

# The protect the body from foreign pathogens

[Parts of the World, Asia](#)



The immunesystem is an intricate and complex defense system that functions to protect thebody from foreign pathogens that seek to invade and cause harm to the body. Although the immune system is able to defend and destroy the majority offoreign invaders, there are some pathogens that are able to evade the immuneresponse and penetrate the defense system. Therefore, in order to compensatefor the immune systems' flaws, there are alternative measures that can be takento aid the immune response. Additional measures include the use ofsupplementary dietary ingredients which can be utilized to enhance the immuneresponse and serve as an added protection in cases of a weakened immune systemor sneaky invaders. There are various dietary ingredients that containproperties that are useful in boosting the immune response.

Dietary ingredientsare defined as “ a vitamin, a mineral, an herb or other botanical, an aminoacid, a dietary substance for use by man to supplement the diet by increasingthe total daily intake, or a concentrate, metabolite, constituent, extract, orcombinations of these ingredients” (Kalra, 2003). Therefore, dietaryingredients encompass a wide spectrum of supplements that have the capabilityof producing a positive impact on the immune system's response. Although thereare many dietary ingredients that can be used to produce effects on the immuneresponse, some ingredients that are recognized as having a particular impact onthe immune system include Echinaceaand Ginseng.

Herbs                      The use of herbal therapy or phytomedicine has been a long standing practice that has been thought to have the power to bring abouthealing capabilities (Block & Mead, 2003). This method has gained <https://assignbuster.com/the-protect-the-body-from-foreign-pathogens/>

momentum in modern medicine as a form of complementary medicine (Block & Mead, 2003). Among some of the herbal agents that are used to stimulate the body's disease-fighting mechanisms, Echinacea and Ginseng are the most widely used (Block & Mead, 2003). Herbal remedies that bring about effects on the immune system are classified as either adaptogens or immunostimulants. Adaptogens are defined as "substances that are reputed to increase the body's resistance to physical, chemical, and biological stressors" (Block & Mead, 2003). On the other hand, immunostimulants "are agents that activate the body's nonspecific defense mechanisms against infectious organisms (notably viral and bacterial pathogens) or against neoplastic cells" (Block & Mead, 2003). The purpose of immunotherapy is primarily to activate immunologic cell activity that interact directly with infectious agents or neoplastic cells (Block & Mead, 2003).

It is believed that herbal immunostimulants may "help rectify the moderately compromised cell-mediated immune response", but have only a slight impact on the normal immune response (Block & Mead, 2003). Most herbal agents have been found to enhance innate immunity, which is the first line of defense that is not intrinsically affected by prior contact with an antigen. Herbal agents have been found to produce effects on cell-mediated immunity by producing changes in the "natural killer (NK) cell number and activity, lymphokine-activated killer (LAK) cell activity, macrophage activity, phagocytic activity, and proliferation of specific T-lymphocyte subsets" (Block & Mead, 2003). It has also been found that herbal agents also seem to have an effect on acquired immunity (Block, 2003). Herbal agents have been found to produce effects on acquired immunity by producing changes in

“ mitogenic effects on B lymphocytes (increased proliferation) and production of specific types of antibodies” (Block , 2003). There is evidence that suggests herbal agents have the ability to manipulate the natural immune mechanisms to inhibit the progression and development of some neoplastic and infectious diseases (Block & Mead, 2003).

Herbal supplements can also be used as a complement to cancer treatments because of their immune stimulating capabilities. Herbal supplements for cancer patients may have the potential to protect cancer patients from contracting illnesses such as community-acquired respiratory viruses when their immune system is weakened from chemotherapy (Block & Mead, 2003). Therefore, herbal agents are of strong relevance to the overall health and survival of immunocompromised patients (Block & Mead, 2003).

Echinacea                      Some of the more widely used herbal immunostimulants lie under the genus, Echinacea (Block & Mead, 2003). The three species that are commonly used for medicinal purposes include: Echinacea purpurea, Echinacea angustifolia, and Echinacea pallida (Block & Mead, 2003). The herb is native to North America, where Native Americans were the first to discover its' healing qualities and then echinacea was later used by the white colonists (Block & Mead, 2003). Echinacea is commonly known as a “ cold fighter” because of its' effectiveness against upper respiratory infections (Block , 2003). However, it can also be useful in the treatment of “ infections with Candida albicans and Listeria monocytogenes, chronic pelvic infections, chronic fatigue syndrome, herpes infections, cancer, chronic arthritis, and a variety of skin diseases, wounds, and ulcers” (Block ,

2003). Although echinacea has been found to contain useful healing properties, the three species contain a variety of phytochemicals that are difficult to prepare and produce the same results consistently (Block & Mead, 2003). This lack of understanding about the chemical mechanisms of echinacea will continue to limit the accuracy of treating specific medical conditions (Block & Mead, 2003).

