

The Glutathione Building Protocol

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Introduction:

If taking traditional Glutathione pills were effective in increasing your body levels of Glutathione then we wouldn't have dug any deeper into this topic. However, the best way to build up one's Glutathione levels simply and effectively is through consuming the right basic foods or, less preferably, through taking the correct supplements of its basic building blocks in the form of pills.

The sad truth is that supplementing with Glutathione will simply not get absorbed into the body as effectively as eating the correct foods that will help your body produce it.

Liposheric-Glutathione is Glutathione designed with a spherical layer of Lipids in order to better protect the molecule from the digestive acids and enzymes because it was presumed at first to be a good vehicle for the delivery of Glutathione so it can survive digestion and reach the blood stream. Unfortunately, just like Glutathione pills, supplementing with Liposheric-Glutathione has also been proven ineffective since it doesn't fully survive the human digestion process and doesn't follow the correct distribution path through the body.

Liposomal-Glutathione (A kind of manufactured glutathione that is bonded with fat instead of being lipo-spherically engulfed in it) has also been proven ineffective in significantly increasing natural levels of Glutathione in the body.

On the other hand, supplementing with one of the main building blocks of Glutathione, NAC (*N-Acetyl-Cysteine*) and SAM-e (*S-Adenosyl-methionine*), has been proven to be very effective in elevating ones Glutathione levels when teamed up with the other Glutathione building blocks like Co-Enzyme Q-10, MSM, B-complex, Vanadium, Selenium, Magnesium and others (see the full list below detailing the various amino acids, vitamins, precursors, Co-factors, recyclers and catalysts needed).

In short NAC (500mg a day) or SAM-e (400mg a day) can't be turned into Glutathione by our body without the other necessary key components that are only found in certain foods or less preferably added through supplementation.

It is far more superior and more lasting biologically to build Glutathione through consumption of the right organic food rather than through supplementation with pills specially that supplementing with a pill carries some side effects (see below). Unfortunately, many low income inter-city dwellers & people living in poor countries like ours may find it very hard to secure high quality organic and diversified foods needed to increase glutathione production naturally. This being said, it is effective to supplement with high quality Co enzyme Q-10, vitamin C, MSM and PQQ if they were corn free and derived from an organic sources.

Normally one can't produce Glutathione in the event of a crucial blockage in something called the Methylation pathway. However, by almost eliminating your intake of sugar and carbs, eliminating the frying of your food especially with vegetable oils stopping the consumption of alcohol, stopping the usage of Fluoride based toothpastes, stopping smoking and reducing the consumption of coffee will also help you reopen your methylation slowly within 3 to 4 weeks!

L-Glutamine is essential in the production of Glutathione. It is a vastly abundant amino acid found in the human body and any balanced diet containing free range organic goat milk kefir, raw cruciferous vegetables such as spinach, kale and broccoli, parsley, and red cabbage will contain enough L-Glutamine in them. Even though that plant based L-Glutamine isn't as easily digested as the animal based ones, it is now close to impossible to locate whole toxins free, organic-free-range animal meats any longer.

In order to assist the body in producing Glutathione the Methylation pathway should not be able to run its course. This includes avoiding hindering factors such as consuming alcohol and smoking, dangerous and extreme alimentary lifestyle that cuts all higher quality animal sourced saturated fats and proteins. Practitioners of such lifestyles find it very hard to manufacture enough vitamin B₁₂ and Vitamin A both crucial to Glutathione production.

A-Building Glutathione through supplementation (Less Recommended):

