

Neuroinflammation

Part 3

Supplements

- Trial and error
- Doses will be titrated and changed
 - May be really high initially - we are trying to put out a forest fire
 - Start with a dose - taper up until cooled off - then back down

Polyphenols

- Chemicals in plants
- Natural compounds that cross the BBB (unless severe inflammation)
- Most effective in NI
- Other antioxidants or natural compounds that can't cross the BBB will have limited effect
- There is individual uniqueness in which ones also
- Different microbiomes have different reactions
 - Need microbiome diversity!! Or we will decrease the benefit of these
 - Diversity of plant fibers helps diversity in the gut
 - Resveratrol/curcumin can increase diversity
- All on the following list - cross BBB, impact microglia

Polyphenols

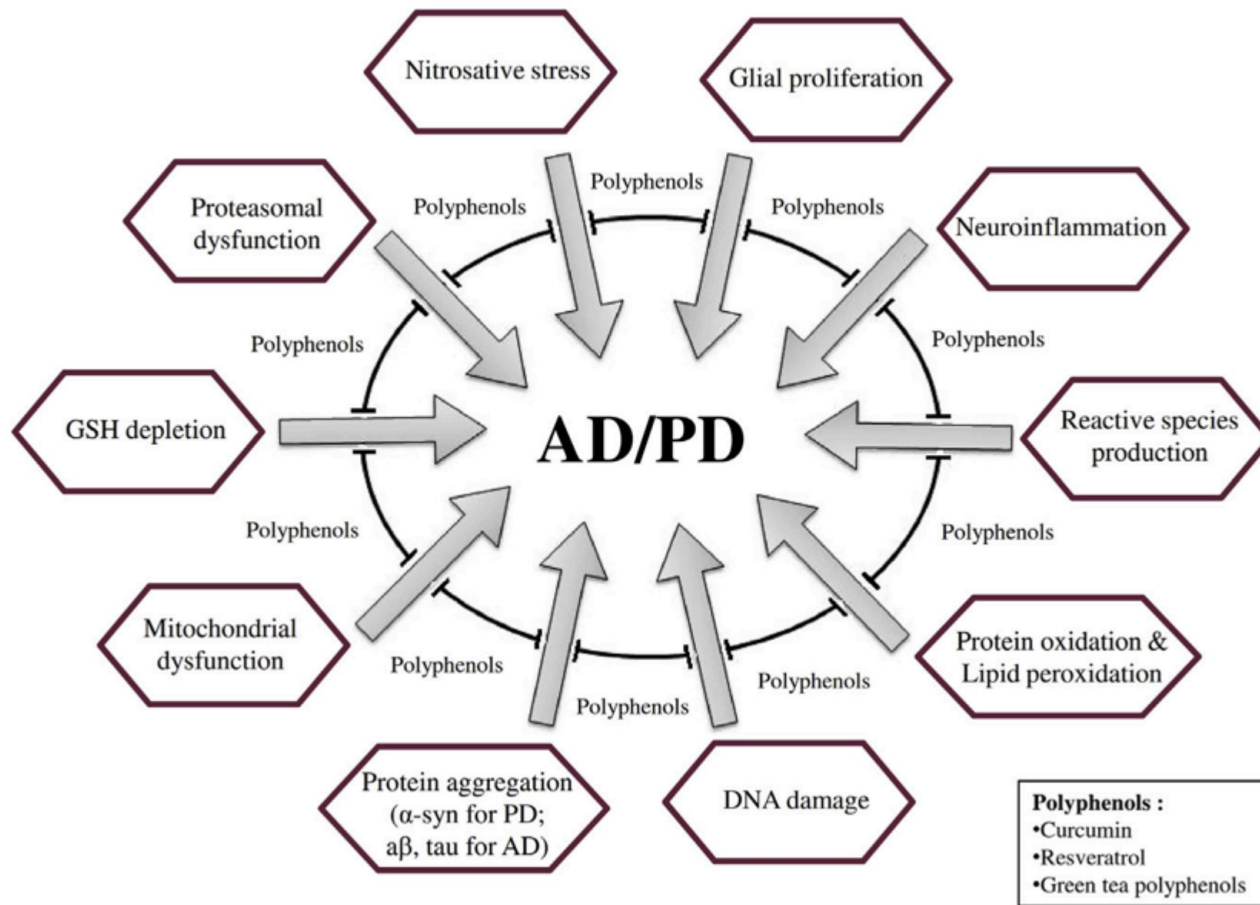
- Will dose these high to heal the brain
 - Heals BBB, heals NI, heals the gut
- Priority for BBB healing
- Consider daily for prevention
- They are synergistic - so many can be combined for better outcome
- Start with a few daily - go up as able
- Use several at high doses for acute inflammation/flares
- Use liposomal/micronized for best absorption

