

Immune System

**prevent illness and
improve your health**

While you're healthy, you probably don't give immunity a second thought. However, your immune system needs close attention. When you take steps to bolster immune function, you dramatically increase your ability to fend off disease. What happens when your immune system falters? You become much more susceptible to colds, flu, chronic infections, cancer, and a host of other ills. You can become more disease-resistant through healthful dietary choices, changing certain lifestyle habits, and using nutritional supplements as added insurance.

Explaining immune function

The immune system is made up of an army of organs, cells, and communications equipment that organize a sophisticated search-and-destroy mission. T-cells and B-cells communicate with killer, helper, and suppressor cells. Once the foreign substance is identified and disarmed, macrophages ("big eaters") devour it so the body can easily excrete it (Komaroff AL [ed]: *Harvard Medical School Family Health Guide*. New York: Simon & Schuster, 1999).

Unfortunately, when your immune system is overworked or weakened because of stress, poor nutrition, or toxic overload (exposure to smoke, pesticides, etc.), it can't keep up with the elimination of toxic or mutated cells.

There are two primary types of immune system disorders. Immunodeficiency diseases result from weakened immune function. Autoimmune diseases occur when the body's own immune system cells attack healthy cells, as in rheumatoid arthritis or lupus. We will briefly discuss autoimmune diseases later in this health report.

Diet and lifestyle

The biggest factors that influence your immune defenses are the choices you make every day. The following steps can give your immune function a fighting chance:

- Do not smoke;
- Increase your intake of colorful, organic fruits and vegetables;
- Eat regular meals;
- Maintain a healthy weight;
- Get enough sleep and relaxation time (individual needs vary);
- Exercise consistently;
- Adopt a high-fiber, low-fat diet; and
- Use nutritional supplements that support immune function.

Nutrients and herbs

Diet comes first. You can't eat a bag of chips for lunch, pop a tablet of vitamin C, and expect to stay healthy. However, when you add high-quality supplements to a wholesome diet, you may boost your immune function and protect against disease. Following are some of the key immune-supporting nutrients:

- **Vitamin A** is a powerful immune booster. A deficiency of vitamin A appears to damage some of the key components of the immune system: neutrophils (white blood cells), macrophages, and natural killer cells. In many areas of the world, higher mortality rates are seen in vitamin A-deficient infants, young children, and pregnant women (Stephensen CB: Vitamin A, infection, and immune function. *Annu Rev Nutr* 21:167-192, 2001). Recommended daily doses are 1,000 mcg for men and 800 mcg for non-pregnant women (Ronzio A: *The Encyclopedia of Nutrition & Good Health*, 1997).

NOTE: High doses of vitamin A are contraindicated in pregnant women and those who may become pregnant; a carotene complex in combination with a broad range of other antioxidants may provide the benefits of vitamin A, without the risk.

- **Zinc** deficiency and impaired immunity are both common among the elderly. Zinc supplementation for one to two months may enhance longevity in this population (Mocchegiani E, *et al*: Zinc, infections and immunosenescence. *Mech Ageing Dev* 121[1-3]:21-35, December 20, 2000). Recommended dietary allowance is 15 mg daily for men and 12 mg daily for women.

- **Vitamins C and E** promote resistance to oxidative stress. Oxidative stress releases a flood of free radicals, rogue molecules that destroy healthy cells. Free radicals are implicated in cancer, atherosclerosis (hardening of the arteries), high blood pressure, cataracts, arthritis, and Alzheimer's disease. The authors of one study concluded that supplementing the diet with vitamins C and E, as well as vitamin A, is associated with improved antioxidant defenses. That means that the body can better resist oxidative stress and the scourge of rampant free radicals (Preiser JC, *et al*: Enteral feeding with a solution enriched with antioxidant vitamins A, C, and E enhances the resistance to oxidative stress. *Crit Care Med* 28[12]:3828-3832, December 2000). Recommended daily dose ranges from 500 to 1,000 mg of vitamin C and 400 to 800 IU of vitamin E.

