

## Immune Formula

Product Code: 1839 (90 capsules)



Immune Formula (Immune) is a blend of natural ingredients known to help maintain a healthy immune system. It also acts as an antioxidant to strengthen the body.

Immune Formula is a combination of beta-glucans, arabinogalactan, colostrum, reishi mushroom, maitake mushroom and cordyceps.

For maintenance, take 1 capsule between meals two or three times daily. For periods of immune system stress, take 6-10 capsules daily (90 capsules per bottle).

**Maitake and Shiitake mushrooms** have been used in traditional Asian medicine to stimulate the immune system and treat cancer and other chronic wasting diseases. These medicinal mushrooms contain numerous phytochemicals that have been shown to slow, reverse or even prevent the growth of tumors in both animal and human clinical trials. Mushroom extracts appear to prevent tumor growth by increasing the activity of immune cells, rather than by killing cancer cells directly.<sup>23</sup>

**Maitake mushroom** has been shown to increase the activity of immune cells such as macrophages, natural killer (NK) cells and T-cells, as well as enhance production of interleukin-1 (IL-1), which activates T-cells. Maitake has been shown to inhibit tumor growth in animal studies, with evidence suggesting it is also effective against human tumors. In addition, a recent *in vitro* study confirmed that a beta glucan extract of maitake may have great potential as an alternative therapy for prostate cancer. Researchers have also identified hepatoprotective (liver-protecting), hypoglycemic (blood sugar-lowering), and hypotensive (blood pressure-lowering) effects from maitake.<sup>23-30</sup>

**Shiitake mushroom** has been studied since the 1960's for its anti-tumor and immune-potentiating properties. Shiitake is the source of *lentinan*, a substance that exhibits proven pharmacological effects—it stimulates the activity of T-cells and natural killer (NK) cells and increases production of interferon, interleukin-1 and 2, and tumor necrosis factor (TNF)—substances that play a critical role in the destruction of tumor cells. In human clinical trials, lentinan demonstrated antitumor activity and increased the survival time of patients with inoperable gastric cancer and women with recurrent breast cancer who had undergone surgery—women receiving lentinan following surgery experienced far greater tumor growth regression than what surgery alone provides. Shiitake has also been studied for its cholesterol-lowering and anti-viral properties.<sup>31-34</sup>

**Beta glucans**, naturally occurring polysaccharides derived from algae, barley, mushrooms, oats and baker's yeast (*Saccharomyces cerevisiae*), have been recognized by researchers for over 40 years for providing immune-modulating activities associated with increased resistance to bacterial, viral and parasitic infections. Beta glucans stimulate the immune system, modulating both humoral and cellular immunity. For example, research shows that beta glucans enhance macrophage (a type of white blood cell) and natural killer (NK) cell activities. Beta glucans also facilitate the transmission of cellular information among the macrophages, T-cells, B-cells, antibodies, and interferons (substances that fights viral infection by inhibiting viral growth) and interleukins (substances that regulate immune system function), thus enhancing overall immune response.<sup>15-22</sup>

**Arabinogalactan**, a polysaccharide found in echinacea and in concentrated amounts in the Western larch tree (*Larix spp.*), is believed to be the constituent primarily responsible for echinacea's effective immune-stimulating properties. Arabinogalactan enhances natural killer (NK) cell activity and stimulates macrophage production of interleukin-1 (an immune system hormone that stimulates T-cell function) and interferon-beta 2 (a substance that fights viral infection). Such effects suggest that arabinogalactan may be beneficial in supporting the body's natural defenses in the prevention and treatment of colds and influenza. Research also indicates that larch arabinogalactan can reduce the occurrence and severity of otitis media (middle ear infections) in children. In addition, arabinogalactan enhances beneficial microflora in the gastrointestinal tract, as well as the production of butyrate, a substance that is essential for colon health and protects the intestinal mucosa against disease and carcinogens. Furthermore, combining arabinogalactan with antioxidants such as vitamin C may enhance its efficacy.<sup>6,23-29</sup>

**Colostrum** is provided by the mammary glands of mammals (including humans) during the first 24 to 48 hours following birth. Colostrum contains essential immune factors that are vital to a newborn's underdeveloped immune system, as well as certain growth factors to ensure proper development of all body cells. Important substances in colostrum also promote the development of bifidobacteria colonies, which create an environment within the body that is inhospitable for harmful bacteria. In general, colostrum provides an infant with protection against infection and allergens, signals the brain to regulate digestion, helps the stomach and digestive tract to mature, and supplies a unique array of high-energy nutrients to facilitate healthy development of the brain and nervous system.<sup>1-4,7-9</sup>

