

## Chapter 10

# NUTRITION THERAPY IMPROVES IMMUNE FUNCTIONS

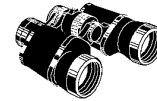


*"Every cell in your body is eavesdropping on your thoughts."*

*Deepak Chopra, MD*

### WHAT'S AHEAD?

Your immune system consists of 20 trillion specialized "warrior" cells in your body that are responsible for killing lethal invaders, such as cancer, yeast, bacteria, and virus. Breakdown in the immune system is at least partly responsible for cancer taking over a human body. There are many ways to get your immune system working:



- ↳ protein, calories, vitamins, minerals, amino acids, food extracts, fatty acids, and other nutrition components feed the immune system
- ↳ certain nutrition factors, such as enzymes, colostrum, cartilage, and medicinal mushrooms can help your immune system better recognize the cancer
- ↳ toxins and stress shut down the immune system
- ↳ sugar slows the immune system to a crawl

**I**magine being a special forces cop in downtown New York City. There are millions of people of all different sizes, shapes, colors, languages, manner of dress, and movement. Most are good people. Some are bad people. Some are terrorists with very evil intentions. Your job is to find the bad guys and get rid of them. No easy chore. That is what your immune system is trying to do in your body: recognize self from non-self. Good guys from bad guys. Workers from traitors. You have trillions of cells in your body of many different sizes, shapes, and various functions. Most are cooperative cells. Some are defective cells. A few are cancerous and could take over the body. Your immune system's job is to eliminate cancer.

**IMMUNOLOGY 101A**

**function:** recognize self from non-self  
 major histocompatibility complex (MHC) or  
 human leukocyte antigen (HLA in humans)  
 IMMUNE SURVEILLANCE IS CRITICAL

destruction via: phagocytosis  
 oxidative burst, membrane pen  
 enzymatic breakdown

**Mucosal/mechanical** (skin, membranes, tears)

**Lymphatic:** nodes, spleen, Peyer's patches (GI)

**Non-Specific:** phagocytosis, reticulo-endothelial, complement

**Specific:** produced in bone marrow

**Cell Mediated:** T-lymphocytes (killer, helper, suppressor)

**Humoral:** B-lymphocytes mature to antibodies  
 (immunoglobulin GAMED); react to antigens+complement

**Natural Killer cells:** from bone marrow

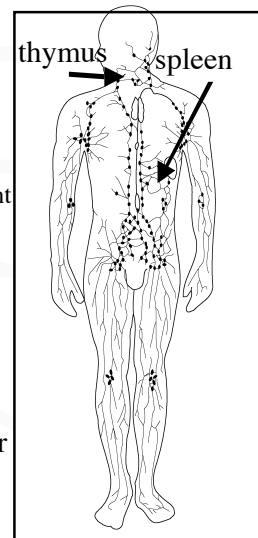
Cytokines (proteins) for communication

TNF, interferon, interleukin 1-6, colony stim. factor

40-50% of immune system surrounds GI tract

Bock, ROAD TO IMMUNITY, Pocket, NY 1997

Myrvik, MODERN NUTRITION, Lea, Phila, 1994



When the doctor says “We think we got it all,” what he or she is really saying is “We have destroyed all DETECTABLE cancer cells, and now it is up to your immune system to find and destroy the cancer cells that inevitably remain in your body.” A billion cancer cells are about the size of the page number at the top of this page. We must rely on the capabilities of the 20 trillion cells that compose an intact immune system to destroy the undetectable cancer cells that remain after medical therapy. There is an abundance of data linking nutrient intake to the quality and quantity of immune factors that fight cancer.<sup>1</sup>

The immune system of Americans is under serious attack by the forces of malnutrition, toxins, and stress. Cancer, drug-resistant infections, and auto-immune diseases (like arthritis and lupus) all conspire to make us sicker.

We have an extensive network of protective factors that circulate throughout our bodies to kill any bacteria, virus, yeast, or cancer cells. Think of these 20 trillion immune cells as both your Department of Defense and your waste disposal company. The immune system of the average American is “running on empty”. Causes for this problem include toxic burden, stress, no exercise, poor diet, unbridled use of antibiotics and vaccinations, inoculations from world travelers, and less breast feeding.