- Carotenoids are the biologically active natural pigments found in red and yellow vegetables. The most well-known is beta carotene, however, more than 600 of these compounds have been identified. Other highly researched carotenoids include lycopene and lutein. According to author Michael Murray, N.D., immune-enhancing effects of carotenoids dates back to the 1930s, however, recent studies have also confirmed the immune-enhancing effects of these natural substances.

- **Coenzyme Q10** is found in almost every living cell, especially in the cells' mitochondria (i.e., "energy factories"). The combination of CoQ10 and vitamin B₆ appear to increase certain lymphocytes, important components of the immune system. The authors of one study concluded, "These increases in IgG and T4-lymphocytes with CoQ10 and vitamin B₆ are clinically important for trials on AIDS, other infectious diseases, and on cancer" (Folkers K, *et al*: The activities of coenzyme 10 and vitamin B₆ for immune responses. *Biochem Biophys Res Commun* 193[1]:88-92, May 1993). Physician and author Ray Sahelian, M.D., suggests starting at 10 mg daily and building up gradually, as needed (Sahelian R: *Coenzyme Q10: Nature's Heart Energizer*. Green Bay: IMPAKT Communications, Inc., 1997).

- **Inositol hexaphosphate**, also known as IP6, is a nutraceutical related to inositol, a B vitamin. It appears to help the body resist cancer. In animal studies, mice with mammary tumors were given IP6. Other mice with mammary tumors were given a high-fiber diet. The IP6 mice showed a significant reduction in tumor number, incidence, and multiplicity, compared to the high-fiber group of mice (Shamsuddin AM, *et*

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al: Mammary tumor inhibition by IP6: a review. *Anticancer Res* 19[5A]:3671-3674, September/October 1994). Recommended daily dose is 3,000 to 5,000 mg.

- **Iron** is essential for the white blood cells (neutrophils) that kill bacteria. The daily recommended dietary allowance is 10 mg for men and 15 mg for premenopausal women. Supplemental iron may not be appropriate for postmenopausal women.
- **Folic acid**, a B vitamin, fuels immune function and may reduce the risk of some cancers. Folic acid, along with zinc, selenium, iron, copper, beta-carotene, and vitamins A, C, and D, defend against infectious agents (Erickson KL, *et al*: Micronutrients and innate immunity. *J Infect Dis* 182[Suppl 1]:S5-S10, September 2000). The daily recommended dietary allowance for folic acid is 200 mcg for men and 180 mcg for women. For women of child-bearing age, 400 mcg daily is recommended.
- **Selenium** stimulates antibody production and lymphocytes, macrophages, and natural killer cells. The daily recommended dietary allowance for selenium is 50 mcg to 200 mcg.

Plant medicines can also bolster resistance to illness. Just as certain nutrients can give your immune system a boost, so can herbal extracts. Appropriate doses are listed on bottle labels. If you want to strengthen your immune system, consider the following herbs:

- **Echinacea** (*Echinacea purpurea*) strengthens the immune system by stimulating phagocytic activity. This enables the immune system to engulf bacterial or viral matter and kill it

more efficiently. In one laboratory study, echinacea was added to the daily diet for either one or two weeks. Researchers found a significant increase in the number of the immune system's natural killer cells and monocytes in the bone marrow and the spleen. This occurred as early as one week after beginning treatment with echinacea (Sun LZ, *et al*: The American coneflower: a prophylactic role involving nonspecific immunity. *J Altern Complement Med* 5[5]:437-446, October 1999).

- **Elderberry** (*Sambucus nigra*) contains two compounds that are especially active against the flu virus. According to respected botanical expert James Duke, Ph.D., elderberry also “stimulates the immune system and has shown some activity in preliminary trials against other viruses, such as Epstein-Barr, herpes, and even HIV.”
- **Milk thistle** (*Silybum marianum*) is a well-known liver detoxifier. Silymarin—one of the active ingredients in milk thistle extract—helps the cells generate an antioxidant enzyme called glutathione. It also activates another antioxidant, superoxide dismutase, in red blood cells. An interesting study focused on the effect of milk thistle on dialysis patients. Dialysis typically leads to oxidative stress and depleted immune function. In this study, milk thistle increased macrophage activity and helped restore some of the functional capabilities of patients on dialysis (Tager M, *et al*: Restoration of the cellular thiol status of peritoneal macrophages from CAPD patients by the flavonoids silibinin and silymarin.

