QUICKSILVER SCIENTIFIC®

LIPOSOMAL GLUTATHIONE

Supplement Facts

Serving Size: 1 mL (2 Pumps) Servings Per Container: 50	Amount Per Serving	% Daily Value
Opitac™ Glutathione	100mg	**
Phosphatidylcholine (from purified sunflower seed lecithin)	75mg	**

**Daily Value not established

Other Ingredients: Water, glycerin, ethanol, vitamin E (as tocofersolan), natural citrus and mint oils

Glutathione is the body's master detoxifier and most potent endogenous antioxidant.[1] Glutathione offers comprehensive antioxidant protection, binding to a wide array of damaging molecules, including reactive oxygen species (ROS), lipid peroxides, xenobiotics, pesticides, mycotoxins, oxidized vitamin E, oxidized vitamin C, methylmercury, medications, heavy metals, and other harmful substances. Glutathione serves as an essential cofactor for critical and powerful antioxidant enzymes including superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPX), glutathione reductase (GR) and glutathione-s-transferase (GST).[2] Glutathione also helps regenerate the antioxidants vitamin C and vitamin E.[3] Glutathione offers potent protection inside the mitochondria, our cells' energy powerhouses; is critical to our immune system function, helps dampen inflammation; is a key player in autoimmunity; and may confer protection from cancer, heart disease and Alzheimer's disease.[4,5,6,7,8] Packaged in our advanced nano-liposomal delivery system, our glutathione is protected from breakdown by stomach acid and delivered rapidly to the cells where it is needed most.

BENEFITS & APPLICATIONS:

- Powerful antioxidant[1]
- Essential cofactor for antioxidant enzymes[2]
- Supports all three phases of detoxification[11]
- Anti-inflammatory[14]
- Improves immune function[24]
- Helps fight infections[7,13]
- Regenerates vitamins E and C[3]
- Mitochondrial support[5]
- Dampens autoimmunity[35,36,37,38,39,40,41,42]
- Protects against degenerative diseases[32,33]
- Neuroprotective[34]
- Cardioprotective[29,30,31]
- Binds to and eliminates methylmercury[25]
- Binds to and eliminates mold toxins[27, 28]

SUPPORTS ALL THREE PHASES OF DETOXIFICATION

Glutathione is present in every single cell of our bodies—at surprisingly high levels equal to that of glucose, potassium or cholesterol.[9] Concentrations are five to ten times higher in hepatocytes than other cells as the liver is constantly processing and removing toxins.[10]

Strengthening the glutathione system supports all three phases of detoxification, but in particular phases II and III[11]

- **Phase I—Oxidation**: The liver converts a lipid-soluble toxin into a less harmful compound, preparing it for phase II detoxification. This occurs through oxidation, reduction and hydrolysis of substances via cytochrome P450 enzymes.
- **Phase II—Conjugation**: Glutathione binds to the toxin, rendering it water-soluble. This occurs through sulfation, glucuronidation, and glutathione conjugation of toxins.
- **Phase III—Elimination:** Cellular transport and elimination of the conjugated toxin through bile or urine.

Optimal phase II and III detoxification requires the activation of the cellular master switch Nrf2.[12] Nrf2 regulates over 500 genes involved in detoxification.

POTENT ANTI-INFLAMMATORY ACTION AND AUTOIMMUNE SUPPORT

Glutathione is integral to the proper function of our immune system. In autoimmune diseases, activated neutrophils and chronic inflammation lead to continual production of ROS and oxidative stress.[6] Altered intracellular levels of reduced glutathione (GSH) have been seen in infections and autoimmune disease, along with immune activation and inflammation.[13] The two arms of the immune system, TH1 and TH2, are regulated by intracellular glutathione levels, and even a modest increase in intracellular glutathione (GSH) and glutathione disulfide (GSSG) levels potentiates the immune action of lymphocytes.[14,15] Reduced levels of GSH have been linked with lupus, rheumatoid arthritis, autoimmune thyroiditis, cataracts, and aging.[16,17,18,19,20,21,22,23] Supplementing glutathione improves markers of immune function.[24]

CONJUGATES AND ELIMINATES MYCOTOXINS, METHYLMERCURY AND OTHER NEUROTOXINS

Glutathione plays an essential role in defending us from mercury toxicity. Mercury is a potent biological toxin that is present in auto pollution, fish, dental amalgam, vaccines, and contaminated air and water. Glutathione targets and binds methylmercury and prevents it from penetrating the cell, thereby reducing inflammation and protecting against oxidative damage.[25] Glutathione is also critical in conjugating and eliminating other heavy metals, such as arsenic.[26]