Most experts now agree to the “surveillance” theory of cancer. Cells in your body are duplicating all day every day at a blinding pace. This

process of growth is fraught with peril. When cells are not copied exactly as they should be, then an emergency call goes out to the immune system to find and destroy this abnormal saboteur cell. This process occurs frequently in most people throughout their lives. Fortunately, only 42% of Americans will actually develop detectable cancer, yet most experts agree that everyone gets cancer about six times per lifetime with one cancer cell sprouting up in everyone each day. It is the surveillance of an alert and capable immune system that defends most of us from cancer.

A healthy adult body includes around 60 trillion cells, of which nearly a third, or 20 trillion cells, are immune factors. Among the primary aspects of the immune system are:

- ⇒ **Birth place.** The bone marrow generates most immune cells, primarily in the long bones, especially the ribs.
- ⇒ **Maturation.** Bone immune cells (B-cells) move into the thymus gland for maturation and activation, and are then called “T” cells.
- ⇒ **Gastrointestinal (GI) tract.** 40% of the immune system surrounds the GI tract as lymph nodes, not only to absorb fat soluble nutrients (like essential fatty acids) and to protect against bacterial translocation (crossing of the intestinal barrier into the bloodstream by disease-causing bacteria), but also to stimulate the production of various immunoglobulins (IgA etc.) A healthy gut is a critical aspect of a healthy immune system.
- ⇒ **Filtering.** The immune cells move through the lymphatic ducts, not unlike the blood moving through the arteries and veins. Dead immune cells and invaders are filtered out of this “freeway” system in the spleen and lymph nodes.
- ⇒ **Quantity.** There are many factors that can influence the sheer numbers of immune warriors.
- ⇒ **Quality.** Not all immune cells have the same level of ferocity against an invading tumor cell. Some immune cells become confused about “who to shoot at” and end up creating an autoimmune response (often called an allergic response), which imbalances the immune system and detracts from the critical task of killing cancer cells. Some nutrients provide the immune warriors with a protective coating, like an asbestos suit, so that the immune cell is not destroyed in the process of killing a cancer cell with some “napalm”. Some nutrients provide the immune cells with more “napalm” or “bullets” in the form of granulocytes and nitric oxide.

Many nutrition factors affect the ability of the immune system to recognize and destroy cancer cells and invading bacteria. In the cancer patient, for a variety of reasons, the immune system has not done its work.

**We are going to bolster your immune army with improved:**

**-quantity** by producing more natural killer cells, tumor necrosis factor, lymphocytes, interleukin, and interferon.


**-quality** by:

1) reducing the ability of cancer cells to hide from the immune system. A healthy immune system will attack and destroy any cells that do not have the "secret pass code" of host DNA. Both the fetus and cancer are able to survive by creating a hormone, HCG, which allows the fetus to hide from the immune system. Tumor necrosis factor (TNF), which is specifically made by the immune system to kill cancer cells, is like a sword. TNF-inhibitor is produced in the presence of HCG and is like putting a sheath on the sword. Digestive enzymes and vitamins E and A help to clear away the deceiving "stealth" coating on the tumor and improve tumor recognition by the immune system.

2) providing antioxidants. We can put special shielding on the immune soldiers so that when they douse a cancer cell with deadly chemicals, the immune soldier is protected and can go on to kill other cancer cells. Otherwise, you seriously restrict the "bag limit" of any given immune soldier.

## IMMUNE SYSTEM

<ul style="list-style-type: none"> <li>• Enhanced by:</li> <li>• Vitamins: A, C, E, B-6</li> <li>• Minerals: Zn, Cr, Se</li> <li>• Quasi-vit: CoQ, EPA, GLA</li> <li>• Amino acids: arg, gluta</li> <li>• Herbals: astragalus, Cat's claw, Pau D'arco</li> <li>• Foods: yogurt, cartilage, garlic, enzymes, green leafy, shark oil, colostrum</li> <li>• Positive emotions: love</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced by:</li> <li>• Toxic metals: Cd, Pb, Hg</li> <li>• VOC: PCB, benzene</li> <li>• Sugar: glycemic index</li> <li>• Omega 3:6 ratio, 1:1; 1:16</li> <li>• Stress: depression</li> </ul>
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**>Deal with your allergies.**

Your immune system cannot fully direct its energies toward destroying cancer cells if it spends too much time mistakenly destroying your dinner. Food allergies are caused by food proteins being absorbed into

the bloodstream, then your immune system attacking the food as if it were an invading bacteria. Many food allergies can be caused by a leaky gut, which may be caused by yeast overgrowth. See the section on purging yeast or fungus from the body.