Many clinical studies have explored the numerous health benefits of colostrum, a substance that can recharge the immune system and destroy bacteria, viruses and fungi; speed the healing of all body tissues; enhance weight loss by burning fat and increasing bone and lean muscle mass; and even slow and possibly reverse the aging process. Clinical studies have been conducted around the world researching colostrum's beneficial effects on a wide range of diseases, including AIDS/HIV, allergies, autoimmune disorders, cancer, colds and flus, diabetes, gastrointestinal complaints, gingivitis, heart disease, herpes, and bacterial, viral and parasitic infections, to name a few.<sup>1-6</sup>

Before the introduction of sulfa drugs and penicillin, conventional medical doctors were "enthusiastic" about utilizing colostrum as an antibiotic. In addition, during the 1950's, colostrum was used for the treatment of rheumatoid arthritis; that is, until the wide-spread use of corticosteroids to treat inflammation became standard protocol. Interestingly, Dr. Albert Sabin, who developed the polio vaccine, discovered that colostrum provided antibodies against polio and recommended its use with children susceptible to infection. Furthermore, Ayurvedic physicians have used colostrum for medicinal purposes for thousands of years.<sup>1-4</sup>

Researchers conducting laboratory analysis of immune and growth factors in bovine (cow) colostrum have found that they are identical to the substances provided in human colostrum. However, bovine colostrum contains significantly higher levels of many of these nutrients. For example, human colostrum provides 2% of IgG (the most important immunoglobulin (antibody) in the body), while bovine colostrum provides 86% of IgG. In addition, bovine colostrum provides a special hormone that prevents the calf from developing a sensitivity to its mother's immune factors. Research indicates that bovine colostrum is biologically transferable to all mammals, including humans, which benefit from its immune-enhancing properties with no reported allergic or anaphylactic reactions thus far. Research has also confirmed that substantial amounts of orally-ingested bovine colostrum concentrate survive passage through the stomach to remain intact and active in the lower portions of the bowel.<sup>1-4,10,11</sup>

Colostrum provides 2 major types of nutrients: immune factors and growth factors. Many pharmaceutical companies have endeavored to genetically engineer, patent and market several of these individual substances. In turn, conventional medical specialists utilize many colostrum components—interferon, gamma globulin, growth hormone, IgF-1 and protease inhibitors—in the treatment of autoimmune disorders, cancer and chronic viral infections such as HIV.<sup>1-4,11</sup>

Colostrum contains 37 different immune factors that are essential for the healthy development and maintenance of immune functions, including:

*Immunoglobulins* (A, D, E, G and M) effectively neutralize bacteria, viruses, yeast and toxins in the lymph and circulatory systems—IgM destroys bacteria, IgG neutralizes toxins, while IgD and IgE are highly antiviral. *Lactoferrin* is an iron-binding protein providing antibacterial, antiviral and anti-inflammatory properties, as well as therapeutic effects against *Candida albicans*, cancer, chronic fatigue syndrome, cytomegalovirus, herpes, HIV and other infections; it also facilitates iron absorption and promotes the growth of bifidobacterium

*Proline-rich polypeptide* (PRP) is a hormone that regulates the thymus gland, stimulating under-active immune function and lowering an over-active immune system, thus helping autoimmune disorders such as lupus, multiple sclerosis (MS), rheumatoid arthritis, scleroderma, etc.

*Trypsin* and *protease inhibitors* protect colostrum immune and growth factors from being destroyed in the gastrointestinal tract, and prevent *H. pylori* bacterium from attaching to the stomach walls, thus inhibiting peptic ulcers

*Oligo polysaccharides* and *glycoconjugates* attract and attach to pathogens (disease-causing organisms) such as cholera, clostridium, cryptosporidia, difficile toxins A & B, entamoeba, *E. coli*, giardia, salmonella, shigella and strep (including *S. pneumoniae*), thereby preventing them from adhering to or entering the mucous membranes; these components also act as growth promoters for beneficial microflora

*Cytokines* are interleukins that regulate immune responses and increase T-cell activity and the production of immunoglobulins—Interleukin-10 is a powerful anti-inflammatory that is especially beneficial for treating arthritis, while interferon and lymphokines are among the most researched protocols for the cure for cancer.<sup>1-5,9-17</sup>

Colostrum has been shown to benefit over 60 known immune and autoimmune disorders, including Addison's disease, AIDS, allergies, arthritis, asthma, bacterial infections, chronic fatigue syndrome, candidiasis, Crohn's disease, cystic fibrosis, endometriosis, fibromyalgia, Grave's disease and Hashimoto's thyroiditis, Lupus erythematosus, multiple sclerosis, Myasthenia gravis, parasites, pernicious anemia, rheumatoid arthritis, and more.