Chronic exposure to mycotoxins from mold can decrease levels of the enzymes needed to form glutathione, leading to compromised glutathione production and tissue damage or systemic illness.[27] Supplementing with liposomal glutathione is integral in the management of mycotoxin-related conditions.[28]

PROTECTS THE HEART AND BRAIN

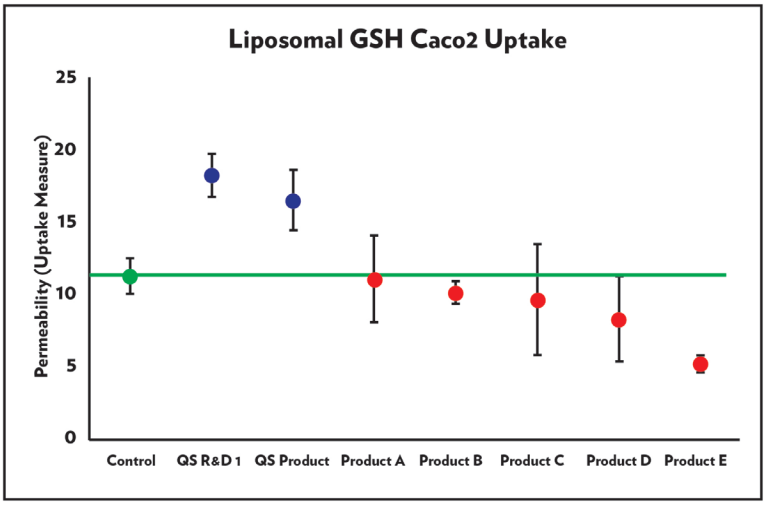
Glutathione is the most abundant antioxidant in the heart. Lowered levels play an important role in the development of cardiovascular diseases, and have been found in patients with coronary artery disease.[29] Depressed glutathione synthesis can lead to atherogenesis (fatty plaques) and is also associated with hypertension.[30] In contrast, an increased level of intracellular glutathione is correlated with lower blood pressure and a decreased incidence of diabetes.[31] In addition, glutathione is a key antioxidant for the mitochondria, which are more abundant in heart muscle than any other tissue in the body.[5]

Just as glutathione protects the heart, it can be neuroprotective and help support brain function. Neurodegenerative diseases are linked to increased mitochondrial oxidative stress, and lowered levels of mitochondrial glutathione.[32] The increased oxidative stress noted in Alzheimer's disease and mild cognitive impairment has been attributed to lowered levels of glutathione in the brain.[34,35]

NOT ALL GLUTATHIONE IS CREATED EQUAL

Typical oral delivery of glutathione is greatly inhibited by breakdown in the stomach. Our liposomal delivery system not only protects glutathione from breakdown in the digestive system, but also dramatically enhances cellular delivery. In cell cultures, liposomal glutathione has been demonstrated to be 100 times more efficacious for intracellular delivery than non-liposomal glutathione.[36]

However, not all liposomal glutathione is effective. Compared to other liposomal glutathione products on the market, Quicksilver Scientific Liposomal Glutathione has been found to have significantly higher uptake. Below is a Caco2 uptake study comparing the bioavailability of QS Liposomal Glutathione to one non-liposomal glutathione control and five competing liposomal glutathione brands. The "Permeability" number measures the rate of transport across the cell layer, indicating the uptake of glutathione in each formula. Both 'QS R&D1' and 'QS Product' Quicksilver Scientific formulations show significantly higher uptake versus competitor formulas. This uptake disparity is due to a number of factors, including particle size, stability, and glutathione degradation while on the shelf.



LIPOSOMES OFFER SUPERIOR BIOAVAILABILITY

In this increasingly toxic world, the assaults on our immune and detoxification systems are continual. A plentiful store of glutathione can offer potent antioxidant and immune support to help us handle the toxic burden. Because glutathione may be broken down by stomach acids, a liposomal formulation is key. Rapid action is a hallmark of our Quicksilver Delivery Systems®, which improve upon liposomal and emulsification technology with smaller, more stable particles made from the highest-grade ingredients available. These particles offer exceptional absorption rates, allowing rapid uptake of glutathione, the 'mother' of all antioxidants. The result is potent detoxification, immune support and antioxidant action to help your patients handle the modern world's toxic burdens.

Rev. 001

References available at quicksilverscientific.com/glutathionereferences/

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