- 1- **Selenium**, 55 up to 75 mcg/day. Selenium is needed for Glutathione Peroxidase, a glutathione recycling enzyme. **SelenoMethionine** and **SelenoCysteine** are Naturally occurring organic amino acids that contain selenium. Look for Supplements containing those protein-bound Selenium molecules. Plant-based supplements, particularly Mustard Seed-derived Selenium, contain the best form of this trace mineral.
- 2- **Choline**, 300mg or 1 pill each 2days of the L-Alpha Glycerylphosphorylcholine type or (**Alpha-GPC**). Choline as well as NAC and SAM-e are all badly needed to make Glutathione.
- 3- **Vitamin C**, 1g/day. At 1 gram a day no common side effects are observed. In this event, keep on reducing the daily dosage until the side effects are gone. Vitamin C and Glutathione recycle one another. Taking a Vitamin C supplement or even better eating a Vitamin C rich food which may increase blood Glutathione levels by 50 percent in healthy individuals! Many high-end supplements on the market now produce their high quality Vitamin C out of rose-hips. Avoid Vitamin C produced from corn. Luckily for us there are a few high-end Vitamin C makers in today's market that extract their Vitamin C from either Rose Hips, Pine Needles, Camu Camu, Wild Billy Goat Plum and Acerola Cherries. Taking a mixture of two types of Vitamin C is the best way to supplement for Vitamin C, the first one is **L-Ascorbic Acid** and the second is **Sodium Ascorbate**.
- 4- **Both Zinc and Copper**. Total Zinc intake should be 30-50 mg/day including food and multi-vitamins; Copper intake should be 2-5 mg/day. Western diet food unfortunately only provides 15 mg zinc and 1 mg copper. Choosing the best form of Zinc can be a challenge, as the less common organic Zinc known as **Zinc Orotate** is the best of all forms and the most absorbable by the body.
- 5- **Cysteine and glycine**. These are the component amino acids for glutathione. For optimal production we found out that eating some beef gelatin for glycine (ORGANIC BONE SOUP), and taking one 500 mg capsule of **NAC (N-acetylcysteine)** per day. **Goat milk Kefir** also contains a good amount of Bonded-Cysteine.
- 6- **SAM-e (S-Adenosyl-methionine)** 400mg/day is produced and consumed in the liver and is involved in over 40 trans- methylation reactions. After its reaction with Choline, the resulting reaction produces wonderful substances and compounds and later transformed into (SAH). In the presence of vitamin B₆, vitamin B₁₂ and folic acid, SAH will eventually be converted back into methionine, SAM, or cysteine as well as Glutathione.
- 7- **Vitamin E, B₁₂, B₉, B₆, B₂ and B₁** are all need each for a different reason to produce, combine, metabolize and recycle Glutathione. Each B vitamins has many forms. Avoid buying any cheap US or Chinese B-complex pills. Avoid taking too much Niacin (vitamin B₃) because it will rob you of the SAM-e as well as the B₆ both needed to make Glutathione. The only B₁₂ Recommended should be in the form of **HydroxyCobalamine**. More studies are coming out against MethylCobalamine since it may shed its Methyl annex and may bind to displaced Mercury that is being displaced by Zeolites, Glutathione, SOD, NAC, FAD, Cilantro or Chlorella forming MethylMercury.

- 8- **Magnesium**, 700mg/day is necessary for proper functioning of the enzyme G-G-T which is important in the synthesis of Glutathione. Its best form is **Magnesium Malate** and the other runner-up is Magnesium Glycinate.
- 9- **Vanadium**, 2mg once a week, Vanadium plays a key role in recycling Glutathione.
- 10- **Co Enzyme-Q10** 30mg/day also plays a key role in recycling Glutathione. **Ubiquinol CoQ10** is the best form of Co-Q10 available on the market. It can be absorbed up to eight times better than other forms of CoQ10.
- 11- **Melatonin**, 1 to 5 mg/day. (check with your doctor before supplementing with Melatonin) coupled with sleeping early, Melatonin can significantly increase glutathione production as well as the production of another lesser known naturally occurring anti-oxidant called Catalase.
- 12- **MSM**, 5 grams for kids to 20 grams a day for adults. Methyl-Sulfonyl-Methane of MSM, plays an important role in the production of glutathione in the body and doesn't carry any reported side effects in humans.
- 13- **Green Tea Extracts**, EGCG 600mg 1 capsule a day. It doesn't increase Glutathione production but has been proven to prevent its depletion in clinical trials as well as a super helper of Glutathione making it 15 to 20% more effective! It also has the positive effect of preventing and combatting almost every type of cancer.
- 14- **PQQ**, 'Pyrrolo-Quinoline-Quinone' 20mg 1 pill a day rejuvenates, recycles and even reanimates damaged mitochondria and by doing so it optimizes Glutathione production. The PQQ form marketed as **BioPQQ** seems to be the best rated and most bio-absorbable form of PQQ that we found on today's market.
- 15- **Turmeric with BCM-95** 750mg 1-3 capsules a day. It is equal in volume to the absorption of 7g of turmeric studies show. Other studies have also indicated that Curcumin/Turmeric enhances glutathione metabolism by a level varying between 5 to 10% if taken daily. New Comers on the market are even twice as effective as Turmeric with BCM-95 and those are **Theracurmin** and **Longvida**. Those Turmeric formulations do not even include piperine given how super bio-available they are.
- 16- **Silymarin**, 750mg 1 capsule a day enhances glutathione metabolism by a level varying between 25 to 30%. One of the most powerful formulation on the market is called **UltraTistle** that combines Silybin-Phytosome with Phosphatidyl-Choline
- 17- **Alpha-Lipoic-Acid**, 100mg / 2days enhances the buildup and maintains your body levels of Glutathione.
- 18- **L-Glutamine** 500mg 1 capsule a day (there's no need to supplement it since it's produced naturally by the human body in vast amounts). When dealing with a complete nutritional deficiency, take up to 1 grams of L-Gluamine daily.
- 19- Drinking either silica rich water, Kagan water or Natural sunlight activated Exclusion Zone water few cups a day has symbiotic regenerative donor/recipient anti-oxidants or UV radiation protection properties to many bio-molecule substrates including antioxidants such as glutathione and its recyclers.

B- Building Glutathione using only ORGANIC Food (Recommended):

- 1- **Organic Egg yolks** increase Glutathione production in many ways. Eating a dozen **Organic Eggs** per week is highly recommended. Eat them poached and make sure to mix them with the other ingredients we've mentioned below. The benefits of organic eggs are almost endless. Organic eggs can be considered as the ultimate food. Please Note that the Chicken laying the eggs should be free-ranging and not kept in a cage. Organic caged and grain fed chicken will lay unhealthy useless eggs not so different than regular industrial eggs.
- 2- **(Initial recommendation discontinued because of severe shortage of toxic free sourcing: ~~Organic goat and chicken organ meats from the heart and liver~~) New Recommendation: Asparagus, Avocados, Broccoli, Lacto-fermented Beetroot, Kale and Carrot juices** are rich in Alpha-Lipoic Acid that recycles Glutathione in your body! Once you use glutathione the body can recycle it thanks to (ALA). This anti-oxidant acid can also recycle other building blocks of Glutathione like vitamin C and Co-Q10 a catalyst for Glutathione production and general cellular activity. Should be served 3 to 5 times a week 80 to 200 grams per serving.
- 3- Other sources of food loaded with (ALA) are 'raw' **Spinach, Dandelion, Kale, Tomatoes, Brussels' Sprouts, and Walnuts**. Those foods are also rich in Magnesium, Sulfur, Folate (B9), B6 and B12 they plays a major role in Cysteine production in the body. Eat them on the daily 150-200 grams or more a day.
- 4- **Red and Green Hot Chili Peppers, Guava, Green Bell Peppers** (also contains PQQ see below), **Thyme, Parsley, Paprika and Tomatoes** all dramatically increase your production of Glutathione since they contain very high levels of vitamin C as this vitamin can single handedly increase Glutathione production by 50%. Eat them daily, 150 grams or more a day.
- 5- Methionin and Magnesium essential in Glutathione synthesis can be found in large amounts in **Organic Egg Whites, Free Range Chicken Meat, Walnuts and Pumpkin seeds** to name a few. Every day eat two poached organic eggs on a bed of organic fresh leafy greens (such as **Kale and Broccoli**) mixed with a medley of prairie picked greens (such as **Rosemary and Thyme**), a pickled dill mixed with some of the other ingredients mentioned in the ballpoint above and below. Make sure to include slices of Green Bell Peppers in your bed of green as well.
- 6- **Olive Oil, Walnut, Wine & Tomatoes** + Sleeping build Melatonin that is needed in Glutathione production.
- 7- **Mushrooms, Dills, Parsley and Black Peppers** contain enough levels of Vanadium in them which plays a role in recycling Glutathione. **Eat a dish of [Tabbouleh](#) (Bulgur free-Substitute with Organic Red Quinoa or crushed dried almond crumbs) every 2-3 days;** add one **Reishi or shitake mushroom & organic black pepper** with your organic **Bone Broth** also **once every 3 days**.
- 8- **Organic Goat Bone simmered for over 20 hours (heated with water and Organic Cider Apple Vinegar)** is a phenomenal source of rare natural minerals and Glucosamine as well as a great source of Co-Q10, Alpha-Lipoic Acid (ALA), Glycosaminoglycans (GAGs), Chondroitin Sulfate (CS), Keratin Sulfate (KS), Hyaluronic Acid (HLA), L-Glutamine, Glycine, Proline, Choline, Collagen and Gelatin. Once refrigerated, the broth will turn into a gelatin and the fat will separate from the broth. Scoop off the fat from the surface with a spoon and throw it away since it's been oxidized is isn't a good fat to consume. The remaining gelatinous broth is what you should consume. **Drink one soup scoop of it 3 times a week** for the rest of your life will help heal almost any metabolic condition you may have.