RATINGS OF POLYPHENOLS IN CLINICAL PRACTICE FOR NEUROINFLAMMATION

| | | | | | |
|-------------------------------|---|---|---|---|---|
| Resveratrol (Grape Skin) | ★ | ★ | ★ | ★ | ★ |
| Curcumin (Turmeric Root) | | | | | |
| Apigenin (Celery, Parsley) | | | | | |
| Catechins (Green Tea) | | | | | |
| Luteolin (Onions, Capers) | ★ | ★ | ★ | ★ | |
| Baicalein (Tree Bark) | | | | | |
| Rutin (Pomegranate) | | | | | |
| Naringenin (Orange, Cherries) | ★ | ★ | ★ | | |
| Quercetin (Berries) | | | | | |
| Hesperidin (Citrus Fruit) | ★ | ★ | | | |
| Fisetin (Strawberries) | | | | | |
| Myricetin (Grapes, Onions) | | | | | |
| Chrysin (Citrus Fruits) | ★ | | | | |
| Kaempferol (Broccoli) | | | | | |

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Key Concepts

- Polyphenols do not have the same impact on everyone.
- Polyphenols only become active when they are converted to metabolites by enzymes in the microbiome.
- Different microbiomes have different responses to polyphenols.



Key Concepts

- Polyphenols only become active when they are converted to metabolites by enzymes in the microbiome.
- They are not able to cross the blood-brain barrier until they are metabolized by the microbiome metabolites.



NeuroFlam™

Brain & Immune System Support*



Supplement Facts

Serving size 1 vegetarian capsule

Servings per container 90

| | Amount Per Serving | %DV |
|---|--------------------|-----|
| Catechins (from Green Tea Extract [<i>Camellia sinensis</i>] (leaf)) | 100 mg | * |
| Curcuminoids (from Turmeric Extract [<i>Curcuma longa</i>] (root)) | 100 mg | * |
| Rutin (from <i>Sophora japonica</i>) (bud) | 75 mg | * |
| Baicalin (from Baikal Skullcap Extract [<i>Scutellaria baicalensis</i>] (root)) | 60 mg | * |
| Resveratrol (from Japanese Knotweed Extract [<i>Polygonum cuspidatum</i>] (root)) | 50 mg | * |
| Apigenin (from Chamomile Extract [<i>Matricaria recutita</i>] (flower)) | 30 mg | * |
| Luteolin (from Chrysanthemum Extract [<i>Dendranthema morifolium</i>] (leaf)) | 20 mg | * |

*Daily Value (DV) not established.



Turmero-XL™ Active is an emulsified micronized formulation that delivers a concentrated source of curcuminoids (standardized to 95%) combined with black pepper extract in a pleasant-tasting liquid. Micronization reduces particle size to promote absorption, and black pepper extract is known to significantly enhance curcumin bioavailability.* This unique formulation elevates curcumin supplementation for optimal patient outcomes and dependable results.* Turmeric, a source of curcumin, has been used for around 4,000 years to support health and wellness, and modern science confirms that curcumin has a wide array of health benefits.*

Also available in a 8 fl oz bottle (K75) or in a softgel Turmero-SE™ Active (K121).



Enhanced
Absorption



Micronized
& Emulsified



Unique Syringe
Delivery



Liquid
Formula



Tested
for Gluten



Tested
for Dairy



Features

- 420 mg proprietary blend of high-quality turmeric extract, standardized to 95% curcuminoids per serving, and black pepper extract
- Turmeric derived from the plant root
- Enhanced curcumin bioavailability with micronized emulsification delivery and black pepper extract