However, it is claimed that echinacea produces effects on the immune system by enhancing "phagocytic activity, macrophage activation, and NK cell activity" (Block & Mead, 2003). The echinacea constituents reported to produce immunologic effects include: polysaccharides, glycoproteins, alkaloids, and cichoric acid (Block & Mead, 2003). It was found that *E. purpurea* purified polysaccharides "induce macrophage activation and increase phagocytic activity in vitro and in vivo in mice" (Block & Mead, 2003). Increased immune function suggests that the immune effects "could be mediated by increased monocyte secretion of several cytokines, including tumor necrosis factor-alpha as well as interleukins 1, 6, and 10" (Block & Mead, 2003). In some preclinical trials, *E.*

*angustifolia* was found to inhibit "the infiltration of inflammatory leukocytes and reduced edema" (Block, 2003). *E. purpurea* produced effects that increased the number of NK cells significantly and stimulated "the classical and alternative pathways of complement activation" (Block & Mead, 2003). Treatments with *E. angustifolia* produced an increase in the antibody, immunoglobulin G (IgG) (Block & Mead, 2003). These findings suggest that echinacea's primary mechanism may be its' effects on cell-mediated

immunity (Block & Mead, 2003). Echinacea usage for cancer patients prior to chemotherapy in one clinical trial resulted in a dramatic increase in leukocyte number two weeks after chemotherapy was administered (Block & Mead, 2003). However, it was observed that there was “no impact on phagocytic activity or lymphocyte subpopulations” (Block & Mead, 2003).

*E. purpurea* may be best known for its popularity in reducing the symptoms of upper respiratory tract infections (Block & Mead, 2003). *E. purpurea* fluid extracts are most commonly used in the treatment of upper respiratory infections, but its effectiveness is still inconclusive (Block & Mead, 2003). Even though the clinical trials that have been run to test the effectiveness of Echinacea have been modest in quality, it can be concluded that there is evidence that Echinacea is effective for treating URIs (Block & Mead, 2003).

Some of the many immunomodulatory benefits that have been cited include “phagocytic leukocyte and NK cell activation, macrophage activation, and changes in number and activity of T- and B-cell leukocytes” (Block & Mead, 2003). Ginseng is another type of herb that is dominant amongst the wide variety of herbs used in phytomedicine. Ginseng “is a slow-growing root herb that has been used medicinally for more than 3000 years by practitioners of traditional Chinese medicine” (Block & Mead, 2003). Ginseng is highly regarded and researched in Asia and is regarded as an adaptogen and an immunostimulant (Block & Mead, 2003). There are three commonly used species that are referred to as ginseng, they include: *Panax ginseng*, *Panax quinquefolius*, and *Eleutherococcus senticosus* (Block & Mead, 2003). *Panax ginseng* is the predominant and the most well

researched ginseng species. The main immunemechanisms of *P. ginseng* include:” immunostimulation, increased antitumor activity, improved cardiovascularfunction (vasodilation, and reduced platelet aggregation), antioxidant activity(increased oxygen radical scavenging and decreased lipid peroxidation), hypoglycemic activity, and stimulation of the pituitary-adrenocortical system(steroidal effect)” (Block & Mead, 2003).

Ginseng’s main active componentsare “ glycosidal saponins (glycosylated steroids) known as ginsenosides” (Block& Mead, 2003). Ginsenosides can act as protectors of the cell’s outermembranes, much like antioxidants, mainly for immune and nerve cells (Block& Mead, 2003). In laboratory and human studies, antioxidant micronutrientshave been shown to enhance immune function (Block & Mead, 2003). It wasdiscovered that ginseng in vitro, stimulated macrophage activation to initiate the production of reactive nitrogen intermediates in order to attack and killtumors (Block & Mead, 2003). In athymic rats, it was found that ginsenginincreased resistance against *Pseudomonasaeruginosa* pneumonia which is “ virtually impossible to treat withantibiotics” and caused changes in IgM, lung IL-4, IFN-?, and TNF-? (Block& Mead, 2003). There are also differences between extracts of wild *Panax ginseng* and cultured *Panax ginseng* (Block & Mead, 2003). Research indicates that wild *Panax ginseng* stimulated lymphocyteproduction in vitro whereas cultured *Panaxginseng* did not (Block & Mead, 2003).

In other experiments, the fluvaccine was given to participants followed by Ginseng treatment. This method resulted in “ a highly significantreduction” of the frequency of upper respiratory infections (Block & Mead, 2003). In the

same experiment, it was also reported that NK activity “ was twice as high as the placebo group” (Block & Mead, 2003). Ginseng is also a promising complementary treatment to chemotherapy.

In one experiment, Shenmai (herbal combination containing ginseng), in addition to chemotherapy “ resulted in significantly increased T-cell and NK levels; a trend toward increased T-helper/T-suppressor ratios was also reported” (Block & Mead, 2003). Conclusion

The dietary ingredients Echinacea and Ginseng are some of the most well-known and studied dietary ingredients that serve to boost the immune response.

Echinacea has been reported to contain particularly valuable properties for treating upper respiratory infections. On the other hand, Ginseng is known as the “ heal all” tonic. Ginseng has been shown to reduce the frequency of respiratory infections, has shown promise in acting as a complementary treatment for cancer, and has been reported to increase T-cell and NK levels. All of which stimulate the immune response and lead to the eradication of the invading pathogens from the body.