If nutrition itself is a controversial subject, then allergies represent controversy to the cubed power. From 25% to 50% of the population suffer from allergies, which can come from foods that we eat (ingestant), air particles that we breath (inhalant), or substances on our skin (contact). Allergies can cause an amazing array of diseases, including immune problems, arthritis, diabetes, heart disease, mental illness, and more. The reason allergies are so complicated to detect and treat is the limitless combinations of chemicals in the human body. You might react to wheat products only if you consume citrus at the same meal and are under stress. Otherwise, wheat may not create any problems. Some people have transient food allergies, that come and go along with the pollen seasons. Because of this trend, some allergists subscribe to the "rain barrel" theory, in which you only have allergic reactions when the rain barrel is overflowing, such as combined allergies with stress.

Allergies are generated by an over-reactive immune system or a porous digestive tract. What happens is that small undigested particles (polypeptides and peptides) of food pass through the intestinal wall into the blood stream and are recognized by the immune system as an invading bacteria (since its DNA is not yours). Now, you may be thinking that an over-reactive immune system should help to fight cancer, yet the immunoglobulins that instigate allergies will depress the production of cancer-killing immune factors, like natural killer cells and tumor necrosis factor. Allergies create an imbalanced immune system. Correct the allergies and you can re-establish a vigorous immune attack on the cancer.

Allergic reactions can be:

-Type 1. Immediate reaction of less than 2 hours. It is estimated that less than 15% of all food allergies are of this easily-detected type.

-Type 2. Delayed cytotoxic reaction which may require days to develop into subtle and internal symptoms. It is estimated that 75% of food allergies involve this category of cell destruction. The ELISA/ACT test detects type 2 delayed reactions.

-Type 3. Immune complex mediated reactions. In this reaction, a "wrestling match" goes on between the antigen (offending factor) and antibody (immune factor trying to protect the body), which can easily slip through the permeable blood vessels due to large amounts of histamine release.

-Type 4. T cell dependent reactions. Within 36-72 hours after exposure to the offending substance, inflammation is produced by stimulating T-cells.

Allergies are common, complex to diagnose, difficult to treat, and closely related to a variety of diseases, including cancer. A primitive and not terribly accurate way to find allergies involves the hypoallergenic diet. For 4 days, eat nothing but rice, apples, carrots, pears, lamb, turkey, olive, and black tea. If you find relief from any particular symptoms, then add back a new food every four days and record the results. The most common allergenic foods are milk, wheat, beef, eggs, corn, peanut, soybeans, chicken, fish, nuts, mollusks, and shellfish. Outside of humans, no other creature on earth consumes milk after weaning. Only 11-20% of Americans breast feed, which helps explain why the most allergenic food in the world is cow's milk.

Detecting and treating food allergies is a real challenge. The food rotation program basically states that you can only have a food once within a 4-day period, hoping that the body has time to reset the switch on your immune system and not create an allergic reaction. To resolve food allergies, work with your nutritionally oriented doctor listed in the appendix.

## **NUTRIENTS AFFECT THE IMMUNE SYSTEM**

There is an abundance of scientific documentation linking nutrient intake with immune quality and quantity. This is a very crucial issue for the cancer patient.

Many nutrients taken orally can provide pharmacological changes in immune function in humans. Protein, arginine, glutamine, omega-6 and omega-3 fats, iron, zinc, vitamins E, C, and A have all been proven to modulate immune functions.<sup>2</sup>

Vitamin A deficiency causes reduced lymphocyte response to antigens and mitogens, while beta-carotene supplements stimulate immune responses.<sup>3</sup>

There is extensive literature supporting the importance of vitamin B-6 on the immune system. In one study, B-6 supplements (50 mg/day) provided a measurable improvement in immune functions (T3 and T4 lymphocytes) for 11 healthy, well-fed older adults.<sup>4</sup>

Various B vitamins have been linked to the proper functioning of antibody response and cellular immunity.

Folate deficiency decreases mitogenesis.

Deficiency of vitamin C impairs phagocyte functions and cellular immunity.

Vitamin E deficiency decreases antibody response to T-dependent antigens, all of which gets worse with the addition of a selenium deficiency. In test animals, normal vitamin E intake was not adequate to optimize

immune functions.<sup>5</sup> Modest supplements of vitamin E have been shown to enhance the immune response.