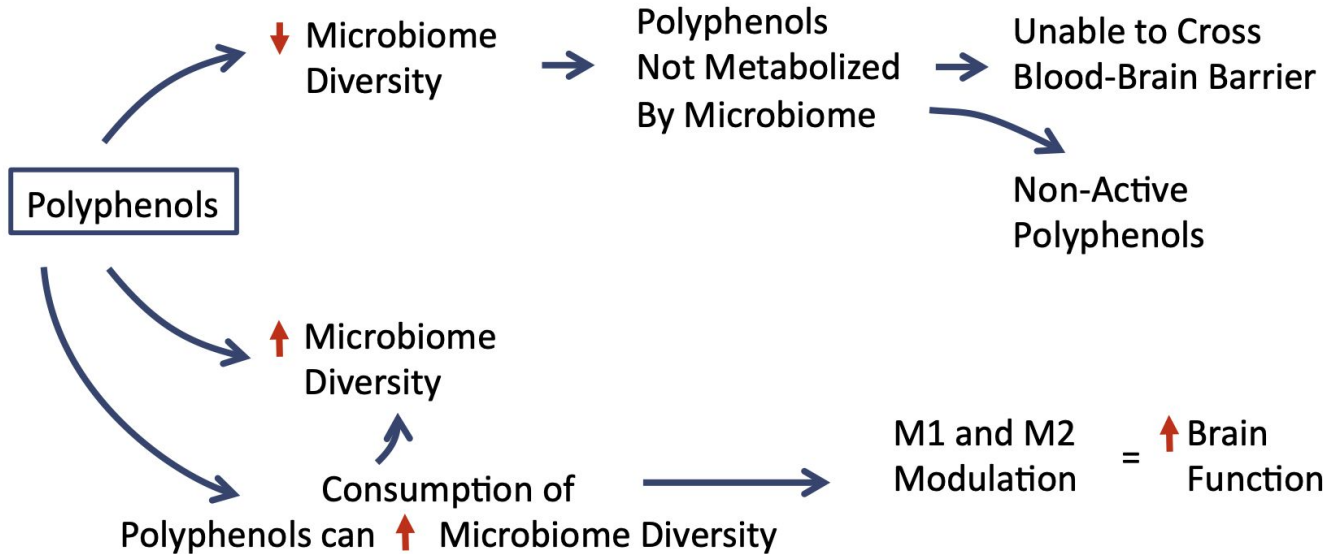
Resvero™ Active is an emulsified micronized formula wherein the particle size of concentrated trans-resveratrol (from *Polygonum cuspidatum*) is greatly reduced to enhance absorption and bioavailability. Furthermore, micronized structures, known as micelles, easily float among the intestinal environment to optimize physiological activity. A breadth of studies has demonstrated the potential health benefits of resveratrol.* Also available in an 8 fl oz bottle (K76) or in a softgel Resvero-SE™ Active (K125).

