Eleuthero Extract (15:1) (0.8% eleutherosides).....	50 mg (<i>Eleutherococcus senticosus</i>) (root) (750 mg DHE*)
Zinc (from zinc bisglycinate).....	.5 mg

Synergistic Mushroom Blend 275 mg (3,600 mg DHE*)

Reishi Extract (<i>Ganoderma lucidum</i>) (16:1) (40% polysaccharides)
300 mg; Cordyceps Cs-4 Extract (<i>Ophiocordyceps sinensis</i>) (8:1) (7% cordycepic acid) 50 mg; Maitake Extract (<i>Grifola frondosa</i>) (8:1) (40% polysaccharides) 50 mg; Lion's Mane Extract (<i>Hericium erinaceus</i>) (10:1) (30% polysaccharides) 50 mg; Shiitake Extract (<i>Lentinula edodes</i>) (12:1) (30% polysaccharides) 50 mg; Turkey Tail Extract (<i>Trametes versicolor</i>) (10:1) (30% polysaccharides) 50 mg
*DHE - dried herb equivalent

Non-medicinal Ingredients: L-Leucine, silicon dioxide, apple fibre, hypromellose (capsule)

Suggested Use: Adults - Take 2 capsules with food, 2 times per day, or as directed by your health care practitioner.

their beneficial, ‘immune-regulating’ effects in autoimmune conditions, such as psoriasis, rheumatism, neurodegenerative conditions, and type 1 diabetes.^[3-5,14]

Astragalus - A Preventative Measure. Not for Acute Infections

Astragalus is used in Traditional Chinese Medicine (TCM) to support the ‘Defensive Qi’ (ie. immunity) and tonify Qi and Blood (ie. energy and nutrient/ waste exchange). Although it’s commonly seen in formulas to treat URTIs, Astragalus is actually contraindicated in acute infections in TCM, except for those with clear signs of ‘Qi-deficiency’, because it strengthens the ‘defensive Qi’ by ‘closing the pores’. When pathogens (e.g. wind-heat) managed to penetrate the defense and reside deeper in the systems, the pores would need to be opened to release the heat (i.e. sweating), not staying closed; therefore, Astragalus is more indicated in the prevention of infections and should be stopped once acute symptoms of infections develop.

Astragalus has been shown to modulate the immune response of the body by activating heparanase, promoting the release of IL-1beta, IL6, IL-8, and TNF-alpha in macrophages, increasing the proliferation and differentiation of B and T lymphocytes; as well as balancing the T-cell subgroups, regulating NK cell activities, and increasing the level of anti-inflammatory cytokine – IL-10.^[6-8]

Astragalus has demonstrated its ability to directly inhibit the replication process of



influenza, coxsackie-, and hepatitis B viruses^[9-12], as well as antibacterial activities against common diarrheal bacterial pathogens, such as Salmonella, Shigella, and Campylobacter.^[13]

Elderberry - An Immune Support Medicine & Functional Food

Sambucus nigra (Elderberry) is traditionally used to help relieve cold/ flu symptoms, sinus congestion, as well as an “alterative” (i.e. cleansing) in inflammatory conditions such as psoriasis and rheumatism.^[14] It has been shown to possess both anti-bacterial and antiviral properties, especially against various strains of influenza virus, Streptococci, and Herpes simplex.^[15-16]

Elderberry is also rich in vitamins, minerals, and antioxidants, such as proanthocyanidins, caffeic acid, rutin, and quercetin.^[17] It has been shown to carry out anti-inflammatory effects via its inhibitory actions on cyclooxygenase enzymes and nitric oxide production by macrophage and dendritic cells, making it an excellent immune-modulating herb for autoimmune conditions.^[18-19]

American Ginseng

American Ginseng contains polysaccharides and ginsenosides that have demonstrated immune-modulatory effects, including the stimulation of immunoglobulin production and the enhancement of natural immune responses by macrophages, as well as the regulation of the microbiome.^[20] Moreover, in a study on human peripheral blood mononuclear cells cultured with live influenza virus, American ginseng extract was shown to be effective at enhancing the production of IL-2 and IFN-γ, which are major T-cell and natural killer cell cytokine responses associated with virus-elicited adaptive immunity.^[21]

Eleuthero

Eleuthero is traditionally used as an adaptogen to support the body's resilience to stress, meaning its effects involve the endocrine system, the nervous system, and the immune system. It's demonstrated the ability to promote the activity of T cells, predominantly the T helper, T cytotoxic T, and NK cells, as well as directly inhibit the replication of RNA viruses, such as rhinovirus, respiratory syncytial virus, and influenza A.^[22-23]

Synergistic Medicinal Mushroom Blend

Among a myriad of bioactive compounds in medicinal mushrooms, polysaccharides have attracted the most attention. They are an extremely diverse array of sugar polymers that vary between mushroom species and also between the fruiting body and mycelium within a species.

Beta-glucan is among the most recognized polysaccharides for its immune-supporting benefits. However, this does not translate into beta-glucan isolate supplements being superior to multi-mushroom formulas. Combinations of mushrooms have been shown to maximize host-mediated immune response. Each species has a unique polysaccharide composition, and a variety of polysaccharides has been shown to activate a wider spectrum of immune system receptor sites.^[24] An abundance of various polysaccharides maximizes the activity and quantity of macrophages, killer T cells, and NK lymphocytes.^[25] Combining mushrooms allows for broader therapeutic effects and greater effects than would be obtained using single mushrooms.

Is Hot-Water Extraction the Best Method of Preparation for Medicinal Mushrooms?

Hot-water extraction is the most common method used in mushroom extracts. While it can obtain most of the ‘polysaccharides’ and other

water-soluble nutrients, it cannot separate the ‘bioactive’ ones (e.g. beta-glucan, triterpenoids, adenosines) from the ‘non-bioactive’ ones, such as sugars and starch.

However, combining hot-water extraction with an additional process called ‘ethanol precipitation’ can further isolate the bioactive compounds by effectively removing the non-active, highly polar molecules including sugars, starch, salts, and amino acids/proteins. The end product is a more potent extract with higher concentrations of active constituents.

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