



# IMAGE AWARENESS WELLNESS INSTITUTE

## Susceptibility to Infectious Disease

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October 2014

Volume 10: Issue 10

### INTRODUCTION

A careful look at the history of infectious disease suggests that *susceptibility* to viral and bacterial pathogens plays a key role in serious epidemics.

The Spanish flu began at military Camp Funston, Kansas in 1918. The photo below shows how the virus swept through the camp leaving havoc in its wake. Three waves of the disease swept around the world.

The Spanish flu of 1918 followed the malnutrition and deteriorated sanitary conditions following the first world war. This flu epidemic infected 500 million people or 28% of the world's population at the time. It is estimated that as many as one out of five people infected with the disease died.

It is generally agreed that the drop in infectious diseases from 1860-1970 was associated more closely with improved sanitation and nutrition than any medical measures such as immunizations.

Among the measures implemented which have reduced infectious diseases are improved working and housing conditions, fresh water supplies, garbage and sewerage collection systems, improved hygiene, use of antiseptics, and improved nutrition due to refrigeration and fresher produce.

Dramatic reductions in a number of infectious diseases are obvious long before treatments were available. In-

fectious diseases virtually eliminated prior to the introduction of medical treatments include measles, whooping cough, scarlet fever, tuberculosis, typhoid fever, and diphtheria.

This newsletter will focus on some of the nutritional factors associated with decreased risk from infectious diseases such as the flu and ebola.

#### REFERENCES:

Sharpe, Robert, *The Cruel Deception*, Wellingborough, U.K.: Thorsons Publishing Group, 1988.

<http://upload.wikimedia.org/wikipedia/commons/3/38/CampFunstonKS-InfluenzaHospital.jpg>

### SELENIUM

The Spanish flu was characterized by very severe pneumonia. An army physician at the time wrote, "These men start with what appears to be an ordinary attack of La Grippe or Influenza,

and when brought to the hospital they very rapidly develop the most vicious type of pneumonia that has ever been seen. Two hours after admission they have the mahogany spots over the cheek bones, and a few hours later you can begin to see the cyanosis extending from their ears and spreading all over the face, until it is hard to distinguish the colored men from the white. It is only a matter of a few hours then until death comes, and it is simply a struggle for air until they suffocate. It is horrible."

Deficiency is selenium alone provides an illustration of the harmful effects lack of a single nutrient can create with regard to immune function. In an elegant study by Beck and associates mice were infected with a mild strain of the flu. Selenium defi-





cient mice developed much more severe pneumonia symptoms than mice supplied with adequate quantities of the nutrient.

Selenium is an essential trace element which plays a key part in the antioxidant enzyme glutathione peroxidase. Deficiency of selenium along with a viral infection is believed to be a key factor in a disease called Keshan characterized by death of heart tissue.

The yearly 20,000 or so deaths in the United States from the flu affect primarily the elderly and those with heart and lung difficulties. Many of these individuals may already suffer with selenium deficiency.

In Beck's experiment selenium deficiency was created by a dietary shortage for four weeks. Mice on a diet adequate in selenium reached a peak of lung disease six days after infection. The infection then rapidly diminished. By contrast, selenium deficient animals still evidenced severe lung disease even at 21 days after the infection.

An explosion of immune activity called a "cytokine storm" which is associated with severe inflammation and free radical damage has been suggested as a cause for the 1918 flu. Selenium appeared to reduce this type of immune activity in Beck's experiment.

Selenium deficiency resulted in not only more flu viruses, but also an increase in the mutation of the virus into a more lethal form. The more lethal form of the virus threatened even

the healthier selenium-adequate individuals.

Dr. Harold D. Foster believed that AIDS was associated with deficiencies of selenium, cysteine, glutamine, and tryptophan. Foster studied geology and geography. He noted that AIDS arose in selenium deficient areas of Africa.

Foster may have not been so far off the mark. Researchers have learned that HIV patients improve with selenium supplementation. The virus requires selenium and spreads rapidly through the body in search of the mineral when it is deficient. A selenium deficiency state then results leading to a failure of the functioning of the immune system. Ebola seeks out selenium ten times more avidly than does the HIV virus.

#### Selenium Summary

Emerging epidemics like the flu, ebola, and AIDS frequently appear in geographical areas characterized by a deficiency of selenium in the soil. Viruses like AIDS and ebola are ravenous in their search for selenium.

In selenium deficiency states these viruses spread through the body more rapidly and become more deadly.

The rapid depletion of selenium leads to loss of ability to produce the selenium dependent antioxidant enzyme glutathione peroxidase impairing the ability to fight infections.

Selenium supplementation slows the spread of selenium dependent viruses and decreases the virulence giving the body's immune system a chance to overcome the virus.

#### REFERENCES:

Beck, Melinda, A., et al., Selenium deficiency increases the pathology of an influenza virus infection, *The FASEB Journal*, April 27, 2001.