Free Radic Res 34[2]:137-151, February 2001).

- **Garlic** (*Allium sativum*) bolsters the immune system by increasing natural killer cells and the phagocytic activity of white blood cells. One study showed that aged garlic extract boosted the natural killer activities of spleen cells, as well as blocking the growth of certain cancers. The authors suggest that aged garlic extract is an effective immune modifier (Kyo E, *et al*: Immunomodulatory effects of aged garlic extract. *J Nutr* 131[3s]:1075S-1079S, March 2001).
- **Astragalus** (*Astragali radix*) appears to stimulate immune function by activating the human macrophage/monocyte cell line (Bedir E, *et al*: Immunostimulatory effects of cycloartane-type triterpene glycosides from astragalus species. *Biol Pharm Bull* 23[7]:834-837, July 2000).
- **Cat's claw** (*Uncaria tomentosa*) disarms destructive free radicals and increases lymphocyte counts. One clinical study involved four healthy adult males who took cat's claw daily. After six weeks, their white blood cell counts were significantly higher, and no toxicity was observed (Sheng Y, *et al*: Enhanced DNA repair, immune function and reduced toxicity of C-MED-100, a novel aqueous extract from *Uncaria tomentosa*. *J Ethnopharmacol* 69[2]: 115-126, February 2000).
- **Ginseng** (*Panax ginseng* or *Eleutherococcus senticosus*) appears to increase cellular immunity. An animal study in Denmark indicates that ginseng may protect against a

type of lung infection that often affects individuals with cystic fibrosis. Ginseng was found to activate certain immune responses (Song Z, *et al*: Effects of ginseng treatment on neutrophil chemiluminescence and immuno-globulin G subclasses in a rat model of chronic *Pseudomonas aeruginosa* pneumonia. *Clin Diagn Lab Immunol* 5[6]:882-887, November 1998).

- **Green tea** (*Camellia sinensis*) is an immune booster and free-radical fighter. An animal study in China demonstrated that green tea improved immune function and blocked tumor growth in mice with cancer (Zhu M, *et al*: Green tea and its major components ameliorate immune dysfunction in mice bearing Lewis lung carcinoma and treated with the carcinogen NNK. *Nutr Cancer* 35[1]:64-72).

- **Mushrooms** are herbal adaptogens that promote immune function and vitality. One study used a polysaccharide-peptide complex from Shiitake (*Lentinus edodes*) mushroom. It appeared to improve immune responses in human blood (Liu M, *et al*: Induction of immunostimulating cytokines by a new polysaccharide-peptide complex from culture mycelia of *Lentinus edodes*. *Immunopharmacology* 40[3]:187-198, November 1998).

Autoimmune diseases

The immune system is built to fight off foreign invaders, such as bacteria, viruses, and cancer. Autoimmune diseases occur when the immune system attacks healthy tissues. Examples of autoimmune diseases are allergies, rheumatoid arthritis, lupus, and multiple sclerosis. Women appear to be more susceptible to autoimmune dis-

orders than men. Essential fatty acids, gamma-linolenic acid, zinc, vitamin E, and vitamin C have been recommended for people with autoimmune diseases (Janson M: *The Vitamin Revolution in Health Care*. Greenville: Arcadia Press, 1996).

Support your immune system

If you enjoy great health, thank your immune function. Whether you're healthy or ailing, don't ignore it. Without your support, your immune system is unlikely to do its best work.

To fortify immune function and resist disease, adopt a balanced diet, healthy lifestyle, positive attitude, and consider taking high-quality dietary supplements and herbal extracts. By taking these steps, you're "pumping up" your immune function. The stronger it gets, the healthier you get.

COMPLIMENTS OF



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