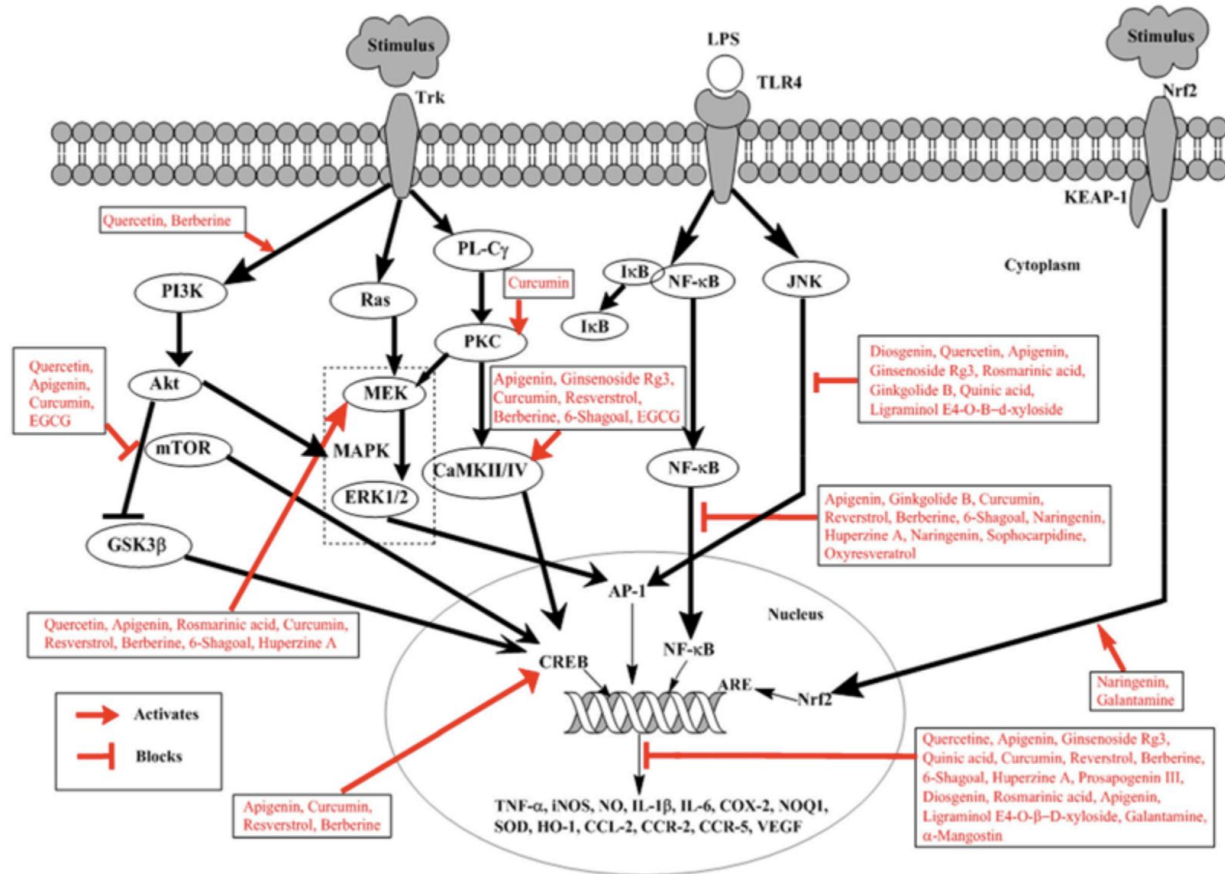
Features

- 250 mg high-quality trans-resveratrol extract per serving
- Enhanced trans-resveratrol bioavailability with micronized emulsification delivery*
- Liquid form is ideal for those who have difficulty swallowing capsules
- Pleasant, natural creamy coconut-pineapple flavor
- Can be consumed straight, mixed with other Apex Energetics liquid formulas, or added to a cool beverage, such as a smoothie
- No artificial sweeteners, colors, or flavors
- Gluten and dairy free, as confirmed by finished-product testing



POLYPHENOLS AND GUT MICROBIOME





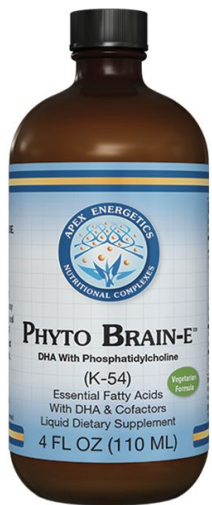
DHA

- Used DHA more than EPA
 - EPA is more for systemic and vascular inflammation
- Helps NI
- Needs to be absorbed to get to the brain
 - Need healthy gallbladder function to absorb EFA's
- When we lose brain gut access - lose the brain/GB too
 - GB controlled by the vagus
 - S/S - slow motility, hard to swallow pills, lack GB
 - Do vagus exercises
 - Take enzymes if needed with the supplements and fats
- Brain DHA levels low - cell membranes break off → lose neurons

Key Concepts

- DHA is the most abundant fatty acid in the brain and regulates several key functions at the phospholipid membrane of neurons.
- With significant inflammation, cell membrane DHA breaks down to modulate neuroinflammation.
- DHA can cross the blood-brain barrier after oral ingestion and may be required during times of neuroinflammation.





Phyto Brain-E™ includes 1200 mg of DHA uniquely derived from phytoplankton. Omega-3 fatty acids are vital to the health and function of the brain and play critical roles in the structure, fluidity, and permeability of cell membranes.* They are also necessary for healthy intercellular communication (signaling).* A large size of Phyto Brain-E™ (K123), which contains 8 oz, is also available.

Features

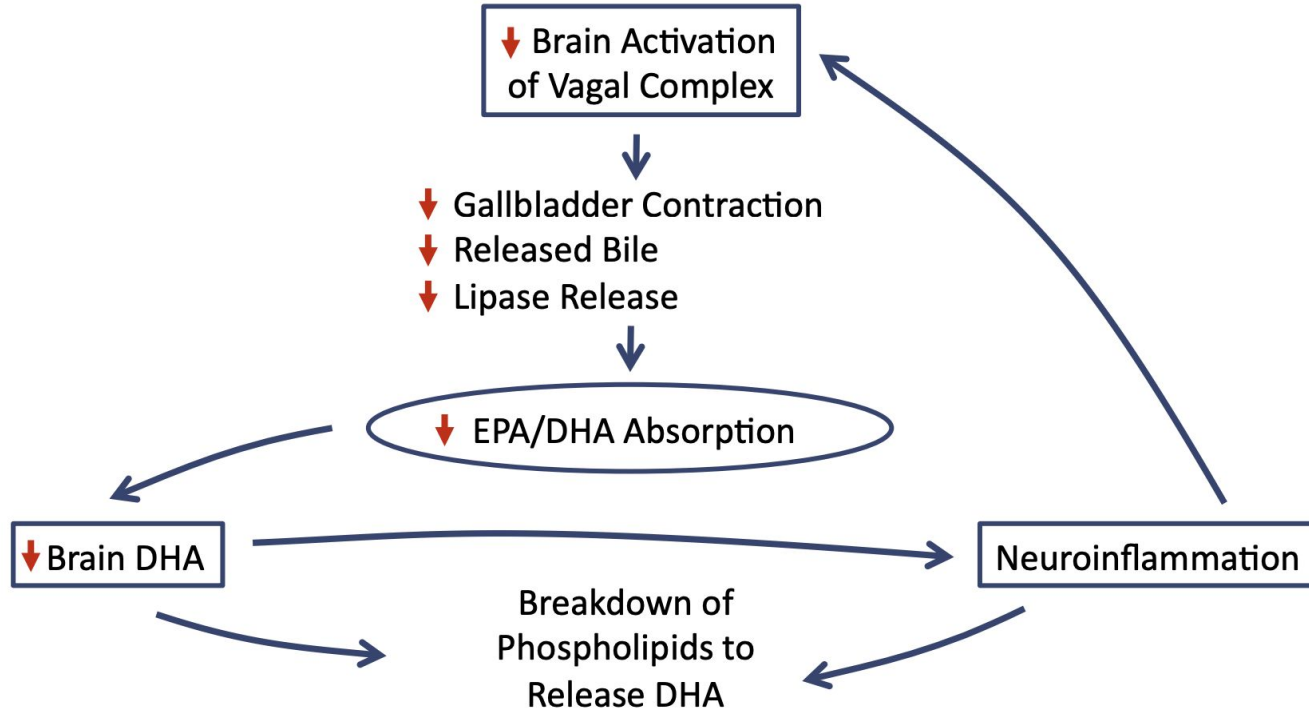
- Supports brain, neurologic, and vascular health*
- Plays important roles in the functioning of the brain and eyes*
- Supports healthy brain development and cognition*
- May support healthy neuronal activity in the hippocampus, an area of the brain critical for recent memory*
- Helps support neurons and brain tissue*
- By including the precursor DHA, helps the body endogenously form specialized proresolving mediators (SPMs)*



