

NAC (N-Acetyl-L-Cysteine)

NAC — N-Acetyl-L-Cysteine, an acetylated form of cysteine, is readily absorbed to immediately provide an efficient precursor of cysteine for continued glutathione (GSH) synthesis.

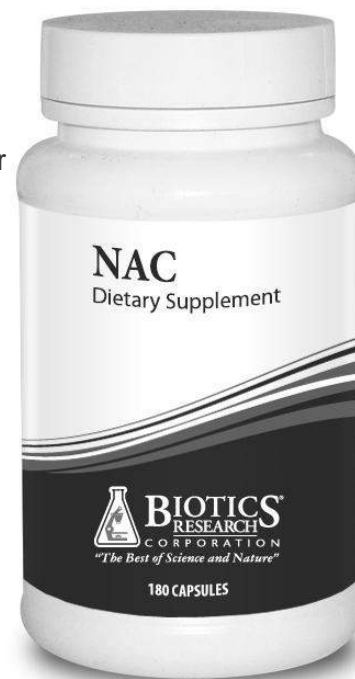
The amino acid cysteine in its pre-acetylated form is known as N-Acetyl-L-Cysteine. It is essential for glutathione synthesis as it serves as the precursor to glutathione intracellular synthesis.^(1, 2) Glutathione is a critical component of the immune system, as it is an important intracellular water-soluble antioxidant. As part of this function, glutathione plays a vital role as the cofactor for the antioxidant enzymes glutathione peroxidase and glutathione transferase. Glutathione is also important to the liver, as the liver utilises it for drug detoxification. As a metabolite of cysteine, **NAC** plays an important role in detoxification. As a more stable form of L-Cysteine, **NAC** functions in protecting cells against oxidative stress.⁽³⁾ Additionally, **NAC** contributes to important bodily reactions, making it a part of a defensive mechanism toward potential carcinogens as well as against DNA damage. The role of **NAC** in acetaminophen toxicity is widely documented, however, **NAC** contributes to other protective mechanisms, including drug conjugation and excretion, peroxides and free radical destruction, maintenance of the redox state of NADPH-NADP, acid-base balance, and the synthesis of sulphated compounds.⁽⁴⁾ **NAC** also plays a role in the development of the central nervous system.⁽⁵⁾

The protective method of **NAC** has been attributed to its:

- Nucleophilicity, antioxidant activity
- Modulation of the metabolism
- Effects in the mitochondria

- Decrease in the biologically effective dose of carcinogens
- Modulation of DNA repair
- Inhibition of genotoxicity and cell transformation
- Modulation of gene expression and signal transduction pathways
- Regulation of cell survival and apoptosis
- Anti-inflammatory activity and anti-angiogenic activity
- Immunological effects
- Inhibition of cellular dysfunction
- Influence on cell cycle progression
- Inhibition of hypercellular growth
- Inhibition of invasion and abnormal cell proliferation
- Ability to block NF-kappaB activation⁽⁶⁾
- Protection against the adverse effects of chemopreventive and chemotherapeutic agents⁽¹⁾

There have been numerous studies using **NAC**, with COPD, particularly amongst patients who smoke. Utilising **NAC** in smokers with chronic bronchitis showed a significant reduction in the number of positive bacterial cultures in these patients.⁽⁷⁾ An additional six-month study demonstrating the effects of **NAC** on chronic bronchitis indicated a significant reduction in sick-leave days for the **NAC** group, compared to placebo. Another study utilising **NAC** indicated potential benefits for chronic bronchitis, resulting in a significantly lower exacerbation rate in patients administered **NAC**,



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compared to placebo.⁽⁸⁾ In the group administered **NAC**, 40% remained free from exacerbations, compared to 19% in the placebo group. The study also indicated that the sick-leave rate due to exacerbation in the **NAC** group was significantly infrequent.⁽⁹⁾

NAC has also been shown to be radioprotectant against oxidative damage.⁽¹⁰⁾ Additionally, researchers have sited the beneficial use of **NAC** for the improvement of insulin sensitivity in women with polycystic ovary syndrome (PCOS), noting a significant improvement in circulating insulin levels, as well as insulin sensitivity in these patients.⁽¹¹⁾

Since it easily passes through cellular membranes, **NAC** has been shown to be readily absorbed. It is also resistant to enzymatic breakdown and is important for cellular glutathione production⁽¹²⁾

NAC supplies 500mg of N-Acetyl-L-Cysteine per tablet.

References

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¹⁰ Neal R, Matthews RH, Lutz P, Ercal N. Antioxidant Role of N-Acetyl cysteine isomers following high dose irradiation. *Free Radic Biol Med.* 2003 Mar 15;34(6):689-95.

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Nutrition Facts

Serving Size: 1 Capsule

	Amount Per Serving
N-Acetyl-L-Cysteine	500 mg*

* NRV not established

Other ingredients: Capsule shell (gelatine and water).

This product is gluten and dairy free.

RECOMMENDATION: One (1) capsule each day as a dietary supplement or as otherwise directed by a healthcare professional.

KEEP OUT OF REACH OF CHILDREN

Store in a cool, dry area.

Sealed with an imprinted safety seal for your protection.

Product # 5205 Rev. 05/13



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