In addition, recent research indicates that supplementation with bovine colostrum can reduce acute gastrointestinal injury associated with the use of non-steroidal anti-inflammatory drugs (NSAIDs). Results also suggest that colostrum may be of value in the treatment of other ulcerative conditions of the bowel.<sup>1,3,4,6,13,18-24</sup>

Growth factors in colostrum have been shown to increase cell and tissue growth by stimulating DNA/RNA formation. Research shows that colostrum growth factors can enhance levels of T-cells, speed the healing process, balance blood sugar levels and decrease insulin dependence, enhance muscle and bone growth and repair, and even burn fat. Growth factors in colostrum have also been shown to promote the repair and regeneration of the heart muscle and the regeneration of new blood vessels, thus helping to prevent and reverse heart disease. Specific growth factors found in colostrum include insulin-like growth factor-I and II (IgF-1 and IgF-II), epithelial growth factor (EgF), growth hormone (GH), as well as others. In fact, bovine colostrum provides one of the highest concentrations of IgF-1 found in nature.<sup>1-5,11,25,26</sup>

Colostrum's source of IgF-1 may prove helpful to those wanting to lose weight. The body requires IgF-1 in order to break down fat for energy through the Krebs's cycle—an important metabolic system that creates roughly 90% of the body's energy by oxidizing amino acids, fatty acids and carbohydrates. Unfortunately, the body produces less IgF-1 with age. Insufficient IgF-1 levels are linked with a higher incidence of Type II diabetes and an increased difficulty in losing weight, despite a healthy nutrition and exercise regimen. Thus, colostrum supplementation may help raise the body's levels of IgF-1 enough to stimulate increased fat metabolism. Furthermore, colostrum's rich source of growth factors have been shown to inhibit the breakdown of protein and stimulate protein synthesis, which may prove to have an anabolic (muscle-building) effect.<sup>1-5,11,26-28</sup>

In healthy individuals, colostrum can help maintain well-being and vitality. Colostrum provides a rich source of nutrients, improves digestion and cellular metabolism, increases endurance and speeds recovery time after exercise, and encourages lean muscle growth and fat metabolism. For example, a recent double-blind, randomized, placebo-controlled study found that colostrum supplementation significantly improved the sprint performance of healthy elite field hockey players, compared to whey protein. Furthermore, colostrum may even help reverse signs of aging. According to Dr. David Hurley, PhD, Associate Professor of Microbiology and member of the Infectious Disease Research Cluster, protection against infectious agents, systemic immune enhancement, and improved overall health and healing of the body are benefits available to anyone using colostrum as a dietary supplement, especially the young and elderly.<sup>1,3-5,29-30</sup>

Organically-produced, powdered or encapsulated powder supplements are considered superior over colostrum liquid or tablets, due to processing methods used to manufacture the latter. High-quality colostrum supplements should not include fat, whey or lactose, and should be certified free of pathogenic microorganisms, antibiotics, pesticides, herbicides, and steroids and synthetic hormones such as rBST (growth hormone shots for cattle).<sup>1-3,5</sup>

Adults with serious immune system disorders are often prescribed 1,000 to 2,000mg of colostrum to be taken twice daily on an empty stomach with 8-12 ounces of water. Although preventive doses have not been established, individuals may want to begin supplementation with 500mg per day, gradually increasing the dosage if desired. Children's dosages should be proportionately less. Herxheimer reactions (primarily flu-like symptoms) can occur in approximately 40% of individuals, as part of the body's natural healing response—symptoms typically disappear within 3-5 days with continued use at the same dosage level. Furthermore, after hundreds of years of use and over 1,000 clinical studies, colostrum has been shown to be completely safe, providing no drug interactions or side effects at any level of ingestion.<sup>1,2,4</sup>

**Cordyceps** may well be one of the most therapeutically active medical plants in Chinese medicine. Also known as Dong Chong Xia Cao, cordyceps is an ancient Chinese tonic herb that has been used as a traditional medicine to combat fatigue, enhance vitality, and promote longevity—it has a warm, sweet flavor and is used as a tonic, astringent, expectorant, anti-asthmatic, and sedative. Cordyceps is a rare and highly-prized edible fungus (mushroom) that, in the wild, grows on the larvae of certain caterpillar, hence the common name "Chinese caterpillar fungus." Although once restricted for use exclusively in the emperor's palace, in the late 1970's, the Chinese government began an extensive research campaign to find alternate means of cultivating this highly-prized and now-protected herb.<sup>1-5</sup>

