

CellWise® Research Report



Antioxidants for Natural Cellular Protection

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In this report, we discuss how our bodies are constantly exposed to free radicals and how they interact with other molecules within the cell to cause oxidative stress which has been implicated in the cause of certain diseases and has an impact on the aging process.

We also take a look at the antioxidants in Melaleuca's **CellWise®** formula, which combines the power of mixed carotenoids and mixed tocopherols from whole foods. The formula also includes a proprietary blend of alpha lipoic acid, L-glutamine, green tea extract, cocoa extract, clove extract, blueberry powder, grape skin extract, rosemary power, and S-adenosyl-L-methionine (SAME). These ingredients combine to provide a safe healthy dose of broad-spectrum antioxidants for protection at the cellular level.

Many studies have indicated that **combinations** of antioxidant vitamins, carotenoids and flavonoids are believed to be more effective than supplementation with any of these nutrients alone.

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Accumulation of Free Radicals Causes Oxidative Stress

Free radicals are highly reactive molecules that are constantly produced as the body reacts with oxygen to create energy. When a free radical is produced, it then attacks the nearest stable molecule, causing it to become a free radical as well. This rapid chain reaction of free radicals causes disruption to the living cell, the cell wall, fats and proteins, and even the DNA nucleus of our cells. The free radical, in effect, steals nutrients from healthy cells, starving them to death. This is what makes free radicals so harmful. They actually attach themselves to other cells and cause damage, so we can't let them build up and later expect to consume antioxidants to neutralize them.(1)

The difference between an antioxidant and other molecules is that the antioxidant can neutralize free radicals, yet remain stable itself. We need an available supply of antioxidants in our bodies at all times, ready to neutralize the free radicals we are constantly exposed to. It is

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"Excellent! Thorough and informative. Thank you!" J.A.

"I just wanted to say

estimated that DNA receives about 10,000 hits per cell from free radicals per day.(2) By curbing the activity of free radicals with antioxidants, we can slow down the processes that cause disease and aging, and live a longer, healthier life.

The formation of some free radicals is a normal process in the body. For example, the body's immune system creates them to neutralize viruses and bacteria. For past generations, the body's own defense system of producing antioxidants was sufficient, but is not enough to fight the many free radicals we are exposed to in today's world. Environmental factors such as pollutants in the air we breathe, and in our food and water, dramatically increase the number of free radicals produced in our bodies. Stressful lifestyles, excessive exercise, radiation, cigarette smoke, pesticides, sunlight, poor nutrition and medications also greatly increase the number of free radicals multiplying in our bodies. When plenty of antioxidants are available to neutralize free radicals, the body can handle them, but when the production of free radicals becomes excessive, cells become damaged.

It is important to note that free radical damage begins at birth and accumulates with age, accelerating the aging process. Oxidative stress occurs when the body's supply of antioxidants is not sufficient to neutralize the adverse chemical reactions of free radicals. Hundreds of studies show that oxidative stress is the root cause of as many as sixty chronic degenerative diseases such as heart disease, diabetes, cancer, strokes, Alzheimer's, arthritis, macular degeneration, lupus, MS, fibromyalgia, and chronic fatigue.

1. [Foods with Antioxidants](#). eHow website.
2. [Susan Wallace Microbiology Research](#) Susan S. Wallace, PhD. University of Vermont

Potential Benefits of Antioxidants

Antioxidants are compounds that are naturally produced by the body for protection against harmful molecules we are exposed to every day. They stabilize free radicals by donating an electron to the free radical before it can damage other cell components, and at the same time, do not become free radicals themselves. Once the electrons of the free radical are paired, the free radical is stabilized and becomes non-toxic to cells. Antioxidants are also ingested, primarily as components of fruits and vegetables. Simply put, antioxidants protect our bodies from harmful molecules we are exposed to every day of our lives.