Benefits

- Also includes phosphatidylcholine and 153% of the reference daily value of vitamin E
- Mild taste with natural oils and a touch of sweetness from monk fruit (luo han guo)
- A great alternative for those who may have difficulty swallowing, such as the elderly
- Gluten and dairy free, as confirmed by finished-product testing

BRAIN-GUT AXIS AND EFA ABSORPTION



Symptoms of Bile Stasis

- Bloating after fatty or fried meals
- Burping after fatty meals or fish oils
- Referral visceral pain between the rhomboids after fatty meals
- Floating stool

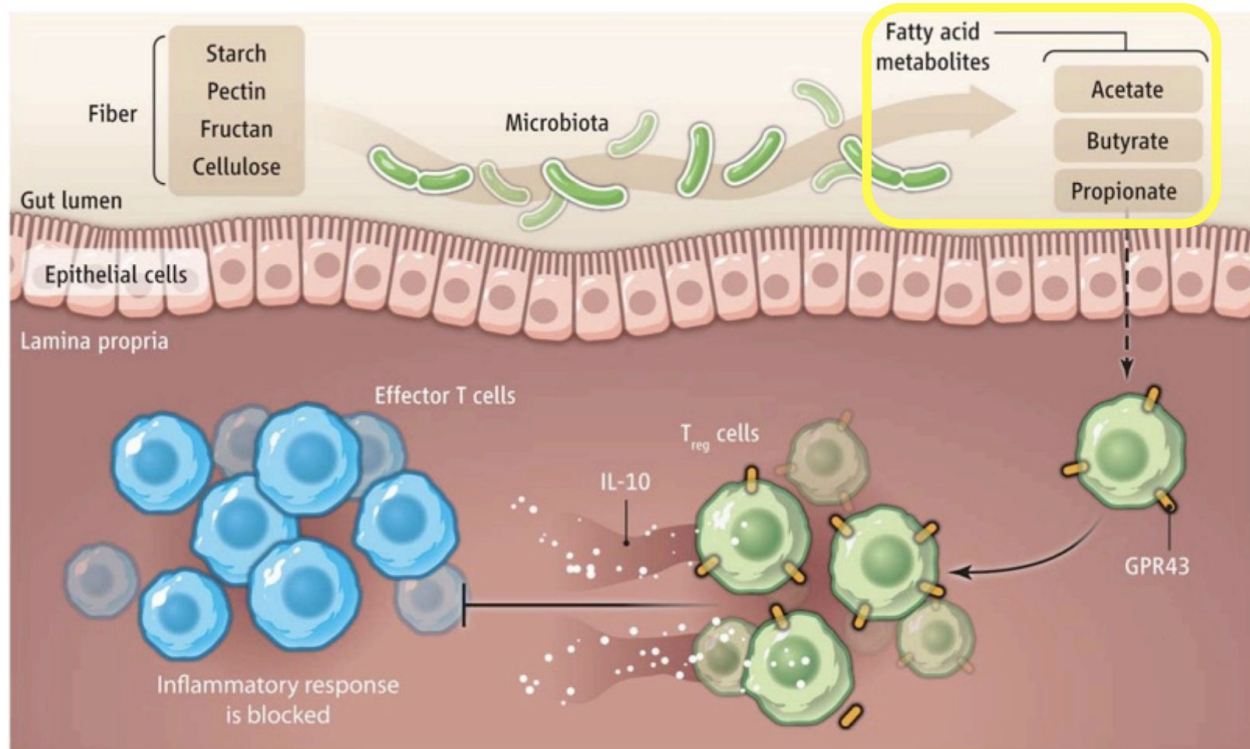


SCFA - short chain fatty acids

- Anti-neuroinflammation!!
- IL10 → switches glial cells to M2
- High fiber diet (diverse fibers), butyrate
 - Veggie mash-up, supplemental fibers
- Butyrate (and other SCFA) - #1 supplement to take
- Go slow with fibers
- Direct impact as SCFA - to M2
- Impacts via the small intestine also
- Oxidized LCFA → MI (fried, inflammatory, processed foods)

Science. 2013 Aug 2;341:463-464.