- 9- **Organic MSM.** It's a natural plant based form of Sulfur that is essential for many body functions. Without sulfur, glutathione cannot work. So, while not an antioxidant by itself, part of MSM's action is to improve your body's ability to make its own antioxidants. Glutathione has two different states within your body. There's reduced glutathione and oxidized glutathione. The ratio of those two signifies the overall oxidative status or the ability of your blood plasma to address oxidative stress. Organic MSM improves that overall ratio. In other words, the body would have much more glutathione that is bio-available. You can safely supplement with organic MSM with no side effect up to **1.5 grams per each kilogram of body weight** daily which comes up to 20 grams for kids and to 60 grams a day for adults as an upper limit. TO BE SAFE, take no more than 3 grams a day. This is the only supplement that we still recommend even in the all organic food only diet.
- 10- **Melatonin** has been shown to effectively raise Glutathione levels in many tissues including those of the brain, liver, muscle and blood stream. Build your **Melatonin** by deep sleeping for a minimum of 7 hours a day. Meditation and prayer also help build Melatonin studies have shown. Your pineal gland produces Melatonin, so avoid using mouthwash and toothpastes that contain Sodium Fluoride.
- 11- **'Milk Thistle'** is a plant used by herbalists for many centuries to treat various liver disorders. 'Milk Thistle' not only stimulates the growth and regeneration of injured liver cells but also prevents the degradation of Glutathione as known as Glutathione lipid peroxidation (GPx), Glutathione Reductase (GR) & Glutathione-S-Transferase (GST) and maintains its levels. The active component of milk thistle called **Silymarin**. Include at least 15 to 30 grams of the 'Milk thistle' leaves in you morning green medley with organic eggs breakfast.
- 12- **Juice** 2 to 3 ounces of **green leafy kale** to produce one ounce (2 table spoons) to a 'shot glass' (3 table spoons) of kale juice and drink once every 2 days. Sip it slowly. Never gulp your juices down quickly. Sipping ensures ample amounts of saliva will be mixed with your juices. Saliva contains vast amounts of Amylase which is a digestive enzyme needed to digest juices. The more Amylase goes down with the juice the less Amylase the Pancreas will have to fabricate to digest the raw juice.
- 13- **Juice** 3 to 4 ounces of **green parsley** to produce one ounce (2 table spoons) to a 'shot glass' (3 table spoons) of parsley juice and drink once every 3 days (no need to do that if you are already eating a dish of **Bulgur-Free Tabbouleh** once every 2-3 days). Parsley also contains a natural substance called 'pyrroloquinoline quinone' or PQQ in short that will help heal any damaged cellular Mitochondria (the fuel burning motor of every cell) and since Glutathione is built inside the mitochondria drinking parsley juice or eating tabbouleh will increase the levels of bioactive PQQ and optimize mitochondrial health. (Bergoul or Bulgur Substitute are Organic Red Quinoa or crushed dried almond crumbs)
- 14- **Turmeric** 5g or more a day in regular powder form. Other studies have also indicated that Curcumin/Turmeric enhances glutathione metabolism by a level varying between 5 to 10% if taken daily. Must be mixed with Organic crushed black pepper and olive oil in order to double its absorbtion.
- 15- **Sun exposure:** normal sun exposure specially sun gazing a few moments before sunset and at sun rise coupled with blue light blocking or using blue light filter glasses after sunset as part of your lifestyle, removing all LED lights in your home and place of work will help retain the Melamine and other neuroprotective brain chemicals reducing the over usage of glutathione for cellular repair all through the body.
- 16- **Cold exposure and the 'Wim-Hof' breathing technique:** will increase your Glutathione production dramatically

- 17- **Sleeping no later than 10pm:** will increase the recycling and production of glutathione by optimizing methylation and releasing the stress on the brain, liver, kidneys spleen and lungs.
- 18- Drinking either silica rich water, Kagan water or Natural sunlight activated Exclusion Zone water few cups a day has symbiotic regenerative donor/recipient anti-oxidants or UV radiation protection properties to many bio-molecule substrates including antioxidants such as glutathione and its recyclers.