Evidence from scientific research and epidemiological studies show a multitude of potential benefits of antioxidants for neutralizing cell-damaging free radicals. Some of the benefits include help in the prevention of clogged arteries, greatly reducing the risk of cancer(3), aiding in the prevention of glaucoma and macular degeneration, reducing the risk of cholesterol oxidation, protection of the central nervous system, building a stronger immune system, prevention and treatment of cardiovascular disease(3,4), and helping to prevent or slow the progress of Alzheimer's and various other brain dysfunctions.(5)

3. [A review of the interaction among dietary antioxidants and reactive oxygen species](#). Seifried HE, Anderson DE, et al, *J Nutr Biochem*. 2007 Mar 13
4. [Antioxidant Vitamins and the Prevention of Coronary Heart Disease](#) *American Family Physician*. vol 60 num3 1999 Sept 1.
5. [Ways To Encourage Spinal Cord Regeneration After Injury](#). *The Society for Neuroscience*. Oct 2009

Carotenoids

thank you for the report and to let you know how helpful I found it. — A really useful newsletter! Thanks." D.H.

"A real gold mine of info." J.K.

"Thanks for your tireless pursuit of truth. It is a huge resource to us!!" P.L.

"I love this report, and the leads generated from it..." D.B.

Carotenoids are fat-soluble and are best known for their vitamin A activity, but additional roles include antioxidant activity, immune system support and skin health. They help protect other antioxidants such as vitamins E and C. About twenty carotenoids have been detected in the human body, but primarily beta-carotene, lutein, and lycopene.

Humans are unable to produce carotenoids, so they must be obtained from the diet. Many epidemiology studies suggest that fruits and vegetables rich in carotenoids promote total health. Good sources of carotenoid rich foods include carrots, sweet potatoes, spinach, broccoli, apricots and peaches.

A *Journal of Nutrition* article about the bioavailability of carotenoids shows that mixed carotenoids are more bioavailable than individual carotenoids. These findings suggest that a supplement of mixed carotenoids is more accessible to the body than taking a high dosage of individual carotenoids.(6)

Another study suggests that higher plasma levels of carotenoids, as markers of fruit and vegetable intake, are inversely related to risk of ischemic stroke and provide support for recommendations to consume fruits and vegetables regularly.(7)

An 18-month study of 573 middle-aged men and women was conducted by the University of California. Findings suggest that higher levels of plasma oxygenated carotenoids (lutein, zeaxanthin, beta-cryptoxanthin) and alpha-carotene may be protective against early atherosclerosis.(8)

6. [Dietary Factors That Affect the Bioavailability of Carotenoids](#) *Journal of Nutrition*. 2000;130:503-506.

7. [Prospective Study of Plasma Carotenoids and Tocopherols in Relation to Risk of Ischemic Stroke](#). *American Heart Association*. 2004 Jul;35(7):1584-8. Epub 2004 Jun 3.

8. [Progression of carotid intima-media thickness and plasma antioxidants: the Los Angeles Atherosclerosis Study](#). *Arterios. Thromb Vasc Biol*. 2004 Feb;24(2):313-9. Epub 2003 Dec 1

Mixed Tocopherols

Mixed tocopherol supplements contain not only the usual alpha tocopherol form of Vitamin E, but also contain the beta, delta, and gamma forms. Many vitamin E supplements consist primarily of alpha tocopherol. However, recent studies indicate that a mixture of tocopherols (alpha, beta, delta, and gamma) is needed to protect against degenerative disease. When taken together, the mixed tocopherols work synergistically to provide maximum benefits against oxidative stress.(9,10)

9. [Mixed tocopherols inhibit platelet aggregation in humans: potential mechanisms](#). *American Journal of Clinical Nutrition*, Vol. 77, No. 3, 700-706, March 2003.

10. [Supplementation with mixed tocopherols increases serum and blood cell -tocopherol but does not alter biomarkers of platelet activation in subjects with type 2 diabetes](#). *American Journal of Clinical Nutrition*, Vol. 83, No. 1, 95-102, January 2006.

Polyphenols

Polyphenols comprise a wide range of natural compounds found in plant foods. They include phenolic acids and flavonoids, which are antioxidants found in fruits, vegetables, soy products, tea, and wine, and are predominantly water-soluble. Flavonoids are responsible for the blues, purples, and greens in foods, and for the yellows, oranges and reds that are not carotenoids.

Generally, the darker the color, the more flavonoids are present in foods, but are also present in onions, nuts, and some other light-colored foods.