Quinn, T., *Flu: A Social History of Influenza*, London: New Holland Publishers (UK) Ltd., 2008, 128-129.

<http://www.hdfoster.com/what-really-causes-aids>

[http://www.drpasswater.com/nutrition\\_library/selenium\\_aids.html](http://www.drpasswater.com/nutrition_library/selenium_aids.html)

## VITAMIN D

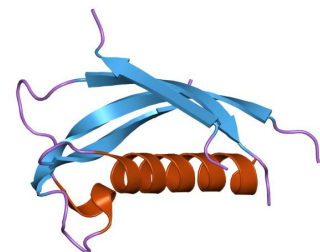
I was first made aware of the anti-microbial properties of vitamin D when Dr. John Cannell described an incident which took place in the mental hospital where he worked as a psychiatrist. He placed all of the patients under his care on supplements of vitamin D because they were all confined indoors and invariably developed a deficiency of the vitamin.

In April of 2005 a flu epidemic began in the hospital and spread throughout the institution. Cannell's patients were mixed with the patients who became ill, yet not one of his patients developed fever or the painful muscle aches characteristic of the flu.

In July of 2005 an article by Adrian Gombart clarified the immune enhancing properties of vitamin D. Vitamin D activates a powerful antimicrobial peptide called cathelicidin which helps the body fight off fungi, bacteria, and viral attack.

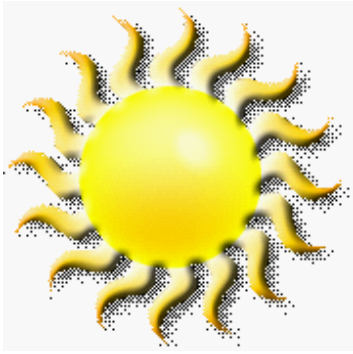
Cathelicidin is one of the munitions stored up in the body's white blood cells. It is used to punch holes in the external membranes of disease causing microbes making their inwards to spill out. Cathelicidin is one of the most potent and effective weapons utilized by the immune system to ward off infection. The compound is particularly important in warding off invasion by cold and flu viruses.

John White of McGill University in Montreal observed, "When the researchers administered 1,25-D (the active form of vitamin D) to a variety of cells...the gene for making cathelicidin 'went boom! Its induction was



Cathelicidin





very, very strong.” Adrian Gombart of the University of California made a similar observation, “nothing turned on the cathelicidin gene to any degree except vitamin D. And it really turned that gene on—just cranked it up. I was completely surprised.”

#### REFERENCES:

Gombart, Adrian, et al., Human cathelicidin antimicrobial peptide (CAMP) gene is a direct target of the vitamin D receptor and is strongly up-regulated in myeloid cells by 1,25-dihydroxyvitamin D3, *The FASEB Journal*, 2005;19:1067-1077.

Raloff, Janet, The antibiotic vitamin, *Science News*, November 11, 2006;170:312-317.

[http://upload.wikimedia.org/wikipedia/commons/5/5f/PDB\\_1kwi\\_EBI.jpg](http://upload.wikimedia.org/wikipedia/commons/5/5f/PDB_1kwi_EBI.jpg) (Picture of cathelicidin molecule.)

## CAROTENOIDS

Vitamin A has been shown to reduce illness and death among children who have infectious diseases including measles in at least a dozen clinical trials. Vitamin A has a wide range of beneficial effects on immune function including improving the health of epithelial cells, increasing the ability of white blood cells to reproduce in response to microbial invaders and allergens, and enhancing the antibody response.

The immune system destroys invaders by two important means. Invaders can be eaten by immune cells. This process is called phagocytosis. Invaders can also be destroyed by weapons produced by the immune cells such as antibodies and protein complement. Vitamin A appears to enhance and potentiate both kinds of immune activity.

Carotenoids are the natural fat soluble coloring pigments found in fruits

and vegetables. They are responsible for the red, orange, and yellow colors we see in leaves in the fall. These substances also provide a valuable boost to the immune system.

Early studies noted that carotenoids enhanced immune function. It was suspected that this immune enhancement was a result of the conversion of the carotenoids to vitamin A. Subsequent studies have been done with carotenoids which can not be converted to vitamin A. These studies have shown that the carotenoids have powerful immune enhancing properties apart from their ability to be converted to vitamin A. Carotenoids without convertibility to vitamin A such as lutein, lycopene, astaxanthin and canthaxanthin have been shown to be as effective or more effective in their ability to enhance overall immune function than beta-carotene which can be converted to vitamin A.

A key study of a patented carotenoid supplement (Carotenoid Complex) by the U.S. Department of Agriculture scientists showed that carotenoid deficiencies seriously hamper immune function and supplementation with a patented product increased lymphocyte proliferation 37% in 20 days and increased natural killer cells by 21% in the same period of time.

