Claims for Detox Cocktail:

1. CLAIMS: Biotransformation
   
   Biotransformation consists of phase I and II.
   
   Phase I is the movement of electrons; requires antioxidants
   
   Phase II is the addition of a nutrient.
   
   Each nutrient in the High Tech Health Detox Cocktail has unique functions pertaining to the aforementioned phases.\(^1\), \(^2\), \(^3\), \(^5\), \(^7\)

2. Vitamin C
   
   Removes Toxins\(^1\), \(^5\), \(^8\)
   
   Antioxidant\(^9\)
   
   Rebuilds connective tissue\(^9\), \(^10\), \(^11\)
   
   Mitigates damage from free radicals\(^9\), \(^10\), \(^5\)
   
   Regenerates used antioxidants\(^9\), \(^10\)
   
   Supports phase I detoxification\(^1\)

3. Glutathione
   
   Cellular defense; protects all tissues
   
   Escorts toxicants out of the body; needed for optimal detoxification\(^3\), \(^12\)
   
   Combats accumulation of harmful xenobiotics\(^3\), \(^12\)
   
   Protects from phase I free radicals\(^3\), \(^12\)
   
   Acts as a conjugate in phase II detox and antioxidant in phase I\(^3\), \(^14\)
   
   Regenerates other antioxidants\(^12\)
   
   Oral liposomal GSH supplementation causes significant increases in GSH plasma levels and lesser increase, but not significant in whole blood levels\(^15\) in children with Autism Spectrum disorders.
   
   Stores and transports nitric oxide within the cell\(^3\)
   
   Chelates heavy metals due to heavy metal's affinity for sulfur\(^8\)
4. **Phosphatidylcholine**

- Protects liver cells\(^7,16\)
- Supports detoxification\(^7,16\)
- Aids in detox of ethanol and carbon tetrachloride\(^7,16\)
- Rebuilds phospholipids in cell membranes\(^7,16\)
- Building block for healthy liver cells\(^7\)

5. **Liposomes**

Liposomals are more likely to protect the nutrient payload for delivery into the cell, blood, tissue\(^15,17,18\).

Bioavailable and biocompatible\(^17\)

Liposomal encapsulation provides efficient delivery to the cell:
- Protects nutrient from acid and digestive enzymes\(^17\)
- Enhanced cellular uptake\(^18\)

Nutrients in non-liposomal supplements have barriers to absorption and cellular delivery:
- Destroyed by stomach acid & digestive enzymes\(^17\)
- Limited uptake in the gut (NIH)
- Limited uptake by target cell vs. liposomes, target organs with discontinuous endothelium, such as the liver, spleen, and bone marrow

Amphipathic: fat and water soluble
- Can pass the blood brain barrier\(^19,18\)
- Liposomes with PC with SFA are most stable in the blood\(^17\)

Neutral liposomes have the longest \(\frac{1}{2}\) life in the blood, positively charged have the shortest, and negatively charged have a mid-rang \(\frac{1}{2}\) life\(^17\)

**Alpha-Lipoic Acid**

- Binds (chelates) and removes, heavy metals\(^8\)
- Master antioxidant recycler\(^8\)
- Recovers antioxidants GSH, vitamin C and E\(^20,21\)
- Contains sulfur\(^21\); supports phase II detox pathways\(^8\)
Antioxidant properties buffer the oxidative stress from phase I detox\textsuperscript{21} 

Crosses blood-brain barrier, cellular membranes\textsuperscript{8}

HTH, R-LA in salt-stabilized\textsuperscript{1} form is most bioavailable\textsuperscript{22}

ALA increases intracellular GSH levels and CoQ10 levels\textsuperscript{21}

**High Tech Health Liposomes**

Amphipathic microscopic spheres

Compatible with fat- and water-based tissues

Holds vitamin C, salt-stabilized R-LA, and GSH in protective center

100% PC-based liposomes

Optimal size requirements; ideal ratio of PC-to-nutrient payload

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An evaluation of the stability and plasma pharmacokinetics of R-Lipoic acid (RLA) and R-dihydrolipoic acid (R-DHLA) dosage forms in human plasma from healthy volunteers. # 43 in the plasma kinetics research may be a good study to have as it is a clinical trial with humans. I requested it from the authors; it’s not online as far as I could find.
SUBSTANTIATION:


