AN EDUCATIONAL ARTICLE

Glutathione

The body's own master antioxidant, and what the research says about restoring it

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What if I said to you your body already produces the ideal solution for many health issues faced today. You may have never heard the word Glutathione before, but it is the most abundant antioxidant in our bodies. It is one of the most researched topics in PubMed and currently has over 200,000 results listed.

Before I go on to explain, I will preface my comments by saying I am not offering medical advice but do offer information and resources for you to look into further. I have provided links where possible. If you have never been aware of Glutathione before, this page is to bring awareness and provide possible supplementation options for you.

WHY GLUTATHIONE MATTERS

Glutathione is our “master” antioxidant, and it is in our cellular structure for good reason. It protects the human body like few others. The critical roles of Glutathione can be seen in Table 1 (link).

However, as we age our bodies don’t seem to generate the same amounts of it as it did in our youth. You need adequate levels of glutathione to help your body avoid dis-ease. It is known that low glutathione levels are in those suffering from medical conditions.

When you have healthy glutathione levels you can not only prevent health problems, but possibly experience more energy, better skin, a stronger heart and help lift that brain fog.

Glutathione in the body directly scavenges diverse oxidants and if levels are depleted it has been shown to be implicated in many chronic degenerative dis-eases, and contribute to the aging process. See dis-eases associated with GSH depletion in Table 2 (link).

WHAT IS GLUTATHIONE (GSH)?

Excerpt from referenced source [1].

Glutathione is a potent antioxidant found in both plants and animals. Often called the “master antioxidant,” glutathione also boosts (recycles) other antioxidants like Vitamin C, vitamin E, alpha lipoic acid, and CoQ10.

Glutathione is a tripeptide (the most abundant peptide). A tripeptide means a very small protein. Peptides are created from short chain amino acids:

The three amino acids that form Glutathione

- Cysteine
- Glycine
- Glutamic acid (or glutamate)

If you are low on specific amino acids the weak disulfide bonds break. The amino acids are used for the most critical pathways needed in the body.

Peptides in the human body

- Some help control biological functions
- Some act as hormones
- Most peptides found in the human body are 20 amino acids or less
- There are over 7,000 different peptides in the human body
- After age 21, peptides begin to decline in number and ability to function as they once did

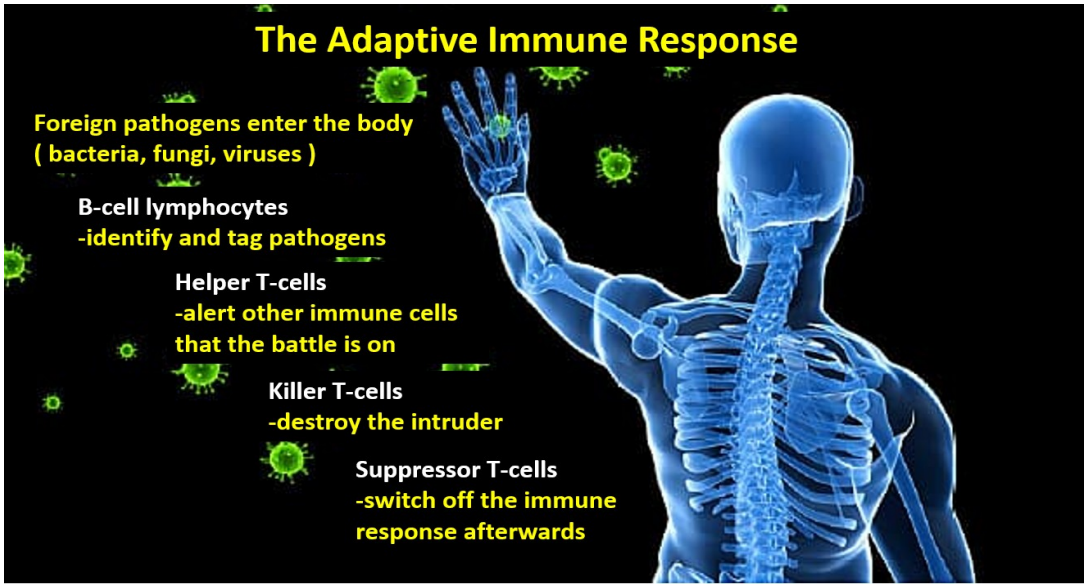
KEY ROLES OF GLUTATHIONE

- Detoxification
- Anti-inflammatory
- Recycling of Vitamin C and E
- Levels in the mitochondria are directly related to longevity
- Immune response

THE IMPORTANCE OF GLUTATHIONE IN YOUR BODY

T-cells are the primary defense against foreign pathogens including viruses, bacteria, tumour cells and others. Glutathione is important because:

- T-cells cannot reproduce without glutathione. The monoclonal expansion of our T-cells is fully dependent on the availability of glutathione.
- Low glutathione levels lead to low T-cell counts and then a weakened immune response.
- T-cells require glutathione to function correctly.
- Likewise, in an autoimmune situation the T-cells are critical. When there are plenty of B-cells but not enough T-cells, the immune system gets out of balance. Increasing the T-cell count can bring it back into balance.



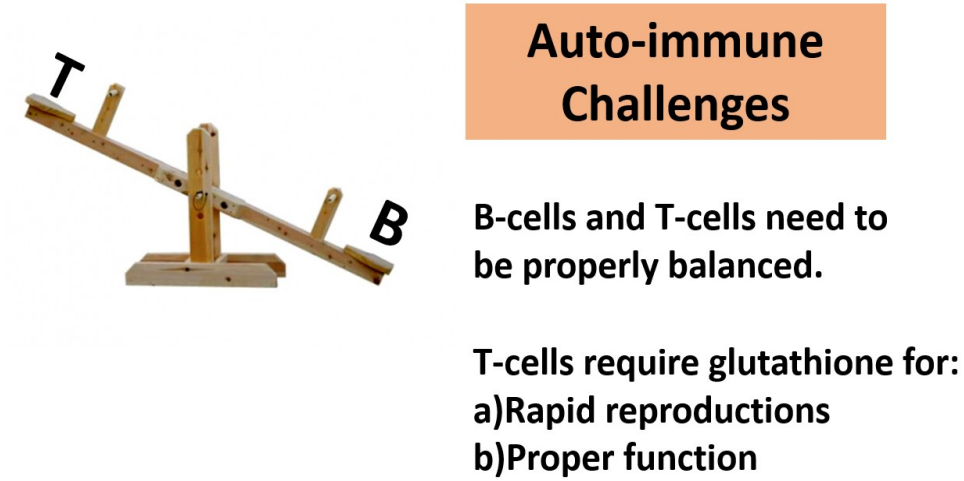
The adaptive immune response. B-cells identify and tag pathogens; helper T-cells alert other immune cells; killer T-cells destroy intruders; suppressor T-cells switch off the response when it is no longer needed.

T-CELLS

T-cells are a type of white blood cell called lymphocytes. They help your immune system fight germs and protect you from disease. There are two main types. Cytotoxic T-cells destroy infected cells. Helper T-cells send signals that direct other immune cells to fight infection.

Both T-cells and antibodies protect you from pathogens, but they play different roles in your immune system. B-cells are the other type of white blood cell (lymphocytes). It's B-cells (not T-cells) that make antibodies, a specific type of

protein that kills harmful invaders. While B-cells send antibodies to kill harmful cells, cytotoxic T-cells kill harmful cells directly.



Auto-immune challenges: B-cells and T-cells need to be properly balanced. T-cells require glutathione for rapid reproduction and proper function.

HOW DO I KNOW WHAT TYPE OF GLUTATHIONE SUPPLEMENTATION IS BEST FOR ME?

If you are thinking we get glutathione from our dietary sources, it is not sufficient as glutathione is poorly absorbed due to the gastrointestinal tract journey. Cooking and storage conditions can also decrease the amount of glutathione in food.

There have been a few ways you can supplement Glutathione, and many are not very effective, can be quite invasive, ineffective, and sometimes very expensive.

Intravenous Glutathione is costly and invasive, and does not last in the body for very long.

SUPPLEMENTING WITH N-ACETYL CYSTEINE (NAC)

In an effort to supplement the body in the hopes to generate Glutathione production, many people take an N-acetyl cysteine (NAC) supplement. However, in a manufacturer’s own listing for supplements offering NAC it is stated:

> *“N-acetyl cysteine is the precursor to the human body’s endogenous antioxidant glutathione … Despite the fact that N-acetyl-cysteine is not synthesized by the body … Additional research suggests that glutathione is not orally bioactive, and that very little of oral glutathione tablets or capsules is actually absorbed by the body.”*
>
> — Manufacturer documentation, Exposure Routes §13.1.3

A NANO-SIZED DELIVERY APPROACH

As you discover more about Glutathione and its importance, you will begin to wonder which type or brand is best to rely on.

We believe the most effective way in supplementing your body with Glutathione is to take it orally in a liquid nano-sized method so that it will seep into the membrane of your mouth prior to being delivered to the stomach and digestive tract.

A breakthrough nanotechnology has been developed so that Glutathione is able to reach your cells in 90 seconds using an ultrapure water delivery system that envelopes the glutathione in nano-sized particles to enable it to seep into your cellular structure. This is different than liposomal glutathione, which has glutathione particles wrapped in lipids (fats).

As with any supplementation, some realize results sooner than others as each body has been exposed to different environments and toxins.

WHERE TO BEGIN

If you would like to discuss what a sensible approach to glutathione support might look like for your own situation, please contact Cathy at Advanced Healing & Health. I would be happy to assist you in your nutrient and healing journey.

705-715-8716

advancedhealing.ca

Medical papers and scientific literature

Selected published sources on Glutathione, its delivery, and its role in human health.

NANOTECHNOLOGY DELIVERY SYSTEMS

1. Nanoarchitectonics for Smart Delivery and Drug Targeting. Elsevier / ScienceDirect. One of the first books to focus exclusively on nanoarchitectonics, a rapidly developing area of nanotechnology that allows scientists to arrange nanoscale structural units in an intended configuration. sciencedirect.com/book/9780323473477

CONTRAST WITH LIPOSOMAL DELIVERY

2. MDPI: A Review of Liposomes as a Drug Delivery System — Current Status of Approved Products, Regulatory Environments, and Future Perspectives. See Section 6, "Secondly… and Thirdly…" for important considerations. mdpi.com/1420-3049/27/4/1372

BENEFITS OF GLUTATHIONE

3. NIH / PMC: Regulation of epigenetic traits of the glutathione S-transferase P1 gene — from detoxification toward cancer prevention and diagnosis. ncbi.nlm.nih.gov/pmc/articles/PMC4100573

4. Frontiers in Pharmacology: Glutathione and mitochondria. frontiersin.org/articles/10.3389/fphar.2014.00151/full

5. PubMed: Glutathione in the Brain. pubmed.ncbi.nlm.nih.gov/34065042

From the same paper: "Glutathione (GSH) is the most abundant non-protein thiol, and plays crucial roles in the antioxidant defense system and the maintenance of redox homeostasis in neurons. GSH depletion in the brain is a common finding in patients with neurodegenerative diseases, such as Alzheimer's disease and Parkinson's disease, and can cause neurodegeneration prior to disease onset."

6. ScienceDirect: Glutathione (topic page, neuroscience). sciencedirect.com/topics/neuroscience/glutathione