In China, cordyceps is regarded as nothing short of an anti-aging miracle. Chinese researchers report that older people feel stronger and more energetic after taking cordyceps. In support of such claims, scientific studies have found that cordyceps increases levels of naturally-produced antioxidants, including superoxide dismutase (SOD)—one of the body's most important and powerful antioxidants. Age-related decline in antioxidant levels is believed to be a strong link in the development of numerous diseases such as arthritis and heart disease, and in the aging process itself.<sup>2,3,5</sup>

According to Traditional Chinese medicine (TCM) dating back thousands of years and still in use today, cordyceps is specifically recommended for the treatment of debility following illness, fatigue, impotence, kidney disease, and upper respiratory tract disorders. Cordyceps focuses much of its action on the kidneys, which represent the site where *chi* (life energy) is "grasped." Although the lungs bring chi into the body, it is up to the kidneys to grasp it. In TCM, kidney problems are associated with respiratory ailments and chronic asthma. Thus, cordyceps is used to support the kidneys (tonifies kidney yang), and treat conditions stemming from weak kidney energy, including weak back and knees and impotence. In addition, cordyceps is recommended for lung problems (associated with kidney yang deficiency), especially if symptoms include chronic cough and cough with blood in the sputum. Cordyceps is also highly regarded as a tonic with properties similar to ginseng, especially immunostimulant activity.<sup>1-5</sup>

Cordyceps is regularly used in China today for treating bronchial inflammation and chronic bronchitis, pneumonia, pulmonary emphysema, and tuberculosis. Researchers have verified marked bronchodilatory activity, as well as the potentiation of epinephrine—a bronchodilator. Cordyceps' effectiveness in treating respiratory problems such as asthma may also be due to its ability to inhibit tracheal contractions and relax bronchial airways, as evidenced in a recent animal study. In addition, cordyceps is commonly recommended for debility, weakness and exhaustion, anemia, spontaneous perspiration and night sweats, and malignancies (in combination with other substances).<sup>2,3</sup>

An extensive review of preclinical in vitro and in vivo studies and clinical blinded or open-label trials to date, involving 2,000 individuals, has verified that cordyceps acts as an antioxidant, restores sexual function, supports the endocrine system, and provides anti-atherosclerotic, antisenescent (anti-aging), and hypolipidemic (blood-fat lowering) activity. Cordyceps has also been shown to have antibacterial, anti-tumor and immune-enhancing properties.<sup>2-4,6</sup>

TCM's view of cordyceps as a kidney tonic that supports and strengthens healthy function has been confirmed by scientific research. Studies show that cordyceps significantly promotes DNA synthesis in kidney cells, which is indicative of increased regeneration of damaged cells. Cordyceps has also been shown to have a regulative effect on cellular immunity and promote a high level of interleukin-1 (an immune system hormone that stimulates T-cell function) activity, which may explain the mushroom's experimental success and traditional use against kidney disease. (Individuals with chronic kidney disease typically exhibit suppressed T-cell function.) For example, a study of 51 patients with chronic kidney failure showed that those receiving 3-5 grams of *Cordyceps sinensis* daily experienced significant improvement in kidney function, as well as enhanced cellular immune function.

Furthermore, cordyceps demonstrates a protective effect on the kidneys, as confirmed by 2 different human trials. In both trials, individuals with healthy kidney function were given aminoglycoside antibiotics, which induce kidney toxicity. The groups receiving cordyceps showed fewer signs of toxicity, confirming cordyceps' protective effect.<sup>2,3,7-10</sup>

Although the idea of using cordyceps to restore sexual function is an ancient tradition among the Chinese, recent scientific studies have proven its effectiveness. Cordyceps has been shown to inhibit contractions of the corpus cavernosum of the penis—when the smooth muscles of the corpus cavernosum relax, blood is able to enter, producing an erection as the blood becomes trapped. In addition, a placebo-controlled clinical trial was conducted involving 243 male and female patients diagnosed with sexual hypofunction. Improvement or restored sexual activity was confirmed in 64% of those receiving cordyceps (330mg taken 3 times daily for 40 days). Cordyceps has also been found to help women experiencing menopausal symptoms, and has even been used to promote fertilization.<sup>2-4</sup>

Researchers have also found that cordyceps acts as a fortifying agent for the liver by improving liver function. In fact, cordyceps has demonstrated a short-term curative effect on hepatitis B. A clinical study of 33 individuals with chronic hepatitis B showed that treatment with cordyceps mycelia—the underground portion of the mushroom—improved liver function, increased plasma albumin, inhibited high gamma globulin, and adjusted body immunocompetence. Such results have promoted researchers to suggest that cordyceps be used as a treatment for individuals with chronic hepatitis B, for correcting protein metabolism and the inversion of albumin and globulin.<sup>2-4,11</sup>

