MAJOR PLAYERS IN BIOAVAILABLE COPPER

Our goal with our clients is to increase bioavailable copper in order to decrease the accumulation of unbound iron in your body, while simultaneously reducing your body's magnesium burn rate, meaning the rate at which your body's supply of magnesium is depleted, or burned up. By accomplishing this, our protocol repairs the mineral imbalances that are root causes of both persistent fatigue and nearly all other health challenges you may face.

Our protocol is designed to help the body make the copper-dependent protein ceruloplasmin and empower its *ferroxidase* enzyme activity in order to reduce oxidative stress and inflammation. in a healthy body, among many enzyme functions, enables peroxidase function.

***Ferroxidase*, the active form of ceruloplasmin, is the enzyme that regulates, or chaperones, iron and prevents it from allowing oxidation** (rusting) **to occur. Peroxidase is the master antioxidant enzyme that regulates iron status in the body. Dysregulated, unbound iron is the greatest source of oxidative stress and inflammation in the body.**

Remember: Bioavailable copper converts toxic various iron into beneficial ferric iron.

Without enough bioavailable copper, unbound toxic ferrous iron runs around the body like a four year old with a hammer, causing oxidative stress and inflammation, which are the root causes of virtually all health challenges.

Therefore our protocol is to increase bioavailable copper, which will minimize oxidative stress and, ultimately, minimize the magnesium burn rate.

Copper:

Copper is responsible for many profound functions in the body and is principally focused on creating energy via cytochrome C oxidase, and clearing exhaust within a network of antioxidant enzymes, the body's integrated antioxidant system. But in order for copper to be able to perform its functions, it must be bioavailable, meaning that it needs to be properly integrated or complexed, within a network of proteins especially ceruloplasmin and enzymes. 95% of copper in the blood is complexed and ceruloplasmin.

However, for copper to be loaded in ceruloplasmin, we need the critical involvement of retinol, which is an essential nutrient for this process. Our protocol ensures that you obtain enough retinol for it to do its job.

Ceruloplasmin:

Ceruloplasmin was discovered in the early 1940s by the Swedish physiologists Carl G. Holmberg And C. B. Laurell and first described in their article published in 1948. Since its discovery, ceruloplasmin has been revealed to be the master multi copper protein. It has an "active" and an "inactive" state or is measured via its enzyme activity or its level of immunoreactive protein.

In its "active" state, ceruloplasmin contains up to 8 copper atoms, several of which surround a molecule of oxygen. But unfortunately, only the level of the "inactive state" is measured by commercial labs using the serum ceruloplasmin blood test. Outside of research studies, there are no commercial labs that measure the "active" state. Our protocol however sure that ceruloplasmin activity and properly complexes the needed copper for its many enzyme and regulatory actions.

Ferroxidase:

Ferroxidase is one of the key "active" or "enzyme" forms of ceruloplasmin. Ferroxidase is the master antioxidant enzyme in the human body. Most importantly, it regulates iron and prevents it from causing oxidative stress, AKA "rust," in the body's tissues and organs. Ferroxidase has the highest amount of activity in the liver and the brain, and is also notably active in our intestines, where it is expressed through a protein called *hephaestin*, and, in pregnant women, and the placenta, this enzyme is expressed through the protein *zyklopen*.

Without optimal fair oxidase enzyme activity, iron starts to build up in our tissues, especially in our liver cells and endocrine glands. As we age, this chronic buildup of iron leads to decreased energy production in the cells and increased inflammation in our tissues and organs.

Increasing the amount of ceruloplasmin in the body and the activity of the Ferroxidase enzyme is the priority focus of the recommended steps in our protocol. By increasing ceruloplasmin and ferroxidase action, we decrease iron dysfunction, we increase the potential to activate oxygen for energy production, and we stopped the chronic loss of magnesium.

Magnesium:

This mineral, is responsible for 3,751 essential enzyme functions in the body. Among its many functions, magnesium regulates calcium homeostasis through the activity of three key hormones: *calcitonin*, *parathyroid hormone*, and *vitamin D* (more properly called hormone D)**. In addition, magnesium's preference in the energy molecule** (Mg-ATP) **it is an absolute requirement for its recognition and use in the body. We consider magnesium to be the conductor of the body's mineral orchestra.**

Magnesium Burn Rate:

Under any form of stress to the body (physical, emotional, metabolic, environmental, etc.)**, magnesium is lost as a metabolic response, because when the body is under stress, it needs to produce more energy** (Mg-ATP)**, which requires it to call upon its magnesium stores. Under extreme and/or sustained stress—and a failure in properly remineralize—the body loses its natural ability to respond to stress, causing oxidative stress and inflammation to build up throughout the body. Magnesium deficiency, meaning low magnesium levels in red blood cells where magnesium belongs, is the recognized precursor to inflammation.**

Retinol:

Retinol is the naturally occurring, animal-based, whole-food form of fat-soluble vitamin A. It is found in cod liver oil, beef liver, butter from grass fed cows, and other animal based foods. Retinal is vital for "loading" copper into ceruloplasmin, so that it can then regulate Iron as needed throughout the body, help preventing it from causing inflammation and oxidative stress.

You don't have to fully understand it for this protocol to work for you, any more than you have to truly know how electricity works to get the benefit of turning on a light switch in the dark. Though the biochemistry involved in the protocol may seem complex to you, putting it to use is actually quite simple, though it does require a commitment on your part if you want it to truly work for you.