WARNINGS:

- 1- If a person is already fighting certain cancer types allopathically and is taking chemo-therapy, those same Glutathione building blocks may get hijacked by cancer cells in order to conduct their own cancer cellular repairs and heal cellular damage incurred by the chemical toxins found in chemo-therapy.
Some research suggests that one should avoid elevating their levels of glutathione if on chemo-therapy for bone marrow, breast, colon, larynx and lung cancers, while some other newer research suggests otherwise completely.
- 2- N-Acetyl Cysteine can cause allergic reactions in a very small percentage of people, characterized by skin flushing, a drop in blood pressure, irregular heartbeat, and respiratory distress. Do not take intravenously without medical direction. Accidental overdose of intravenous N-Acetyl-Cysteine has proven to be fatal in rare cases. In extremely rare cases people who do not metabolize the amino acid correctly, may as a result be at risk for certain neurodegenerative diseases, including Multiple Sclerosis, Lou Gehrig's disease and Alzheimer's disease. Some people taking NAC also report skin rash, eczema, wheezing, nausea, vomiting, cramps and diarrhea.
- 3- Supplementing the wrong dosage of Melatonin can lead to daytime sleepiness, a dangerous side effect that may lead to accidents while operating a motor vehicle. Supplement only after consulting a MD. Naturopath before taking Melatonin. Children, pregnant or nursing women should not take melatonin before consulting a Naturopathic physician.
- 4- Toxic reactions can develop with overdose 'Milk thistle'. Cramps, gas and diarrhea. 'Milk thistle' should not be used before consulting a Naturopathic physician.
- 5- There are no known toxic side effects of MSM. One cannot overdose with MSM. The body will use what it needs and after 12 hours, will flush any excess amounts out of the body, MSM will flush what the body does not retain.
- 6- Avoid brand name vitamins made in the USA and China at all cost. Stick with European organic certified vitamins. They are known to have a zero tolerance for cheap production, chemical, biological & GMO contamination. For example they will not replace the real Folate (B₉) by synthetic cheap Folic Acid. Another example is to take the more expensive organic certified European made (B₁₂) known as Methyl-Cobalamin or Hydroxy-Cobalamin instead of the ten folds cheaper and toxic Cyano-Cobalamin that happens to also be called (B₁₂). Many companies now produce high quality Vitamin C out of rose-hips or Acerola cherry. Avoid any Vitamin C pills produced from corn.
- 7- Avoid the Flu vaccine and the vaccine called Gardasil. It is our opinion to avoid taking all vaccines with no exception because they artificially and genetically modify your immune system while exposing you to untold

cancer causing mutations from onco-viruses and other contaminants that they pick up from bovine, chicken and primate sources during the vaccine production stages.

- 8- SAM-e supplements should never be taken with any antidepressant drugs under any circumstances and is advised not to be taken if taking cough syrup such as 'Robitussin DM' or any other medication that may alter your levels of serotonin produced in the brain such as 'Ultram', 'Talwin' or 'Demerol'... Wait 2 weeks after surgery to take SAM-e because it starts rebuilding your nerve ends which may interfere with a fresh surgical procedure. Other mild, dose dependent, but less common side effects may include diarrhea, constipation, dry mouth, headache, mild insomnia, anorexia, sweating, dizziness, and nervousness.
- 9- It is known that a poorly administered non-organic, Coffee or even Chamomile enemas can and will result in a digestive complication as well as populating your intestines with undesirable bad bacteria. There are less than five doctors in all of Lebanon who know how to successfully administer enemas. Doctors or nurses administering Coffee/Chamomile enemas should be well versed in GAPS, Gerson's and Weston A. Price's instructions and methods.
- 10- Avoid Milk Thistle if you're on a hormonal therapy or dealing with hormonal diseases or have certain types of Cancers such as Ovarian Cancer.
- 11- Chew your juices. It may sound silly at first but slowly chewing your vegetables or fruits juices will allow enough saliva to commence the pre-digestion process that naturally occurs when eating those fruits and vegetables.