#### REFERENCES:

Semba, Richard D., Vitamin A, immunity and infection, *Clinical Infectious Diseases*, 1994;19:489-499.

Ross, A. Catharine, Vitamin A status: Relationship to immunity and the antibody response, *PSEMB*, 1992;200:303-320.

Kramer, Tim R., and Buri, Betty J., Modulated mitogenic proliferative responsiveness of lymphocytes in whole-blood cultures after a low-carotene diet and mixed-carotenoid supplementation in women, *Am J Clin Nutr* 1997;65:871-5.

## ZINC

Zinc is a nutrient which is frequently deficient in the diet and is essential for proper functioning of vitamin A. Zinc deficiency can impair 5 aspects of immune response: recognition of invaders, activation of the immune system, proliferation of defenders,

efficiency in attacking invaders, and memory of how to defeat invaders should they reappear at a later date.

#### REFERENCES:

Chandra, Ranjit K., M.D. and McBean, Lois D., MS, RD, Zinc and Immunity, *Nutrition*, 1994;10(1)

## VITAMIN C

Zinc and vitamin C are among the most frequently deficient nutrients in populations which suffer from infectious diseases including children and the elderly. A combined use of the two nutrients has been shown to reduce the incidence and improve the outcome of pneumonia, malaria, and diarrhea infections. A number of trials have shown these two nutrients help combat respiratory tract infections.

A study of three controlled trials found a considerably lower incidence of pneumonia with vitamin C alone administering doses between 500 mg and 2,000 mg a day.

Vitamin C protects cells during the inflammatory process and it is found in large quantities in white blood cells—over ten times the levels of vitamin C found in the blood. Levels of vitamin C in the urine, white blood cells and in the blood become rapidly depleted during infections.

Vitamin C has a wide variety of beneficial effects on the functioning of the immune system including enhancement of antimicrobial activity, improving lymphocyte proliferation and chemotaxis (movement to the site of an infection by immune cells).

Hickey and Roberts have developed what they call the dynamic flow model for vitamin C functioning. This theory suggests that the half-life of





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vitamin C at higher levels of intake is only about 30 minutes. This means that a single large dose will only provide about 4-6 hours of protection during which blood levels are raised. A single large dose will provide only a fraction of the benefit of split or slow release doses of the vitamin.

### REFERENCES:

Wintergerst ES, Maggini S, Hornig DH, Immune-enhancing role of vitamin C and zinc and effect on clinical conditions, *Ann Nutr Metab.*, 2006; 50(2): 85-94.

Hemila, Harri, Vitamin C and infectious diseases, in *Vitamin C in Health and Disease*, Pack-er, Lester and Fuchs, Jurgen (eds.), 1997;Chapter 27:471-503.

Hickey, Steve, Ph.D., and Roberts, Hilary,, Ph.D., *The Science of Vitamin C*, Ebook: Lulu.com, 2004, p. 126-129.

### SYNERGISM

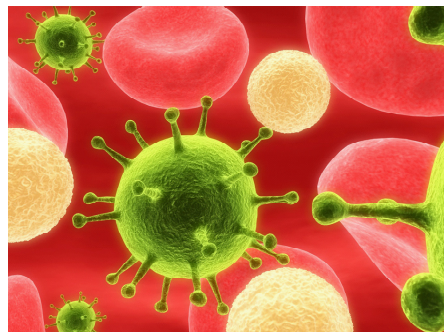
Combinations of antioxidants produce better results than individual nutrients. For example, physiologic doses of vitamins A (8,000 IU), C (100 mg) and E (50 mg) significantly improved immune function in elderly patients. In another study, Vitamin C (375 mg), E (288 mg), beta-carotene (12 mg), and zinc (15 mg) improved immune function in healthy individuals while bovine colostrum did not.

The concept of synergism is key to understanding how antioxidant

nutrients in particular enhance immune function and protect from inflammation and oxidative damage. One researcher writes, "The scheme the chemists propose works something like a bucket brigade, with the dangerous chemical property being passed from one molecule to the next. First, vitamin E reacts with the free radicals, restoring them to their less harmful state. This reaction, however, turns vitamin E into a potentially damaging free radical, which the carotenoids then inactivate. Finally, vitamin C repairs the resulting carotenoid radicals, and the water soluble vitamin C radicals eventually wash out of the body."

### REFERENCES:

Penn, N.D., et al, The effect of dietary supplementation with vitamins A, C and E on cell-mediated immune function in elderly long-stay patients: A randomized, controlled trial, *Age and Ageing*, 1991;20:169-174.



Wolvers DA, van Herpen-Broekmans WM, et al, Effect of a mixture of micronutrients, but not of bovine colostrum concentrate, on immune function parameters in healthy volunteers: a randomized placebo-controlled study, *Nutr J*, 2006; 21(5): 28.

W., C., "How antioxidants defend cells, *Science News*, Vol. 151, February 15, 1997, p. 111.

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