

# **Astragalus (Astragalus Membranaceus Moench): A Powerful Daily Supplement For The Immune System**

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Astragalus has been used for at least 2000 years in China and continues to be widely used as a herb that is known to enhance function of the immune system and facilitates an increase in energy production within the heart muscle, in cases where certain forms of heart disease exist. <sup>(1,2,3,4,5,)</sup> It is one of the most widely used herbs in Fu-zheng therapy -- the use of herbs to augment the host defense mechanisms. <sup>(1,2,3,6)</sup> Astragalus is a herbaceous perennial with the root of the plant used for medicinal purposes. <sup>(7)</sup> The primary active ingredients within astragalus include triterpene glycosides such as astragalosides, polysaccharides such as astragalans and various flavonoids. <sup>(7,8,9,10,11)</sup>

## **Clinical Applications and Mechanism of Action**

### **1) Immune Function – (defending against the common cold and minimizing the effects of chemotherapy and radiation treatment)**

Astragalus is used as an immune stimulant to treat and help prevent the common cold. <sup>(4,8)</sup> It has also been used to reduce the side effects of chemotherapy and radiation treatment in human studies. A large clinical study of 572 cancer patients demonstrated that astragalus supplementation was able to protect adrenal cortical function during radiation and chemotherapy treatment. It also helped to greatly minimize bone marrow depression and gastrointestinal side effects, such as nausea, vomiting and intestinal tract ulcerations in these patients. <sup>(6)</sup>

In patients with very low white blood cell counts, as a side effect of drugs, radiation or chemotherapy, astragalus supplementation has been shown to help significantly increase the number of circulating white blood cells, helping to restore normal function of the immune system in these severely immune-compromised patients. <sup>(12)</sup>

The biological activity that can account for these outcomes is related to the active constituents in astragalus, primarily its triperpene glycosides and polysaccharide content, which have been shown to:

- a. significantly increase the proliferation of lymphocytes <sup>(3,12)</sup>
- b. enhance interferon and interleukin-2 production and activity (two powerful signalling agents that enhance the effectiveness of immune cells) <sup>(13,14,15,16)</sup>
- c. activate T cell blastogenesis <sup>(17)</sup>
- d. increase T cell cytotoxicity <sup>(2,17)</sup>
- e. enhance the secretion of the immune modifying chemical known as tumor necrosis factor (TNF) <sup>(9)</sup>
- f. enhance phagocytosis by immune cells <sup>(18)</sup>
- g. increase natural killer cell cytotoxicity (the ability of these white blood cells to destroy developing cancer cells, viruses and other pathogens) <sup>(17,19)</sup>
- h. increase the activity of peritoneal macrophages <sup>(18)</sup>
- i. provide direct anti-viral effects <sup>(20,21,22,23)</sup>

## **2) Congestive Heart Failure and Angina Pectoris**

The active constituents of astragalus appear to provide an inotropic effect on the heart muscle, in a similar manner to hawthorn. An inotropic effect implies that these active ingredients in some way enhance the ability of the heart muscle to synthesize ATP energy, which is required for heart muscle contraction. In congestive heart failure the heart muscle becomes weak, partly due to insufficient ATP production, and preliminary evidence suggests that astragalus may help to improve these cases. Thus far, two small clinical trials have shown that patients with congestive heart failure demonstrate improvement in chest distress, dyspnea (shortness of breath), exercise tolerance and other parameters of cardiac function, when given astragalus intravenously. <sup>(10,24)</sup>

Astragalus has also been used effectively in patients suffering from ischemic heart disease <sup>(25)</sup> and it has been shown to increase cardiac output in 20 patients with angina pectoris. <sup>(26)</sup>

## **3) Anti-Cancer Effects**

The immune- enhancing effects of astragalus make this herb an interesting compound in terms of its potential in cancer treatment. A clinical study of 54 patients with small cell lung cancer were treated with regular medical interventions plus Traditional Chinese Medicine (including astragalus). Increased survival was noted in comparison to the average survival statistics of conventional medicine alone. <sup>(27)</sup>

Animal studies demonstrate quite strongly that astragalus has potential to prevent some cancers and has curative potential in others (e.g., renal cell carcinoma model in mice). <sup>(28,29)</sup>

Intensive research continues in an attempt to establish the true anti-tumor potential of astragalus.

## **4) Male Fertility**

Astragalus has been shown to significantly increase the motility of human sperm in vitro. <sup>(30)</sup> This may be of value in the treatment of male infertility where poor sperm motility is a suspected factor. Note that L-carnitine and zinc supplementation have demonstrated similar capabilities (see details in compendium under their individual headings).

## **Dosage and Standardized Grade (2:1 powdered extract)**

- 1) Common Cold – for general prevention consider 100-200 mg per day. During the preliminary stages of a cold consider up to 500 mg, three times daily if used as single agent <sup>(31)</sup>
- 2) Radiation Treatment, Chemotherapy – consider up to 500 mg, three times per day if taken as a single agent. (Consider combining astragalus with reishi mushroom extract) to minimize side effects. (Requires attending physician's approval)
- 3) Congestive Heart Failure, Angina Pectoris and Ischemic Heart Disease – no oral dose values have been established
- 4) Decreased Sperm Motility Causing Infertility – dosage not established, however taking up to 500 mg, three times daily is considered to be safe.

### **Adverse Side Effects and Toxicity**

There are no reported side effects or toxicity for the use of astragalus at recommended doses. <sup>(31)</sup>

### **Drug-Nutrient Interactions**

- Immunosuppressive Medications – as astragalus has been shown to enhance immune function, it may counter the efficacy of immunosuppressive drugs. <sup>(32, 33)</sup>

### **Summary**

Astragalus is most strongly emerging as a dietary supplement that has been shown to boost immune function in subjects with immune-compromised states, including cancer patients and other conditions of poor immune function. As the body's immune system is known to slowly weaken as we age, it may be wise to introduce the daily supplementation of astragalus, along with other immune-enhancing supplements (e.g., antioxidants, zinc and reishi mushroom extract) to help preserve and optimize immune function throughout our lifetime. The dramatic rise in cancer incidence that accompanies aging and the greater vulnerability to the life-threatening effects of pneumonia and other infections that produce more serious consequences in older age, are largely related to the age-related decline in immune function. As such, holistically-minded practitioners should interest their patients in proactive strategies to keep the immune system strong and able to kill off developing cancer cells, pathogens and other foreign microbes that may pose a threat to human health. In my view, the combination of astragalus and reishi mushroom extract is the perfect one-two herbal combination to help accomplish this goal. Astragalus has a long history of use in Oriental Medicine and its safety profile is well established.

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