

# Immunitone Plus™



**Botanical and mushroom extracts for healthy immune system support\***

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**Immunitone Plus™** is a comprehensive herbal formula designed to support healthy immune system function especially during cold and flu season.\* It contains herbs that support normal natural killer (NK) cell activity and the balance of cytokines, which are the regulatory proteins released by immune cells as part of a normal immune system response. The standardized herbs in this formula contain optimal and consistent amounts of the most active ingredients. Immunitone Plus™ is suitable for long term use and for all age groups.

## Highlights

**Echinacea (*Echinacea angustifolia*)** is a native plant of North America whose roots and aerial parts have been used traditionally for colds, respiratory infections, bacterial infections, and wound healing as the extracts possess antiviral, antibacterial, antioxidant, and immunostimulatory properties due to its high content of alkylamides, phenols, flavonoids, and polysaccharides.<sup>1,2</sup> Immunitone Plus™ provides 600 mg of echinacea root extract standardized to contain 4% echinacosides. A study of healthy human subjects showed that 100 mg of *echinacea angustifolia* root extract administration once per day for a month significantly upregulated mRNA levels of anti-inflammatory IL-2 and IL-8 cytokines, and downregulated proinflammatory tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ) and IL-6 expressions in lympho-monocytes, suggesting this herb's ability to control cytokine expression.<sup>3</sup>

**Astragalus extract (*Astragalus membranaceus*)** and related species are native to China and considered one of the most important and widely utilized adaptogenic herbs in Traditional Chinese Medicine (TCM). Western herbalists began using astragalus in the 1800s as an ingredient in various immune tonics. In TCM, astragalus is commonly found in mixtures with other herbs and is used as an immune stimulant, antioxidant, diuretic, antidiabetic, hepatoprotectant, antiviral, expectorant, and anticancer tonic for numerous conditions and disorders.<sup>4</sup> Extracts made from the roots of *Astragalus membranaceus* have been shown to promote functions in both the innate and acquired immune responses.<sup>5</sup> Human and animal *in vitro* studies have demonstrated its abilities to induce monocyte activation, migration and maturation, reverse iNOS expression, and inhibit cytokine productions by suppressing MAPK and NF- $\kappa$ B signaling pathways. Moreover, it has been shown to stimulate T-cell mitosis, increase antibody response and lymphocyte development, activate human CD4+ and CD8+ T cells, and regulate the balance of Th1/Th2 cytokines.<sup>5</sup> Additionally, in immunosuppressed mice, astragalus preparations promoted NK cell activity and improved B-lymphocyte proliferation.<sup>6</sup>

**Elderberry (*Sambucus nigra*)** Elderberry, commonly referred to as European elder, is grown in most parts of Europe, North Africa, West Asia, and now the U.S., and nearly every part of the plant is utilized either medicinally, as dietary supplements, or for culinary use.<sup>7</sup> The flowers and berries of *Sambucus nigra* are most often used medicinally and contain a plethora of flavonoids that have been found to possess a variety of biochemical and pharmacological actions, including anti-inflammatory, antiviral, anti-carcinogenic, antioxidant and immunologic properties. Research demonstrates that of all fresh fruits or berries, elderberry measures as one of the highest in antioxidant capacity and is one of the most commonly used botanicals for medicinal purposes in the world.<sup>8</sup> In a meta-analysis, *Sambucus nigra* supplementation was found to significantly attenuate upper respiratory symptoms and may be a much safer and effective alternative to prescription medications for influenza, the common cold, and viral infections of the upper respiratory tract.<sup>9</sup> An *in vitro* study examining extracts from American-cultivated elderberries on microglial cells showed remarkable antioxidant properties by suppressing interferon- $\gamma$ -induced reactive oxygen species and P-ERK1/2 expression.<sup>8</sup>

**Andrographis (*Andrographis paniculata*)** is an annual herb that was regularly used for the common cold as part of traditional medicinal systems for centuries.<sup>10</sup> In an RCT, *A. paniculata* administration resulted in a 2.1-fold higher prevention rate of the common cold compared to placebo.<sup>10</sup> It has been shown to act as an immune stimulant, and to activate the peroxisome proliferator-activated receptor- $\gamma$  (PPAR $\gamma$ ) nuclear receptor. When activated, PPAR $\gamma$  regulates the immune and inflammatory responses via inhibiting the binding of NF- $\kappa$ B to DNA, which reduces the production of various downstream inflammatory cytokines such as TNF- $\alpha$  and interleukin-1 $\beta$ ,<sup>11</sup> and suppresses iNOS, COX-2, IFN- $\gamma$ , IL-2 expression.<sup>10</sup>

**Green Tea Extract (*Camellia sinensis*)** has been standardized to contain 98% polyphenols and 45% epigallocatechin gallate (EGCg). EGCg is the most powerful bioactive constituent among green tea extract; it has been shown to be one of the most potent immunoregulatory and anti-inflammatory flavonoids.<sup>12</sup> An RCT showed that *Camellia sinensis* intake significantly enhanced T cell function and is safe and effective for helping to prevent cold and flu symptoms.<sup>13</sup>

