



SelenoExcell® HSY 1200 / Form & Function

Function

Selenium (Se) is an essential trace mineral. It is unique as its inclusion in proteins is specified in the genetic code, as part of selenocysteine (SeCys), which has been recognized as the 21st amino acid.

A large number of studies have shown that insufficient Se levels, and particularly Se-proteins, are associated with several human diseases including cancer, cardiovascular and immune system disorders. In most cases, the link lies in the oxidative stress caused by free radicals damage. We have all heard of the anti-aging benefits of antioxidant consumption.

- Most Se-proteins participate in antioxidant activity and redox-state regulation, particularly the family of **Glutathione Peroxidase (GPxs)** that act as our natural first line of defense against free radicals.
- Free radicals are unstable atoms that are well known for causing harm in a wide range of tissues. These molecules are associated with diseases such as cardiovascular; immune and cognitive impairment; cancer and an overall worsening of the aging process.
- In the 1970s it was discovered that selenium is an integral part of GPx enzymes. Without selenium GPX would not function and perform its free radical elimination function to reduce oxidative stress. The research community refers to GPx as “selenium dependent.”
- Twenty-five Se-proteins have been identified so far in humans, but the mechanism of action of some of them is still unknown. In addition to the GPx family, the Thioredoxin Reductases (TrxRs) intervene in redox-state regulation. Other Se-proteins play a more specific function, like the Iodothyronine Deiodinases (DIOs) that are involved in the vital thyroid hormones metabolism.

Form

When it comes to selenium, “**Form Makes a Difference**”. Not all forms of selenium are created equal, nor do they function the same in the body:

- **Inorganic Salts** – Selenite/Selenate. These can be found in the soil or produced by chemical synthesis. In a number of studies, the bioavailability of Se from Se-enriched yeast and the bioavailability of SeMet from food have been shown to be approximately 1.5 to 2-fold higher than that of inorganic salts. The reported average whole-body half-lives of SeMet and selenite in humans are 252 and 102 days, respectively, indicating that SeMet is extensively used and re-utilized in the body. Toxicity has also been proven higher than organic, food-forms of Se.
- **L-Selenomethionine (SeMet)** – The synthetic version of this compound is widely used in supplements, despite the evidence that resulted from the SELECT Trial, the largest cancer chemoprevention trial ever conducted. It demonstrated that oral supplementation of synthetic L-SeMet for 5 years, Vit E (α-tocopherol acetate, 400 IU) or Se+Vit E did not prevent prostate cancer in the generally healthy, heterogeneous population of 35,000 men. Furthermore, it proved to be detrimental. This served as evidence that an isolated Se compound cannot excerpt the benefits showed by yeast.
- **High Selenium Yeast (HSY)** – Following the Journal of American Medical Association (JAMA) publication of the Nutritional Prevention of Cancer Trial (NPC) in 1996, which showed 48% to 63% reduction in colon, lung and prostate cancer with an overall 50% reduction in all cancers, the National Cancer Institute (NCI) required the standardization of the HSY used in the trial (now trademarked SelenoExcell®) before funding confirming research. This was due to the fact that there were and still are many adulterated forms of HSY in the market:

HSY Adulterated Forms

- Brewer's yeast blended with sodium selenite.
- Abbreviated fermentation and washing of HSY resulting in free inorganic selenium.

SelenoExcell Standardization with NCI

- 100% organically bound selenium
- Minimal variation from target potency of 1200 mcg/gram
- Minimal batch to batch variation
- Selenium Speciation “Fingerprint”