While iron deficiency can blunt immune functions, iron excess can increase the risk for cancer.<sup>6</sup> Iron presents an interesting case: 1) because it is the most common nutritional problem worldwide, 2) because low levels of iron will depress the immune system, and 3) because high levels of iron will stimulate both bacterial and tumor growth. Iron intake needs to be well regulated...not too much, and not too little.

Zinc exerts a major influence on the immune system. Lymphocyte function is seriously depressed, and lymphoid tissues undergo general atrophy in zinc-deficient individuals. The lymphocytes in zinc-deficient animals quickly lose their killing abilities (cytotoxicity) and engulfing talents (phagocytosis) for tumor cells and bacteria. Natural killer cell and neutrophil activity is also reduced. All of these compromised immune activities elevate the risk for cancer.

Copper plays a key role in the production of superoxide dismutase and cytochrome systems in the mitochondria. Hence, a deficiency of copper is manifested in a depressed immune system, specifically reduced microbicidal activity of granulocytes.

Selenium works in conjunction with vitamin E to shield host cells from lipid peroxidation. Humoral immune response is depressed in selenium deficient animals. Selenium and vitamin E deficiencies lead to increased incidence of enteric lesions. Lymphocyte proliferation is reduced in selenium deficiency. The theory is that selenium and vitamin E help to provide the host immune cells with some type of "bullet-proof plating" against the toxins used on foreign cells. Hence, one immune body can live on to destroy many invaders if enough vitamin E and selenium allow for these critical chemical shields.

In magnesium deficiency, all immunoglobulins (except IgE) are reduced, along with the number of antibody forming cells. Magnesium is crucial for lymphocyte growth (involvement in protein metabolism) and transformation in response to mitogens. Prolonged magnesium deficiency in animals leads to the development of lymphomas and leukemia.

Iodine plays an important role in the microbicidal activity of polymorphonuclear leukocytes. Activated neutrophils may use the conversion of iodide to iodine to generate free radicals for killing foreign invaders.

Boron is an interesting trace mineral, since it is now recognized for its role in preventing osteoporosis, yet is still not considered an essential mineral. Boron deficiency in chicks creates immune abnormalities like arthritis.

Toxic trace minerals, like cadmium, arsenic, and lead all blunt the immune system.

The quality and quantity of fat in the diet play a major role in dictating the health of the immune system. A deficiency of the essential fatty acid (linoleic acid) will lead to atrophy of lymphoid tissue and a depressed antibody response. And yet, excess intake of polyunsaturated fatty acids will also diminish T-cell immune responsiveness. Since fat directly affects prostaglandin pathways, and prostaglandins (depending on the pathway) can either depress or enhance immune function, fat intake is crucial in encouraging a healthy immune system. Oxidized cholesterol is highly immuno-suppressive. Cholesterol is less likely to oxidize while in the presence of antioxidants, like vitamin E, C, and beta-carotene.

**PATIENT PROFILE: REVERSING KIDNEY CANCER:** C.H. was diagnosed with renal cell carcinoma stage 4 that had spread to his liver and spleen. All 3 oncologists said that C.H. had less than 6 months to live with no chance of recovery. C.H.'s daughters gathered the information in this book to create a diet, supplement, and detoxification program. Within a few weeks, his pain was significantly less and his pain medications could be reduced. "The doctor was amazed and said the patient's tumors are shrinking and there has been no new tumor growth in 2 months." Six months after his initial diagnosis C.H. is in good spirits, out of pain, and has much less tumor burden than the beginning. "Thank you for writing your wonderful book." states the daughters who provided their father with his nutrition program.

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### ENDNOTES

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<sup>1</sup> Bendich, A, Chandra, RK (eds), Micronutrients and Immune Function, New York Academy of Sciences, 1990, p.587

<sup>2</sup> . Alexander, JW, et al., Critical Care Medicine, vol.18, p.S159, 1990

<sup>3</sup> Rhodes, J., and Oliver, S., Immunology, vol.40, p.467, 1980

<sup>4</sup> Talbott, MC, et al., American Journal of Clinical Nutrition, vol.46, p.659, 1987

<sup>5</sup> Bendich, A., et al., Journal of Nutrition, vol.116, p.675, 1986

<sup>6</sup> Cerutti, PA, Science, vol.227, p.375, 1985