



Without its antioxidant defense, your body would succumb to oxidation the way a sliced apple browns from air exposure.



Glutathione: *Your* *Body's* *Secret Weapon* against disease

by Stuart Hope

L-glutathione is the body's super weapon, the key antioxidant that the body makes and uses to fight off the harmful effects of caustic molecules. Left unchecked, these destructive molecules, called free radicals, would wreak physiological havoc, causing the same kind of "rust" that browns a sliced apple.

You can't live without oxygen, but you pay a price for immersion in an oxygenated world. Your body uses oxidation for many physiological processes. But at every moment, and even as you read this, your cells are fending off harmful molecules that are the byproducts of breathing and other normal functions. Researchers now believe that the damage caused by these so-called molecular "free radicals" foments much of the physical deterioration like creaking muscles and faltering immunity that are linked to aging.

As Theodore Hersh, MD, a former professor of medicine at Emory University, explains, antioxidants are crucial for keeping our bodies free of disease.

"Cell metabolism occurs when our cells burn energy," says Dr. Hersh. "As an end result, toxic substances called free radicals are produced; they damage cells, and also circulate throughout our bodies. These toxic free radicals are what causes our body to actually oxidize or rust; much like when a sliced apple turns brown, which is also a process of oxidation. Free radicals affect cell membranes and other metabolic processes and are the direct cause of premature aging, immune disorders, and over 50 chronic diseases including heart disease and cancer.

"The body has a built-in system of defensive molecules that fight against excess free radicals. These defense molecules are called antioxidants. These exist in every cell and body fluid. Antioxidants neutralize and scavenge free radicals. Antioxidants also protect us from the ravages of free radicals, decreasing the risks of premature aging and diseases.

Antioxidant Superstars

"The most important group of antioxidants in each cell and body fluid is known as the glutathione complex, which includes the small and ever-present molecule L-glutathione, which I call 'the commander in chief' of antioxidants. The glutathione complex also includes related enzymes and selenium which itself is an antioxidant and anti-carcinogen. The glutathione complex

works together, synergistically, with the dietary antioxidant vitamins C and E. Vitamins C and E are important, but did you know, after a molecule of vitamin C neutralizes a free radical, it actually becomes a free radical itself? This same process occurs with vitamin E. It is glutathione that regenerates the vitamin C after it has neutralized a free radical and together, vitamin C and glutathione regenerate vitamin E to keep the cells antioxidant defenses functioning at all times. This glutathione antioxidant system along with the vitamins C and E actually replicates your body's antioxidant defense system."

Synergy

When taken with other antioxidant nutrients, glutathione is believed to exert a powerful synergistic effect on health. In conjunction with selenium and other antioxidant nutrients, including vitamins C and E, glutathione may empower your immune system to resist disease more effectively.

In this way, glutathione is thought to help:

- Limit oxidative damage to cell membranes, structures and functions
- Inhibit the cholesterol in your blood from breaking down into harmful blockages
- Inhibit damage to DNA that might otherwise lead to cancer

L-glutathione is the body's principal cellular protection device and functions in multiple ways to prevent disease and detoxify chemicals. On a molecular level, glutathione donates molecules that regenerate vitamins C and E so that they can more effectively take part in cellular defense.

Glutathione's Big Health Dividends

As Ian Crandall, PhD, professor at the University of Toronto, points out, L-glutathione is stored in cells like energy in batteries. When the cells are threatened by harm from free radicals, the L-glutathione is called into action to quell the reactive molecules.

Your breathing also depends on L-glutathione, according to research at the

Emory University School of Medicine. These scientists found that when you overindulge in alcohol for long periods of time you cause a deficiency of L-glutathione in the lungs. That deficiency can make you prone to serious lung diseases (Experimental Biology, New Orleans 4/24/02).

Oxidative Stress

Oxidative stress results from too many free radicals or too few antioxidants. Oxidative stress leads to premature aging and many diseases. Thus, the consensus is growing among researchers that we should strive to keep our antioxidant stores well replenished through diets high in fruits, vegetables and grains, and supplemented with synergistic antioxidant compositions that contain glutathione.

Dr. Hersh points out, "Free radicals are created in excess through varied external sources, such as exposure to environmental pollutants, and tobacco smoke. Also, the skin generates myriads of free radicals when exposed to the radiation from sunrays or tanning booths and from radiotherapy. Other free radical stimuli include the ingestion of fatty foods like meats and dairy products and the consumption of alcohol, to name the most prevalent."

In addition, Dr. Hersh goes on to say, "Common diseases associated with oxidative stress include diabetes, obesity, high blood pressure and kidney failure. Chronic infections like hepatitis C and HIV/AIDS are included, as are several of the diseases of the elderly like Alzheimer's and Parkinson's diseases and macular degeneration, the leading cause of blindness in the elderly. Since antioxidant levels decrease as we age, antioxidant supplementation may help avert these geriatric diseases.

