PROTOCOL FOR LIFE BALANCE®

Dietary Supplement Information
for Physicians with Naturokinetics®
PRODUCT CODE: P0085
CATEGORY: AMINO ACIDS/HEALTHY AGING*

NAC N-Acetyl-Cysteine 600 mg

TECHNICAL SUMMARY

How it Works:

N-acetyl-cysteine (NAC) is a stable form of the non-essential amino acid cysteine. Cysteine is a sulfur-containing amino acid that acts as a stabilizer for the formation of protein structures.* Although NAC possesses its own free radical scavenging activity, its primary function in the body is to supply cysteine necessary for glutathione synthesis and replenishment.* This unique formula also contains selenium, a trace mineral that supports glutathione production.*

Structure formula:

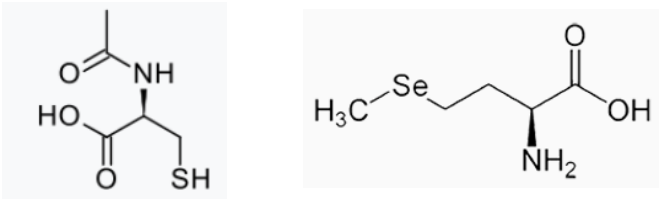

Figure 1: N-Acetyl-Cysteine (NAC) (left) and L-Selenomethionine (right)

Chemical name:

N-Acetyl-Cysteine: (2R)-2-acetamido-3-sulfanylpropanoic acid.

L-Selenomethionine: (S)-2-Amino-4-(methylseleno) butanoic acid.

Allergen and Additive Disclosure: Not manufactured with wheat, gluten, soy, milk, egg, fish, shellfish, tree nut or sesame ingredients. Produced in a GMP facility that processes other ingredients containing these allergens.

Delivery Form: Capsules

ROLE AS NUTRIENT/FUNCTION

NAC and selenium are vital components of cellular functions, aimed at reducing oxidative stress and supporting the optimal function of essential intracellular enzymes.*

NATUROKINETICS®

Liberation: The disintegration of the vegetable capsule using a USP testing method of disintegration in water occurs between zero and 60 minutes.

Absorption: After oral administration, NAC is absorbed in the stomach and intestine, with an oral bioavailability of 9.1% and a half-life of 6.25 hours. L-selenomethionine is absorbed almost entirely in the small intestine, with an absorption rate of over 90% via the same mechanism as methionine. The bioavailability of selenium from L-selenomethionine has been shown to be approximately 1.5 to 2 times higher than that of inorganic forms of selenium.

Distribution: NAC is primarily distributed in the kidney and liver, with other sources in the adrenal gland, lungs, spleen, blood, and brain. Once absorbed, selenium from L-selenomethionine is incorporated into a long-term body pool. Selenium is integrated into tissue proteins, such as in skeletal muscle, liver, erythrocytes, and plasma albumin, which can subsequently be released as needed to maintain selenium status.

Metabolism: NAC is metabolized in the intestinal wall, liver, and kidney into cysteine, glutathione, and inorganic sulfite. Following absorption, L-selenomethionine is metabolized into other forms of selenium such as hydrogen selenide and/or incorporated into methionine pathways and stored as selenoproteins.

Elimination: Approximately one-third of the orally administered NAC is eliminated in the urine within 24 hours of ingestion. The half-life of L-selenomethionine is approximately 252 days. Metabolites of selenomethionine are excreted in urine, but when high quantities of selenium are present in the body, a volatile metabolite, dimethylselenide, is formed and excreted via respiration.

Supplement Facts

Serving Size 1 Capsule

	Amount Per Serving	% Daily Value
Selenium (elemental) (from 5 mg L-Selenomethionine)	25 mcg	45%
N-Acetyl-Cysteine (NAC)	600 mg	†

† Daily Value not established.

Other ingredients: Hypromellose (cellulose capsule), Stearic Acid (vegetable source), Citric Acid and Microcrystalline Cellulose.

- **Maintains Cellular Health***
- **With Selenium**

SUGGESTED USAGE: Take 1 capsule twice daily, or as directed by your healthcare practitioner.

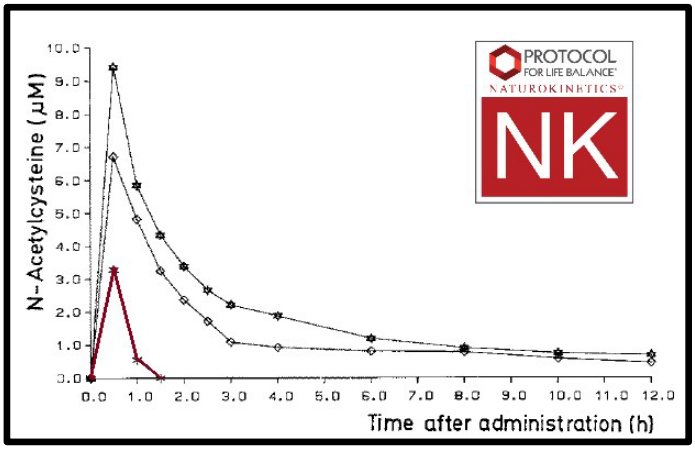

Figure 2: Plasma concentration of reduced NAC (stars), NAC as mixed disulphides (diamonds), total NAC (red) after oral administration of 400 mg NAC.

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

CLINICAL VALIDATION

NAC supplementation and its free radical scavenging properties have been extensively researched in clinical studies.*

- In a randomized, multicenter, placebo-controlled, double-blind study involving 262 healthy individuals, NAC was taken at the dosage of 600 mg twice daily beginning in the fall season for 6 months. Cell-mediated immunity was evaluated by performing antigenic skin applications at months 1, 3, and 6. Volunteers in the NAC group presented different skin reactions at 6 months after antigenic presentation when compared to placebo, confirming clinically the immunomodulating properties of NAC.*
- In a randomized, placebo-controlled study, with 55 healthy, trained, young adults receiving 1.9 g per day of NAC for 3 days and performing intensity resistance exercises, it was demonstrated that NAC increases a P/A ratio determined from the values of TBARS, SOD, GPX, and CAT.* A higher P/A ratio leads to a more significant defense against oxidative stress.*

SAFETY INFORMATION

Tolerability: High intakes of NAC may trigger gastrointestinal discomfort; however, whoever, in clinical studies, 600 mg NAC taken twice daily is generally well-tolerated.

Contraindications: NAC is contraindicated in individuals with an allergy to acetylcysteine.

INTERACTIONS

Drug Interactions: NAC may reduce the capacity of activated charcoal to absorb acetaminophen and salicylic acid. Administration of NAC while taking nitroglycerin may cause hypotension and headaches. Preliminary evidence suggests that selenium may impact blood coagulation by increasing bleeding time. Individuals taking anticoagulants, such as warfarin or antiplatelet medications should exert caution when initiating selenium supplementation, especially before surgery. Some studies suggests that selenium might inhibit the hepatic metabolism of barbiturates, which could theoretically prolong their sedative effects.

Supplement Interactions: Supplements affecting platelet aggregation and coagulation should be used with caution when taking selenium supplements. Some food and herbal ingredients may accumulate large amounts of selenium and could theoretically lead to selenium accumulation in the body. Vitamin C may theoretically decrease the absorption of selenium for some supplements. Preliminary research suggests that zinc may also reduce selenium absorption.

Interaction with Lab Tests: NAC supplementation may affect serum chloride, lipoprotein A, liver enzymes, and urine ketone test results. Excessive selenium intake may result in altered tests results, such as elevated total cholesterol, non-HDL lipoprotein levels, creatinine kinase levels, and modifications of EKG (ST segment elevation and T-wave changes). Excess selenium may impact thyroid function by lowering thyroxine (T4) levels, which can be clinically significant if other factors such as iodine deficiency are not contributing to thyroid dysfunction.

STORAGE

Store in a cool, dry place.