Research links flavonoids to reduced risks for cancer, heart disease, and other age-related degenerative diseases, as well as antioxidant protection of body fluids such as blood.(11) They also may help prevent stroke, flu, tooth decay, and other ailments.

11. [Cocoa antioxidants and Cardiovascular Health](#). *American Journal of Clinical Nutrition*, Vol. 81, No. 1, 298S-303S, January 2005

Cocoa Extract

Recent studies have shown that cocoa has potent health benefits due to the high levels of antioxidants called flavonoids that help to protect blood vessels, and prevent cancer by combating oxidative stress. The levels of flavonoids contained in cocoa are even higher than the ones found in apples, onions, tea or wine, foods known for their high amount of phenolic compounds. Comparing the chemical anti-cancer activity in beverages known to contain antioxidants, researchers at Cornell University found that cocoa has nearly twice the antioxidants of red wine and up to three times those found in green tea.(12)

Results of a study conducted at Penn State University showed that blood antioxidant levels increased when following diets containing a small amount of cocoa powder and dark chocolate. Researchers concluded that cocoa powder and dark chocolate may favorably affect cardiovascular disease risk status by modestly reducing LDL oxidation susceptibility, increasing serum total antioxidant capacity and HDL-cholesterol concentrations, and not adversely affecting prostaglandins. (13)

A recent study conducted in Japan concluded that increases in HDL-cholesterol concentrations may contribute to the suppression of LDL (bad) oxidation and that flavonoids in cocoa powder may contribute to an elevation in HDL (good) cholesterol.(14)

Another recent 18-week study involving otherwise healthy individuals with untreated upper-range prehypertension or stage 1 hypertension showed that small amounts of dark chocolate added to the diet efficiently reduced blood pressure. The prevalence of hypertension decreased from 86% to 68%.(15)

12. [Ahhhh! Better than red wine or green tea, cocoa froths with cancer-preventing compounds](#). *Cornell food scientists say* *Cornell News*. Nov. 17, 2003

13. [Effects of cocoa powder and dark chocolate on LDL oxidative susceptibility and prostaglandin concentrations in humans](#). *Am J Clin Nutr*. 2001 Nov;74(5):596-602

14. [Continuous intake of polyphenolic compounds containing cocoa powder reduces LDL oxidative susceptibility and has beneficial effects on plasma HDL-cholesterol concentrations in humans](#). *Am J Clin Nutr*. 2007 Mar;85(3):709-17

15. [Effects of low habitual cocoa intake on blood pressure and bioactive nitric oxide: a randomized controlled trial](#). *JAMA*. 2007 Jul 4;298(1):49-60.

Green Tea Extract

Numerous recent studies continue to confirm that green tea polyphenols have powerful anticarcinogenic, cardioprotective, neuroprotective and antimicrobial actions.

A team of researchers at Karolinska Institute in Stockholm found that green tea can block angiogenesis, the development of new blood vessels that tumors need in order to grow and metastasize. The researchers gave mice the equivalent of two-to-three cups of green tea a day. When lung cancer was induced, the mice supplemented with green tea showed significantly less tumor growth. The scientists found that green tea suppressed the development of new blood vessels and prevented metastasis.(16)

16. [Green Tea Ingredient Fights Cancer](#) *Mercola.com* 2008, 01/02

Blueberry Powder

According to the Mayo Clinic, blueberries rank as one of the top ten healthy foods as a low-calorie source of fiber, antioxidants and phytonutrients. Regular intake of blueberries may improve short-term memory and reduce the cellular damage associated with aging.(17,18) The USDA Human Nutrition Research Center on Aging at Tufts University found that blueberry supplementation improved the chemical pathways involved in converting short-term to long-term memory.(19) They also found that blueberries rank #1 in antioxidant activity when compared to forty other fresh fruits and vegetables.

