

Glutathione

What is Glutathione

Glutathione is a small molecule made up of three amino acids, which exists in almost every cell of the body. However, Glutathione, must be generated within the cell from its precursors before it can work effectively in the body.

The presence of glutathione is required to maintain the normal function of the immune system. It is known to play a critical role in the multiplication of lymphocytes (the cells that mediate specific immunity) which occurs in the development of an effective immune response.

Furthermore, the cells of the immune system produce many oxiradicals as a result of their normal functioning, resulting in a need for higher concentrations of antioxidants than most cells. Glutathione plays a crucial role in fulfilling this requirement.

Glutathione as a Detoxicant

Supplemental detoxicants become necessary as our environment becomes increasingly polluted. Our food and water sources are contaminated with chemicals. One of our main defenses against pollutants is glutathione, which is present in the liver in high concentrations. Glutathione acts as a detoxifying agent by combining with undesirable substances and ridding the body of them through urine and bile. It is important to note that unless the Colon, Liver and Blood are also detoxified, the benefits of Glutathione as a detoxicant may be minimized.

To Get a Little More Technical About Glutathione

"Glutathione is a ubiquitous tripeptide molecule, consisting of three amino acids joined together. These are cysteine, glutamic acid and glycine - three of the twenty two amino acids which comprise the building blocks of all known proteins. In general, the amino-end of one amino acid combines with the acid-end of another to form a peptide bond with the elimination of water. Chains of amino acids are called proteins. The sequence of amino acids and the arrangement in space of each peptide bond defines some specific structural features of all proteins and olegopeptides (few amino acids in sequence) that relate to their function."

Glutathione (Psychoneurobiology)

"Free radicals and oxyradicals have been recognized by psychoneurobiologist as playing an important role in the development and progression of many of these disorders. The brain is particularly susceptible to free radical attack because it generates more oxidative-by-products per gram of tissue than any other organ. The brain's main antioxidant is glutathione- it's importance cannot be overstated."

"Oxidative stress and glutathione are important factors in such various disorders as brain injury, neurodegenerative disease, schizophrenia, Down syndrome and other pathologies."

Disorders of the brain and nervous system that are linked to oxidative stress

Brain Injury	Neurodegenerative disease	Others
Brain injury	Parkinson's disease	Schizophrenia
Trauma	Alzheimer's dementia	Down syndrome
Stroke	Multiple sclerosis (MS)	Tardive dyskinesia
Ischemia	Lou Gehrig's disease (ALS)	Sleep deprivation
Toxicity of lead, mercury, etc.	Lipofuscinosis (Batten's disease)	Huntington's chorea

"Many neurological and psychiatric disease processes are characterized by high levels of oxidative stress and free radical formation, as well as abnormalities in glutathione metabolism and antioxidant defenses."

Source Dr. Gutman M.D. *Glutathione GSH*

Dr. Perlmutter: "Eighty to ninety percent improve dramatically. It's felt that the mechanism that allows it to work is in increasing the sensitivity to certain receptors to dopamine. Glutathione doesn't raise dopamine levels, but it allows the dopamine in the brain to be more effective. That's not a new idea in medicine. Diabetic drugs work not by increasing insulin, but by increasing the receptors to insulin. Glutathione not only increases sensitivity to dopamine, but also to serotonin, which may explain why many of our depressed PD patients have a remarkable improvement."

Increasing glutathione in the body has been proven to be essential in the treatment of disease. Antidepressants and other medications deplete the body and brain of glutathione.

Functions of Glutathione

Enhancing the Immune System - Your bodies immune activity, involving unimpeded multiplication of lymphocytes and antibody production, requires maintenance of normal levels of glutathione inside the lymphocytes.

Antioxidant and Free Radical Scavenger - Glutathione plays a central protective role against the damaging effects of bacteria, viruses, pollutants and free radicals.

Regulator of Other Antioxidants - Without glutathione, other important antioxidants such as vitamins C and E cannot do their job adequately to protect your body against disease.

A Detoxifying Agent - Another major function of glutathione is in the detoxification of foreign chemical compounds such as carcinogens and harmful metabolites.

GLUTATHIONE: The Body's Master Antioxidant

Glutathione functions as an antioxidant and an antitoxin and is extremely important for the protection of major organs, the function of the immune system, and the fight against aging. It minimizes the damage caused by free radicals and is very important for the health of cells. Its major effect is inside the cells, especially within the mitochondria – the actual "power plants" of every cell in the body. Recent, extensive research has shown the direct relationship between decreased glutathione levels and the progression of many chronic diseases.

Glutathione is present in the diet in amounts usually less than 100 milligrams daily, and it does not appear that much of the oral intake is absorbed from the intestine into the blood (see Pharmacokinetics). Glutathione is not an essential nutrient since it can be synthesized from the amino acids L-cysteine, L-glutamate and glycine. It is synthesized in two ATP-dependent steps: first, gamma-glutamylcysteine is synthesized from L-glutamate and cysteine via the enzyme gamma-glutamylcysteine synthetase—the rate limiting step— and second, glycine is added to the C-terminal of gamma-glutamylcysteine via the enzyme glutathione synthetase. The liver is the principal site of glutathione synthesis. In healthy tissue, more than 90% of the total glutathione pool is in the reduced form and less than 10% exists in the disulfide form. The enzyme glutathione disulfide reductase is the principal enzyme that maintains glutathione in its reduced form. This latter enzyme uses as its cofactor NADPH (reduced nicotinamide adenine dinucleotide phosphate). NADPH is generated by the oxidative reaction in the pentose phosphate pathway.

Absorption of orally administered glutathione has been observed in some animals (mice, rats, guinea pigs). Oral glutathione has been demonstrated to reverse age-associated decline in immune responsiveness in mice. In one study, glutathione was found to enhance T-cell mediated responsiveness, including delayed-type hypersensitivity (DTH). The mechanism of this effect was ascribed to the antioxidant activity of glutathione.