Feed your T-regs more fiber



EnteroVite™



 GASTROINTESTINAL*

EnteroVite™ represents the latest science in microbiota-related supplementation. It delivers short-chain fatty acids (SCFAs)—the natural end products (postbiotics) of complex carbohydrate digestion by enteric bacteria. An increasing number of studies demonstrate the broad and profound effects of SCFAs locally, in intestinal mucosal health and microbiota diversity, and systemically, as molecular messengers.*

Features

- Uses calcium beta-hydroxy beta-methyl butyrate, a form of butyrate, for maximum butyric acid delivery
- No sodium hydroxylate (lye), which is often incorporated with sodium butyrate
- Delivers not only butyrate but also propionate and acetate for broader activities



Benefits

- Supports microbiome diversity and the health and function of intestinal epithelial cells*
 - Supports intestinal tight junction protein synthesis, which is critical to intestinal barrier function*
 - Supports colonic T-regulatory cell activity and immune homeostasis to encourage immune tolerance*
 - Supports energy metabolism*
 - Supports NF-kappaB signaling and cytokine production associated with good health*
-

Vitamins and minerals

- None are great for NI
- D does work well - Magnesium also
- Others don't have a lot of effect (in the brain)
- Acute brain injury - IV magnesium, (glutathione, hyperbaric oxygen)
-

RATINGS OF VITAMINS AND MINERALS FOR NEUROINFLAMMATION

Vitamin D



Magnesium



Vitamin A
Vitamin E



B1



B2

B3

B5

B6

Zinc

Calcium





 IMMUNE SYSTEM*

 MUSCULOSKELETAL*

Price QTY

Liqua-D™ supports the immune system and the skeletal system by offering high-potency vitamin D (cholecalciferol) in a liquid form.* Each drop contains (2000 IU) 50 mcg of vitamin D, which is over 200% of the recommended daily value. Liqua-D™ allows healthcare professionals to conveniently adjust the vitamin D intake of those they care for.

Liqua-D™ includes only two ingredients—vitamin D and MCT oil (as a biologically active carrier)—to minimize the risk of sensitivities to this product. In addition to immune and skeletal support, this product may also support the balance of calcium and phosphorus.*

Benefits

- Includes a highly absorbable, high-potency, natural source of vitamin D*
- Hypoallergenic—formulated with **only** two ingredients, vitamin D and MCT (as a biologically active carrier), to minimize the risk of sensitivities
- Formulated to support the immune system*

D₃
Biologically
Active*


Liquid
Formula


Tested
for Gluten


Tested
for Dairy

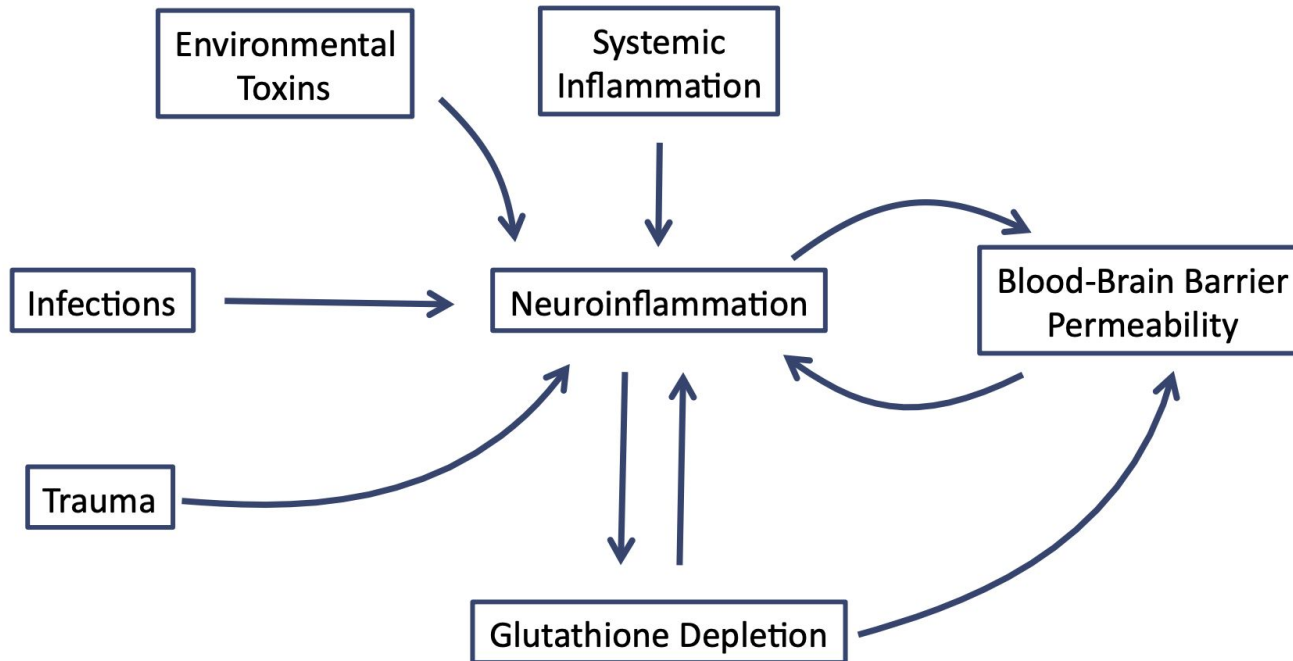
LiquiD

- 10-20,000 acute
- Check levels - <100 ideal
- Ultra D 5000 - A,D,K (all needed for the brain)

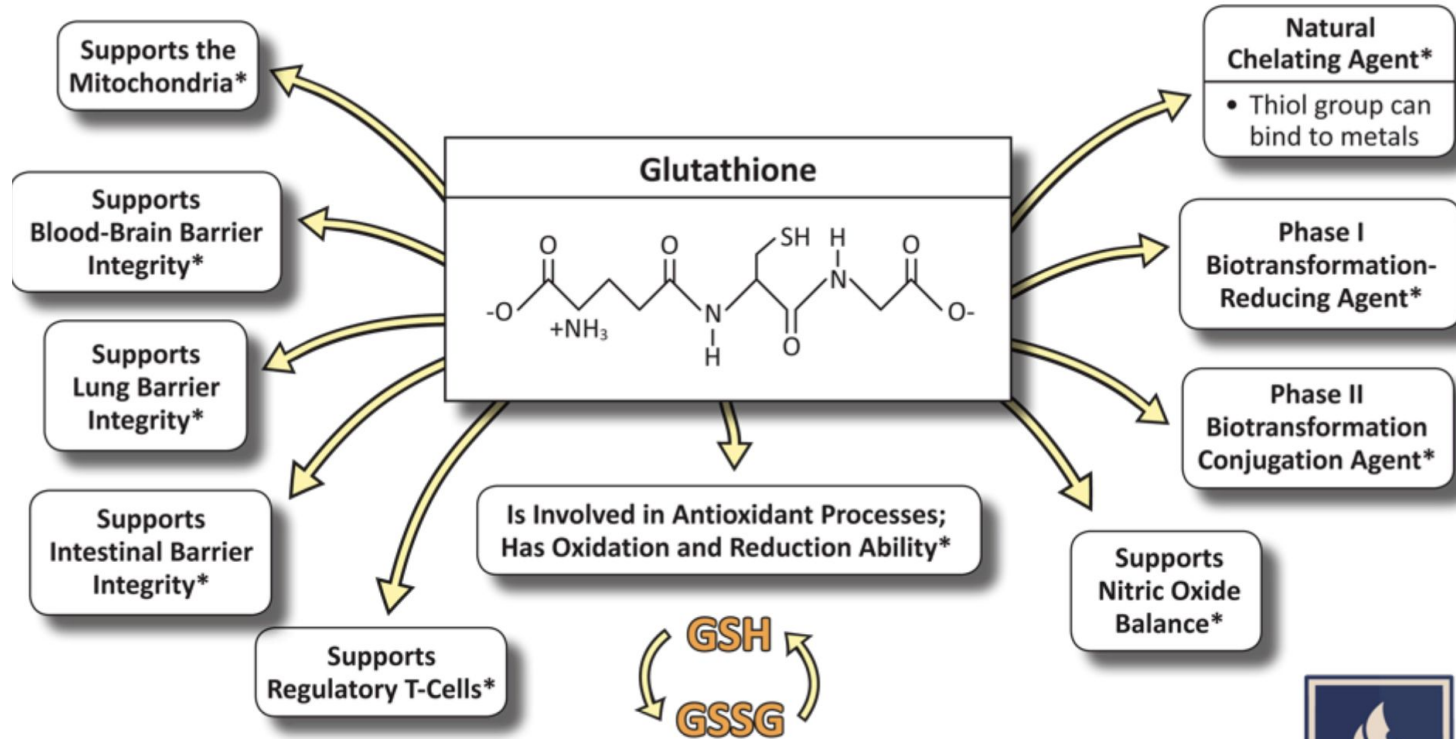
Glutathione

- Neurons mitochondria uncouples → creates free radicals → continues to destroy neurons → neurodegeneration
- Key - glutathione
- We get multiple hits on glutathione from the environment
 - When the BBB leaks - we lose glutathione
 - When the neurons die - we lose glutathione
- Liposomal glutathione is best
- NAC also increase glutathione

GLUTATHIONE AND NEUROINFLAMMATION



THE ROLE OF GLUTATHIONE IN IMMUNE-CHEMICAL TOLERANCE





Trizomal™ Glutathione is a breakthrough new approach to glutathione supplementation. It features, for the first time in a liposomal solution, S-acetyl L-glutathione (SAG), combined with reduced glutathione (GSH), and N-acetyl L-cysteine (NAC). This formulation utilizes three ways to support glutathione—intracellular with SAG, intracellular biosynthesis with NAC, and extra/intracellular (systemic) support with GSH.* Moreover, the liposomal S-acetyl L-glutathione in this formula provides a double layer (acetylation + liposomes) of protection to the glutathione molecule, further supporting its intracellular bioavailability.*

Features

- Gives the body three ways to increase and optimize glutathione levels*
- Gluten free and dairy free, as confirmed by testing
- Liposomes are composed of non-hydrogenated phospholipids, derived from GMO-free sunflower lecithin





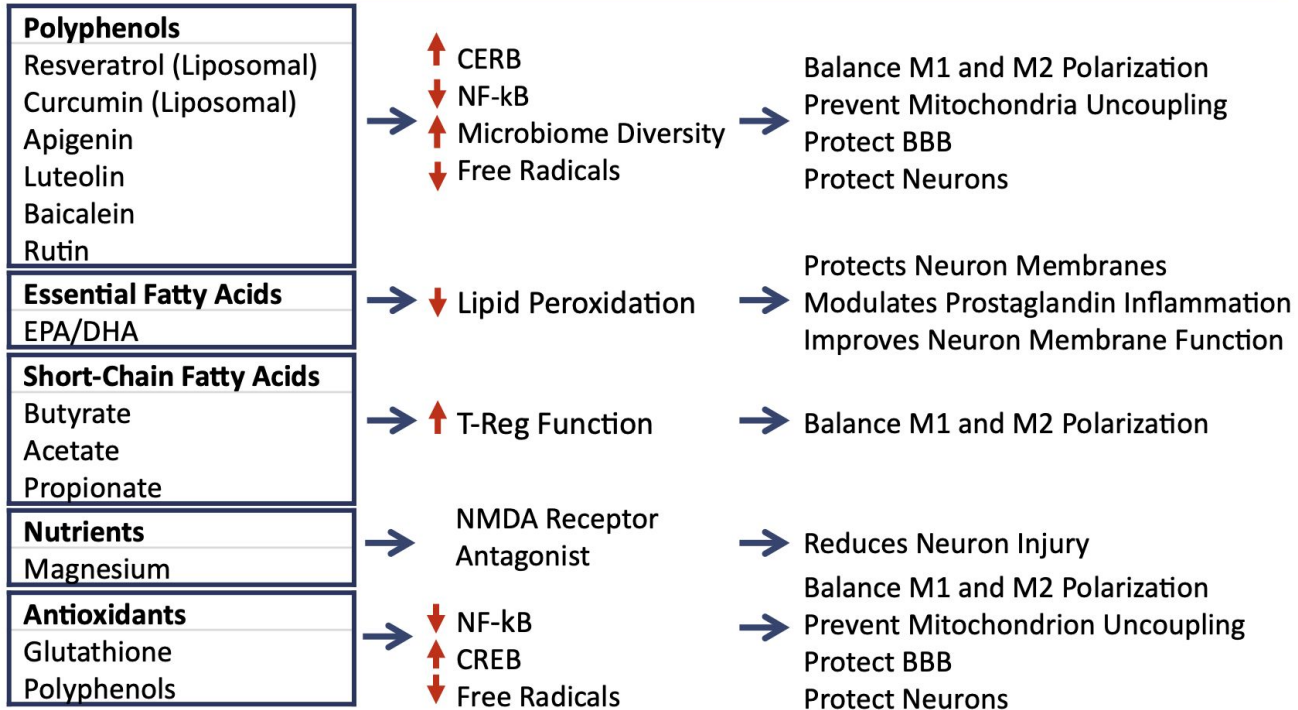
Glutathione Recycler™ is a first-of-its-kind formula designed to support the synthesis and recycling of glutathione, which is a key factor in cellular and mitochondrial antioxidant processes.* It strategically combines complementary ingredients, such as selenium, N-acetyl L-cysteine, and standardized extracts of cordyceps and gotu kola, that have cohesive actions geared toward optimizing intracellular glutathione.* A small size of Glutathione Recycler™ (K81), which contains 30 capsules, is also available.

Features

- Delivers high quality, whole plant and seed extracts for a spectrum of activity*
- Suitable for vegetarians
- Specially processed to avoid unnecessary ingredients
- Gluten and dairy free, as confirmed by finished-product testing



NUTRACEUTICAL MANAGEMENT OF NEUROINFLAMMATION



Deeper Dive