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Selenoprotein P (SELENOP)



selenOtest ELISA for the quantitative determination of selenoprotein P in human serum

- Selenoprotein P – Established biomarker for functional selenium status
- Supports the differentiated assessment of selenium supply – selenium deficiency or selenium excess?
- Monitoring of selenium substitution

Selenoprotein P (SELENOP)

Selenium is a vital trace element and plays a central role in the body. It supports antioxidant cell protection, strengthens the immune system and is essential for the synthesis of thyroid hormones, such as active triiodothyronine [1]. An optimal selenium supply also plays a decisive role during pregnancy and in the case of infections [2]. The body primarily absorbs selenium through diet, with selenium-rich foods such as fish, meat, eggs, and dairy products serving as key sources.

The challenge of selenium supply

Europe and large parts of Asia and Africa are considered to be areas with a low selenium supply – which is why plants contain little selenium. Although meat, fish and Brazil nuts, for example, provide more selenium, the diet is often not sufficient to cover the recommended daily requirement.

While the D-A-CH reference values (set by professional associations in Germany, Austria and Switzerland) are 30–70 µg/day, studies show that around 100 µg daily are necessary for optimal SELENOP function [3]. According to ESPEN (*European Society for Clinical Nutrition and Metabolism*), recommendations even exceed 200 µg/day in cases of deficiency or physical trauma.

SELENOP – the key to selenium metabolism

SELENOP is a specialized protein primarily responsible for transporting and distributing selenium from the liver to peripheral tissues, particularly the brain and endocrine glands, which have a high selenium demand. Additionally, SELENOP possesses antioxidant and protective properties, helping to safeguard cells from oxidative stress [4].

Consequences of an imbalanced SELENOP supply

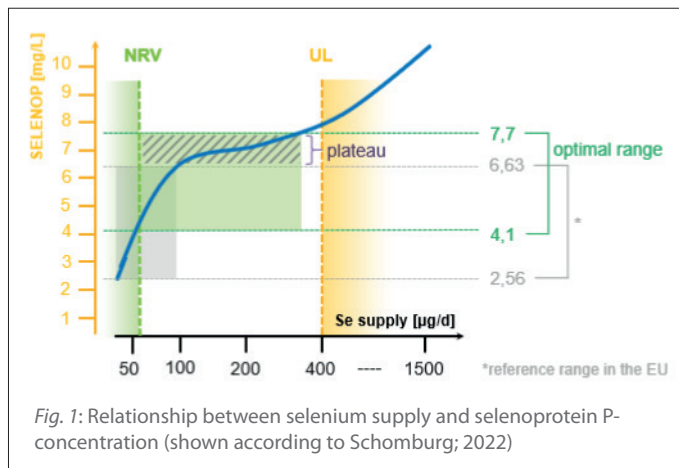
A **SELENOP deficiency** can impair the immune system, thyroid function and cognitive and musculoskeletal performance. It also increases the risk of cardiovascular disease and certain tumors (liver, intestine, kidney) [5].

A **SELENOP excess** can indicate selenium poisoning (selenosis), which can manifest itself through nausea, hair loss, brittle nails and neurological symptoms such as tingling or concentration disorders [6].

If the body is deficient in selenium, SELENOP levels are low, indicating a selenium deficiency. With adequate selenium supply, SELENOP stabilizes at a consistent level, remaining unchanged even with higher selenium intake within this range. The concentration of SELENOP only increases again when selenium intake exceeds the recommended upper limit (UL) (see Fig. 1). In the EU, the official reference range is sometimes lower than the recommended nutrient value (NRV). Based on recent studies, the optimal SELENOP range has been determined to be 4.1 to 7.7 mg/L [4, 5, 7].

Literature:

- [1] Rayman MP (2000) The importance of selenium to human health. *Lancet* 356(9225):233-41
- [2] Mücke R et al. (2021) Selenium Status Should Be Assessed. *Dtsch Arztebl Int* 118(8): 133
- [3] Razaghi A et al. (2021) Selenium stimulates the antitumour immunity: Insights to future research. *Eur J Cancer* 155:256-267
- [4] Schomburg L (2022) Selenoprotein P - Selenium transport protein, enzyme and biomarker of selenium status. *Free Radic Biol Med* 191:150-163
- [5] Schöttker B et al. (2024) Strong associations of serum selenoprotein P with all-cause mortality and mortality due to cancer, cardiovascular, respiratory and gastrointestinal diseases in older German adults. *Eur J Epidemiol* 39(2):121-136
- [6] Brodin O et al. (2020) Selenoprotein P as Biomarker of Selenium Status in Clinical Trials with Therapeutic Dosages of Selenite. *Nutrients* 12(4):1067
- [7] Schomburg L et al. (2019) Selenoprotein-P Deficiency Predicts Cardiovascular Disease and Death. *Nutrients* 11(8):1852



Both deficiency and excess impair vital bodily functions. **Regular monitoring of selenium status provides valuable insights into individual nutrient levels, enabling targeted, personalized supplementation. This helps support overall health and contributes to the prevention of degenerative processes** [1].

selenOtest ELISA

The selenOtest ELISA is an enzyme-linked immunosorbent assay for the quantitative determination of selenoprotein P in human serum.

The test is an *in-vitro* diagnostic medical device and is intended for manual and automated use by professional users in a laboratory environment.

It serves to monitor the functional selenium status of individuals with suspected selenium deficiency or excess and can also be used as an aid in the differentiated assessment of selenium status in the context of selenium deficiency therapy through selenium supplementation.

Test description

Cat. No.	YC5900
Matrix	Serum
Sample volume	100 µl
Incubation time	45 min; 30 min; 25–30 min
Regulatory status	CE (IVDR certified)

IDK® ELISA

For laboratory professional use only.



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