Other health benefits from blueberries include improved cognitive function, concentration and memory, eye and retina health, urinary tract health, and healthy glucose metabolism.(20)

The George Mateljan Foundation's article on blueberries is an excellent source for more information on the health benefits of blueberries.(21)

17. [Top 10 Healthy Foods -- and Why They're Good for You.](#) Mayo Clinic.
18. [Blueberries: New Thrills for Those Over the Hill.](#) NIH National Institute On Aging.
19. [The beneficial effects of fruit polyphenols on brain aging.](#) *Neurobiol Aging*. 2005 Dec;26 Suppl 1:128-32. Epub 2005 Sep 27
20. [Anti-diabetic properties of the Canadian lowbush blueberry *Vaccinium angustifolium* Ait.](#) *Phytomedicine*. 2006 Nov;13(9-10):612-23. Epub 2006 Sep 18.
21. [Blueberries.](#) The George Mateljan Foundation.

Rosemary Powder

Rosemary has been used for centuries as a brain stimulant, a remedy for heart trouble, an antiseptic, an insect repellent, and a food preservative. According to Dr. James Duke, former U.S. Department of Agriculture chief of medicinal plant research, and one of the world's leading authorities on medicinal plants, rosemary may retard the progression of Alzheimer's disease. (22) It contains more than a dozen antioxidants and a half-dozen compounds reported to prevent the breakdown of acetylcholine, a deficiency in the brain of those with Alzheimer's.

A University of Nebraska study showed that the phenolic compounds carnosic acid and carnosol in rosemary significantly lowered DNA damage.(23)

22. [Remembering rosemary - this culinary delight packs antioxidants - Healing Herbs.](#) Barbra Cohn. *Better Nutrition*. June, 1998. *Barbra Cohn is the owner of Boulder Freelance Writers, a firm specializing in writing for the natural products industry.*
23. [Potential of rosemary \(*Rosemarinus officinalis* L.\) diterpenes in preventing lipid hydroperoxide-mediated oxidative stress in Caco-2 cells.](#) *J Agric Food Chem*. 2007 Feb 21;55(4):1193-9. Epub 2007 Jan 31.

L-Glutamine, S-Adenosyl-L-Methionine (S-AdoMet), and Alpha-Lipoic Acid

L-Glutamine

L-glutamine is an amino acid that has been extensively researched, and among its many benefits, has been shown to significantly strengthen the immune system. It is part of many of the proteins produced in our bodies, including proteins in muscles, immune cells and the protective lining of the intestines. It helps the body maintain a healthy pH balance and is necessary for making and repairing cells. Adequate levels of glutamine may help to maintain the body's levels of immune cells, while a deficiency of this amino acid can significantly slow the healing process.

As mentioned in the introduction of this report, excessive exercise can contribute to an increase in free radicals in the body. Because most of the body's glutamine is stored in muscle tissue, athletes who over-stress their muscles are more prone to infections and slow recovery time

without adequate L-glutamine intake.(24)

24. [Metabolic role of glutamine and its importance in nutritional therapy](#) *Nutr Hosp.* 1996 Jul-Aug;11(4):215-25.

S-Adenosyl-L-Methionine (SAME)

SAME is a naturally occurring molecule that is found in all living cells, but is found only in minute amounts in the diet. It is necessary for normal brain function, and is protective against a variety of toxic agents that promote oxidative stress.(25,26)

25. [S-adenosyl-L-methionine](#). Vitamin and Herb University.

26. [Antioxidant properties of S-adenosyl-L-methionine in Fe\(2+\)-initiated oxidations](#). *Free Radic Biol Med.* 2004; 36(10):1303-16.

Alpha-Lipoic Acid

Alpha lipoic acid has been called the universal antioxidant because it boosts glutathione levels in cells and has both fat and water soluble properties with potent antioxidant actions. It has been suggested as a dietary supplement to treat diseases associated with excessive oxidant stress. A study of antioxidant effects of alpha-lipoic acid in cultured human endothelial cells showed that alpha-lipoic acid enhances both the antioxidant defenses and the function of endothelial cells.(27) Lipoic acid may also slow aging of the brain, and may be an anti-aging substance, in general.(28)

27. [The Role of Alpha-Lipoic Acid in Inflammation and Atherosclerosis](#). Weijian Zhang, M.D., Ph.D,

28. [Uptake, recycling, and antioxidant actions of alpha-lipoic acid in endothelial cells](#). *Free Radic Biol Med.* 2002 Jul 1;33(1):83-93.

Comments from your researcher

We would love to know what you thought of this **antioxidant research** report. Please [contact us](#) with any suggestions or comments.

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