Conclusion:

It is essential to boost your Glutathione level if you wish to stay cancer free given all the oxidative damage our body is bombarded with day after day from exposure to: Ionized Radiation, Low Frequency Radiation, Industrial Free Radicals, Nano-Particles, Environmental & Agricultural Poisons, toxic Genetically Modified Organisms (GMOs) found in standard packaged and canned foods, heavy metals like Mercury which is even found in some children vaccines under the name Thimerosal, Industrial Halogens Contaminants such as Fluoride and Bromine now being added to water, breads and salts, Toxic Food Flavoring additives such as MSG (Monosodium Glutamate), food preservatives such as Sodium Benzoate and Poly-Sorbate-80, food colorants such as Allure Red AC (RED 40, E129), sodium lauryl sulfate (SLS) and Ammonium Lauryl Sulfate (ALS) found in almost all cosmetic product that are not organic, dangerous Bovine and swine hormones such as Monsanto's rBST, rGBH and artificial sweeteners such as Aspartame and Sucralose and finally the never ending cocktail of advanced antibiotics that only help breed more powerful and resilient super bugs...

In a less known study^[1] the levels of mercury poisoning through the form Thimerosal has led to levels of Glutathione to be depleted. This suggests that increasing the levels of glutathione will reverse the poisoning and will start chelating Thimerosal and Mercury from the body. This means that oxidative stress from H₂O₂, singlet oxygen, hydroxyl radicals, and lipid peroxides generated by mercury as well as other environmental toxins and heavy metals can be negated, chelated and the damage can even be REVERSED by increasing your body levels of Glutathione. Many children behavioral disorders and neural diseases from autism to OCD can be attributed in one way or another to an environmental risk factor like pesticide/herbicide poisoning, heavy metal poisoning, biological contamination and others.

Once again, building up Glutathione levels through the consumption of the correct foods is far more beneficial, retained, more bio-actively and less toxic on the body than supplementing for it since purity, safety and authenticity of mineral

salt/chelate supplements are always questionable (see table below). This being said, it is effective to supplement with high quality Co enzyme Q-10, vitamin C, MSM and PQQ if they were corn free and derived from an organic sources.

Notes:

1- Quantitative and Qualitative Difference between Food Minerals and Mineral in supplements called Mineral Salt/Chelate used in the production of Glutathione:

Natural Food Mineral	Compared to Minerals in Supplements
Magnesium	Up to 2 x better absorbed and retained.
Selenium	17 x the antioxidant effect, 123 x more effective in preventing nonenzymatic glycation, 2 x more retained
Vanadium	Safer and 50% more effective.
Zinc	Up to 6.46 times better absorbed, better form.

2- The growing list of diseases that can be reversed and even cured through the buildup of Glutathione in the human body:

- General health support and the natural extension of life, post-surgical recovery.
- Combating infectious diseases and optimizes immunity.
- Helps rebuilding gut flora and helps in healing Leaky Gut Syndrome.
- Helps in heling Celiac and Crones Disease.
- Helps in healing Rheumatoid Arthritis (RA), Osteo-Arthritis (OA) & Osteoporosis.
- All Liver Ailments, Detoxing Acetaminophen and healing the damage associated with alcohol usage.
- Helps in healing of Chronic Kidney Disease.
- Alleviate complications resulting from taking many prescription drugs (polypharmaceutical entrapment).
- Helps in healing Arterials Sclerosis, clogging and High Blood Pressure.
- Reduces elevated levels of Low Density Lipoproteins or what is falsely called high Cholesterol levels.
- HIV Infection.
- Bronchitis, Pneumonia, Pulmonary disease (COPD, asthma, and acute respiratory distress syndrome)
- Diabetes Type II (to improve glucose tolerance and antioxidant function).
- Reverse Buildup of Mercury, Cadmium, Arsenic and other heavy metals by natural chelation.
- Cataracts.
- Polycystic Ovarian Disease, Cystic fibrosis
- Adjunctive Nutritional Cancer Management.
- Aging process itself
- Neurodegenerative disorders (Multiple Sclerosis, Alzheimer’s, Parkinson’s, and Huntington’s diseases, amyotrophic lateral sclerosis, Friedreich’s ataxia)

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