**Larch Arabinogalactan (*Larix laricina*)** stimulates the immune system by potentiating the effect of the reticuloendothelial system and activating phagocytosis.<sup>14</sup> This formula has a significant effect on enhancing beneficial gut microflora, specifically *Bifidobacteria* and *Lactobacillus*, and directly affects the immune system via interacting with intestinal gut-associated lymphoid tissue.<sup>15</sup> Larch arabinogalactan was shown in both human and animal studies to support the body's innate immune system by enhancing NK cell and macrophage activity and upregulating pro-inflammatory cytokine expression.<sup>15</sup> In an RCT, larch arabinogalactan decreased the incidence of the common cold by 23% by increasing the body's ability to defend against the infection; it also improved serum antigen-specific IgG and IgE response according to vaccination studies.<sup>15</sup>

**Lauric Acid (LA)** is a twelve-carbon saturated fatty acid primarily found in coconut oil, coconut milk, and palm kernel oil that has been shown to have antimicrobial properties. An *in vitro* study testing the effects that virgin coconut oil (VCO) had on *Staphylococcus aureus* (an often antibiotic-resistant bacteria strain) demonstrated VCO to inhibit the growth of *S. aureus* and increase phagocytic immune cell activity.<sup>16</sup> In a murine and human cell culture study of autoimmune neuroinflammation, LA increased systemic Th17 and Th1 cell polarization and proliferation, and increased the influx of Th17 cells into the small intestine, demonstrating dietary fatty acids have a profound influence on T cell differentiation in the gut and on the gut microbiome.<sup>17</sup>

**Medicinal Mushrooms**  
Medicinal mushrooms are a rich source of immune-enhancing beta-glucans.<sup>18</sup> **Cordyceps mushroom (*Cordyceps sinensis*)** can help improve immune function by enhancing NK cell activity. **Shiitake mushroom (*Lentinula edodes*)** was traditionally used for immune system stimulation, cholesterol-lowering, and antiaging. More recent research has focused its attention on the potential of *Lentinula edodes* to be used as an antibacterial, antiviral, antifungal, antioxidant, and anti-inflammatory agent.<sup>19-23</sup> In both human and animal *in vitro* studies, lentinan has been shown to modulate the immune system through selective induction of inflammasome and cytokine expression as well as activation of natural killer and T-helper cells.<sup>22,23</sup> Extracts of **maitake mushroom (*Grifola frondosa*)**, and particularly the beta-glucan polysaccharide constituent, have been associated with immunomodulatory and immunostimulatory activity in pre-clinical studies.<sup>20,24</sup> **Reishi mushroom (*Ganoderma lucidum*)**, known as the "mushroom of immortality" in China, possesses anti-inflammatory, antiviral, immune-modulating, and antioxidative properties. Reishi has been shown to promote Th1 immune response *in vitro* and *in vivo* by activating CD3+, CD4+, and CD8+ T cells.<sup>25,26</sup>

### Medicinal Mushrooms

**Beta 1,3 Glucan** Beta-glucan is a soluble fiber derived from the cell walls of algae, bacteria, fungi, yeast, and plants, and is commonly used for its immuno-modulating effects.<sup>27,28</sup> Vaccine research shows that beta-1,3 glucan from fungal cell walls produces robust humoral and cellular immune responses when exposed to antigens.<sup>29</sup>

Warning: Not recommended for pregnant or lactating women.

### Recommended Use:

- As a dietary supplement, take four capsules per day with meals, or as directed by your health care practitioner.

For a list of references cited in this document, please visit:

<https://www.designsforhealth.com/techsheet-references/immunitone-plus-references.pdf>

**ImmunEnhancer® is a registered trademark of Lonza, Inc.**

Dosing recommendations are given for typical use based on an average 150 pound healthy adult. Healthcare practitioners are encouraged to use clinical judgement with case-specific dosing based on intended goals, subject body weight, medical history, and concomitant medication and supplement usage. Any product containing botanical substances has the potential for causing individual sensitivities. Individual monitoring, including liver function tests, may be appropriate.

\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

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## Supplement Facts

Serving Size 4 capsules  
Servings Per Container 30

Amount Per Serving	% Daily Value	Amount Per Serving	% Daily Value
Echinacea ( <i>Echinacea angustifolia</i> )(root) [standardized to contain 4% echinacosides]	600 mg *	Arabinogalactan (as ImmunEnhancer® ) ( <i>Larix laricina</i> )(larch tree)	100 mg *
Astragalus Extract ( <i>Astragalus membranaceus</i> )(root)	200 mg *	Lauric Acid	100 mg *
Elderberry ( <i>Sambucus nigra</i> )(fruit)	200 mg *	Cordyceps mushroom ( <i>Cordyceps sinensis</i> )	50 mg *
Andrographis ( <i>Andrographis paniculata</i> )(aerial) [standardized to contain 4% andrographolides]	200 mg *	Shiitake mushroom ( <i>Lentinula edodes</i> )	50 mg *
Green Tea Extract ( <i>Camellia sinensis</i> )(leaves) [standardized to contain 98% polyphenols, 45% EGCg]	100 mg *	Maitake mushroom ( <i>Grifola frondosa</i> )	50 mg *
		Reishi mushroom ( <i>Ganoderma lucidum</i> )	50 mg *
		Beta 1,3 Glucan	9 mg *
		*Daily Value not established.	

Other Ingredients: Cellulose (capsule), microcrystalline cellulose, tricalcium phosphate, vegetable stearate, silicon dioxide.