"Other common conditions associated with free radicals include atherosclerosis, which leads to coronary heart disease and strokes, chronic lung disease, and various forms of arthritis."

Lung Protection

According to David Guidot, MD, professor of medicine at Emory, although L-glutathione is manufactured in many organs and tissues, the lungs are particularly dependent on L-glutathione for protection from oxidative damage, especially in the small airways where breathing takes place. The lack of L-glutathione in the lungs leads to a variety of serious problems, says Dr. Guidot, including damage to the epithelial cells and fluid that lines the lungs. It can also result in death of lung cells and compromise the lungs' abilities to keep out toxic pollution.

Dr. Hersh also points out that current dietary practices in the United States are shortchanging us of our need for protective antioxidants. Without a ready supply of antioxidants from vegetarian foods, and the fuel our body needs to make sufficient L-glutathione, we increase our risks of serious diseases.

"Statistics show that less than 10% of the US population consumes the recommended five to nine daily servings of fruits and vegetables," Dr. Hersh warns. "Therefore, you need an effective antioxidant in nutritional supplements to maintain your antioxidant stores."

Chain Reactions

When you miss out on antioxidant protection, your body can succumb to a cascade of molecular destruction that can cause serious problems.

"Research shows that antioxidants combat oxidative stress by neutralizing excess free radicals and stopping them from starting the dangerous chain reaction that leads to all these terrible diseases," Dr. Hersh explains. "One of the only ways to keep our bodies healthy, and to ensure that the free radical levels inside our bodies are kept at a minimum, is to ensure a continuous build-up of antioxidants in our body at all times through diet and nutritional supplementation.

"Awareness of the benefits of antioxidants is becoming well known. There is now a wealth of literature supporting the many benefits of antioxidants. Antioxidants are not only life extenders, but also vital pre-

ventative agents.

"L-glutathione is particularly effective in this regard. It serves as a kind of 'hub' with other 'spokes' on the antioxidant 'wheel,' including vitamins A, C and E, along with selenium, catalase, super oxide dismutase and N-acetyl-L-cysteine. Without glutathione, cells die."

An antioxidant program should be designed to replicate the endogenous substances that are made in the body to fend off disease. Since these antioxidants are already present in the body's cells, the immune system does not reject them as foreign substances, but they are allowed time to assist in the job of health protection.

As Dr. Hersh says, "In other words, using antioxidants that your body recognizes, such as those found naturally in fruits, vegetables and juices, is a smart strategy. They work synergistically. If you rely solely on only one or two, you aren't getting the complete complement of antioxidants."

Prefab Protection

If you look at your diet and the body's antioxidant systems as an architectural construct designed to build an immune fortress against disease, a glutathione-based antioxidant system is like having all the pieces together for you. Conceptually, it's like buying your home already built, instead of facing the task of having to build it for yourself from scratch.

Essentially, the combination of glutathione, N-acetyl-L-cysteine and selenium is like a prefabricated

building that already has the construction pieces put together for your body's molecular needs. Under some circumstances, the body ingests nutrients that it then has to either break down or reassemble into the proper order and structure that solves its physiological tasks. With this complex the pieces are available pre-constructed.

Planning for Health

When it comes to boosting your chances of good health, it makes sense to get plenty of vitamins and antioxidants. Together, they provide excellent insurance against the aging process.

As Dr. Hersh explains, "Vitamins have different functions than antioxidants. Vitamins are essential to the

body's well-being and you should take a multivitamin plus an antioxidant supplement.

"I always recommend: Take a multivitamin, take a glutathione-based antioxidant, eat a balanced diet with more than five servings of fruits and vegetables and exercise regularly, trying to maintain one's ideal body weight."

Antioxidants are Like Money in the Bank

According to Dr. Hersh, your body saves up and uses antioxidants the same way you deposit money in a bank account and take it out.

"When I go shopping and decrease my bank account by spending money, similarly your body spends antioxidants in its constant battle against free radicals. We have to work to replace the money in the bank and you and your body have to work to replenish your store of antioxidants. Eating a diet rich in fruits and vegetables is an excellent practice. These nutrients are naturally high in antioxidants, and the synergy between the various molecules contained in fruits and vegetables is critical.

"Part of the reason fruits and vegetables are better for you than isolated nutrients may be due to the interaction between nutrients... many nutrition experts are coming to believe that beta carotene, vitamin C and other nutrients have faltered in clinical trials because they need their nutrient partners to work..."

Admittedly, in our imperfect world not all oxidative damage can be stopped. If it could, perhaps we'd live forever.

But, a solid dose of antioxidants seems to be your best antidote for the vagaries of aging. ■