The traditional use of cordyceps as a natural sedative may be due to its high tryptophan content. Japanese researchers have also identified several nucleic acids, particularly adenosine, which may contribute to the herb's calming activity. Adenosine, which occurs naturally in the body as a neurotransmitter, exhibits a direct relaxing effect on vascular smooth muscle and reduces the excitability of nerves. However, cordyceps may owe its sedative effect, at least in part, to the inhibition of monoamine oxidase (MAO)—an effect which has been confirmed in animal studies.<sup>2,3,12,13</sup>

Cordyceps mycelial powder has been used in Chinese hospitals since 1984 for the treatment of arrhythmia. Several animal studies initially confirmed the antiarrhythmic effects of cordyceps, prompting researchers to conduct human clinical trials. A recent study involving 37 individuals with supraventricular or ventricular arrhythmia showed that over 50% were cured within three weeks of daily cordyceps use. Another study was performed, using 200 individuals with lengthy histories of arrhythmia, many of whom had also been diagnosed with coronary heart disease or with heart problems stemming from a previous viral infection. Plus, over 80% of the participants had taken prescription medications for arrhythmia with no success. After 14 days of treatment, 74.5% of those receiving cordyceps (500mg three times daily) experienced effective results with no side effects, while only 26.3% of participants in the control group registered positive results. Researchers noted that adenosine and related compounds found in cordyceps may be responsible for this antiarrhythmic activity. Incidentally, adenosine was granted FDA approval in the U.S. in 1989 for the treatment of supraventricular arrhythmia.<sup>2,3,14</sup>

A large controlled clinical trial confirmed the significant cholesterol-lowering properties of cordyceps. A reduction in LDL cholesterol, total cholesterol and total glycerides, as well as a significant increase in HDL cholesterol was achieved in patients receiving 330mg of cordyceps mycelium three times daily for 60 days. Researchers also noted a lack of any serious side effects and the ability for safe long-term use.<sup>2,3</sup>

Additionally, Japanese researchers have found that cordyceps can dilate the aorta by as much as 40% under stress, enabling increased blood flow to muscles being pushed to their limits, thus causing a significant improvement in endurance. In fact, cordyceps has been shown to effectively increase stamina and ability during exercise and to dramatically enhance energy production, which explains its wide use among Chinese athletes. For example, a team of 9 Chinese female runners broke 9 world records at the 1993 Chinese National Games in Beijing—the runners gave credit to their rigorous training regimen and their use of cordyceps. Researchers believe that cordyceps enhances athletic performance by opening up the airways to allow more oxygen into the body. Since oxygen is essential for the body's production of energy, increasing available oxygen results in greater endurance.<sup>1-5</sup>

Furthermore, cordyceps is well known for its ability to stimulate immune function. Substances known as polysaccharides are primarily responsible for the mushroom's immunostimulant effects. Cordyceps polysaccharides have been found to stimulate macrophage and lymphocyte activity, as well as provide protection against damage from chemotherapy and radiation. Cordyceps also contains substances which demonstrate anti-tumor activity and the ability to stimulate antibody-forming cells immunoglobulins G and M—successful animal studies indicate the possible use of cordyceps as an anti-tumor agent in the treatment of lymphoma and other cancers.<sup>2,4,15-18</sup> In vitro studies show that cordyceps polysaccharides can significantly inhibit the proliferation of human leukemic cells by 78-83%.<sup>19</sup> In addition, in vitro and in vivo studies found that cordyceps stimulates the activity of NK (Natural Killer) cells, indicating its potential for use as an immunopotentiating agent in the treatment of cancer, including adult leukemia, and immunodeficient patients.<sup>2-4,20,21</sup>

Incidentally, decreased NK cell activity also occurs in Crohn's disease, multiple sclerosis, systemic lupus erythematosus, and is the most frequent immune abnormality exhibited in individuals with chronic fatigue syndrome (CFS). Furthermore, a clinical study of 36 individuals diagnosed with advanced breast and lung cancer showed that a pharmaceutical preparation providing similar active principles as found in *Cordyceps sinensis* restored cellular immunological function and improved the patients' quality of life.<sup>3,4,22</sup>

Cordyceps has been shown to be a safe supplement with very low toxicity, unless massive doses are taken. However, cordyceps is not recommended in cases where there is bleeding, or for individuals receiving immunosuppressant medications for bone grafts and organ transplants. In addition, cordyceps may potentiate the effects of some anticoagulant and heart medications, as well as epinephrine bronchodilators.<sup>3</sup>

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