

## *Anti-Aging with Anti-Oxidants*

What on Earth is an Antioxidant? “It’s that stuff they put in body wash to make your skin look younger right?” “It’s the stuff in pomegranates and blueberries that helps you detox?”

While nearly every person over the age of eighteen has probably heard of antioxidants, a surprising few actually *know* what they are, why they are important, and even more rarely, how they actually *work*. The goal of this article is to, hopefully, answer those questions for you. I am quite confident that by the end of this article, you could win a bet or two, not to mention feel a little more ‘in the know.’

Since antioxidants are ANTI-oxidants, it is logical to ask, “What are oxidants?” Everyone knows that in order to survive, we need oxygen. Burning oxygen allows the cells in our bodies to continue functioning, much like a billion tiny engines humming along. Similar to all engines, there are byproducts to the chemical process. In cars this is the exhaust, in cells these byproducts are called *free radicals*. This is another term you may have come across. While ‘exhaust’ is one way of looking at it, the favorite analogy of medical professionals is the ‘rust’ analogy. Metals, when exposed to oxygen and other chemicals tend to form rust and weaken. Free radicals are similar to ‘rust’ in the body. Just like a rusty motor, every once and a while it needs a ‘good scrub’!

Unfortunately, this biological rusting is an unavoidable occurrence. As long as our bodies continue to need oxygen, there will be oxidative damage (rusting) as a result of free radicals. The good news is that our bodies do have a system for keeping these free

radicals in line. Our bodies have a number of available tools to use against these oxidative stress molecules, that’s right, antioxidants. A healthy body maintains a proper balance of free radicals to antioxidants. Free radicals are not 100% evil. Even though they destabilize and damage nearly every cell they contact, there are some cells you *want* them to destabilize, like germs, viruses and bacteria. There is obviously a limit to the sanitizing benefits of free radicals and that is the role of antioxidants, to keep the level of free radicals down to the minimum.

If everything is all ‘hunky dorry’ what is the big fuss about free radicals? Well, if our natural respiration were the only source of free radicals, everything might very well be ‘hunky dorry’ but the sad fact is that there are an enormous amount of environmental factors that either bring free radicals into the body or cause oxidative stress in the same manner, like cigarette smoke, car exhaust, pesticides and so on. These are the real culprits. These substances create an environment in your body where the free radicals outnumber the available anti-oxidants in your body and wreak havoc, chaos and mayhem like an army of terrorists who blindly and mercilessly destroy all in their path. Oh...you think that’s a joke?

Free radical oxidants damage fatty acids they encounter. Your brain, spinal cord and nerve fibers all contain fatty acids as a necessity for their function. Over time, free radicals oxidize these fats, a process called *lipid peroxidation*. This process has been directly linked to Alzheimer’s, Parkinson’s, ALS (Lou Gehrig’s Disease), and other degenerative nervous system disorders.

DNA, where the operating instructions and regulatory commands of the cell are stored, is itself a fatty acid. Oxidation of DNA is a known precursor to mutation, i.e. *cancer*.

Free radical damage to arteries, particularly those that directly supply the heart have been shown to dramatically increase the risk of atherosclerosis (hardening of the arteries) and heart attacks.

The effects of free radical damage are so broad and diverse, that in 1956, Denham Harman, Professor Emeritus at the University of Nebraska Medical Center through research conducted on mice, developed what is now called the Free Radical Theory of Aging, which asserts that aging itself is a manifestation of accumulated free radical oxidation in the body, particularly in the energy production centers of the cells, the mitochondria. Using antioxidants, he was able to consistently increase the average lifespan of mice, even those that had been exposed to radiation, further validating his theory.

So will taking additional antioxidants and supplements turn you into an immortal, like the Highlander TV show? Not yet, but they're working on it. In fact, anti-aging research through antioxidants is one of the most aggressively studied fields in medicine today and new discoveries are being made constantly.

Now that you have a firm grounding in the importance of bringing free radicals under control, it is time for you to meet the team. There are a number of effective antioxidants and they work together and support each other, like an elite counter-terrorism squad. They

circulate throughout the body hunting for culprits, and once found they almost literally obliterate them.

### *Vitamin C*

Ah, the world famous ascorbic acid. Ever since Nobel Prize winner Linus Pauling showed the world the incredible benefits large doses of vitamin C could have on medical conditions, this vitamin has become one of the leading antioxidants that provide incredible free radical protection to cells, particularly those in the brain. The antioxidant abilities of vitamin C are greatly improved when it is taken with *flavonoids*. Flavonoids are plant substances that have important antioxidant properties; many also have antitumor, antibacterial, antiviral, anti-inflammatory and antihistaminic properties as well. When combined with vitamin C, the antioxidant properties of both are dramatically amplified.

### *Vitamin E*

Vitamin E is a fat-soluble molecule that has been shown to effectively protect fatty acids, like those in nerve fibers, the brain and DNA, from oxidative damage. Epidemiological studies have shown that older individuals with high levels of vitamin E in their blood may be one third less likely to have memory problems. Vitamin E, also known as *tocopherol* comes in various forms, alpha-, beta-, gamma-, and delta-tocopherol, with alpha-tocopherol being the most active form.

### *Glutathione*

Glutathione has gained a lot of attention in the last few years. In some circles it is even referred to as the 'master detoxifier' because of its

relationship with the other antioxidants. Glutathione is made from three amino acids, cysteine, glutamate, and glycine, and forms part of the powerful natural antioxidant enzyme glutathione peroxidase (GP) which is found in the cells. This enzyme plays a number of roles in our cells, including the metabolism of toxins and carcinogens, the prevention of lipid peroxidation, DNA repair as well as basic immune system enhancement. What makes glutathione really special, however, is the fact that it helps the other antioxidants stay in their active form, almost like a medic on the battlefield keeping the troops patched up and able to continue the fight.

### ***NAC***

The acronym stands for N-Acetyl-Cysteine, which is technically an amino acid, but is a very powerful antioxidant in its own right. It is a free radical scavenger that also assists in the production of glutathione. Prescription drugs like acetaminophen (Tylenol) deplete the body's stores of glutathione (the body treats it as a toxin and uses glutathione to 'process' it). NAC helps to restore glutathione levels where taking glutathione orally may not necessarily allow it to reach.

### ***Selenium***

This trace mineral plays a very important role in the production and stimulation of glutathione peroxidase, one of the most important lines of defense against free radicals. The richest dietary sources of selenium are organ meats, seafood, meat, cereal products and dairy. As such, it is obviously better to supplement selenium to avoid mercury toxicity from seafood, and common food

allergies from dairy and cereal products, not to mention other health implications from the over consumption of meat.

By now it should be clear how all of these substances work and function in coordination with one another, i.e. NAC and Selenium supporting Glutathione, which in turn supports vitamin C and E. All of these antioxidants together provide the greatest protection and overall benefit from eradicating free radicals and even repairing the damage caused by them.

While taking antioxidants, both through diet and/or supplementation is a simple solution, each person's body is unique in form and function. It is not an uncommon occurrence for someone to have a genetic inhibitor to antioxidant function. There can even be degrees in which antioxidant production or use is impaired by genetic factors. The only way to know if these are present is through proper testing and consultation. It can be a waste of time, energy and even money to take antioxidant supplements in forms that your body is unable to fully utilize, if at all. Genetic testing is the best way to discover what your body's capabilities are as far as antioxidants. The results of such testing are a powerful tool for any consultant to enable them to provide you with the best advice on the proper dosages and forms of the various antioxidants.



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