

# NAC

600 mg / Glutathione Precursor for Antioxidant Protection



## DESCRIPTION

NAC is a biologically active precursor for the amino acid cysteine which, in turn, is a precursor for glutathione, a tripeptide with antioxidant properties.

## FUNCTIONS

Body cells and tissues are threatened continuously by damage caused by toxic free radicals and reactive oxygen species (e.g., peroxides) which are produced during normal oxygen metabolism, by other chemical reactions, and by toxic agents in the environment. Free radicals, once formed, are capable of disrupting metabolic activity and cell structure. When this occurs, additional free radicals are produced which, in turn, can result in more extensive damage to cells and tissues. The uncontrolled production of free radicals is thought to be a major contributing factor to many degenerative diseases.

NAC is a precursor for the sulfur amino acid cysteine, and cysteine is used by the body to synthesize glutathione. Glutathione is a naturally occurring tripeptide which is a major component of two anti-free radical enzymes: glutathione peroxidase and glutathione reductase. As such, glutathione offers one mechanism for scavenging toxic free radicals and inhibiting peroxidation thereby slowing down freeradical catalyzed chain reactions. Glutathione per se is well absorbed in the intestine, and enters the blood and other extracellular compartments where it exerts much of its beneficial antioxidant effects. However, it cannot effectively enter the cell. In contrast to glutathione, NAC is efficiently transported into the cell where it is readily converted to cysteine for glutathione synthesis. Thus, supplementation with NAC can raise intracellular glutathione levels.

Providing supplemental cysteine to elevate intracellular glutathione levels is generally not advised due to cysteine's inherent toxicity. NAC is virtually non-toxic and well absorbed, which is why supplementation with NAC is recognized as a safe, highly effective method of increasing intracellular glutathione stores.

Aside from providing cysteine as a glutathione precursor, NAC also appears to have antioxidant properties as such, and is a valuable sulfur donor for various metabolic needs. Current research also suggests that oral NAC may prevent acute exacerbations of chronic bronchitis and decrease associated morbidity.

## INDICATIONS

NAC 600 mg capsules may be a useful nutritional supplement for individuals who wish to increase their intake of cysteine-derived antioxidants. To effectively increase both extracellular and intracellular glutathione levels, this product and glutathione may be taken concurrently.

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.

## FORMULA (WW #10228)

### 1 Vegetarian Capsule Contains:

Selenium (as L-selenomethionine) ..... 70 mcg  
Molybdenum (as amino acid chelate) ..... 75 mcg  
N-Acetyl Cysteine..... 600 mg  
Other Ingredients: Capsule (cellulose, water), cellulose, magnesium stearate, and silica.

N-Acetyl Cysteine, Selenium and Molybdenum are important building blocks for antioxidant enzymes produced by the liver.

This product contains NO sugar, salt, dairy, yeast, wheat, gluten, corn, preservatives, artificial colors or flavors.

## SUGGESTED USE

As a dietary supplement, adults take 1 vegetarian capsule, 2 to 4 times daily between meals or, as directed by a healthcare professional.

## SIDE EFFECTS

No adverse effects have been reported.

## STORAGE

Store in a cool, dry place, away from direct light. Keep out of reach of children.

## REFERENCES

- Aruoma, OI, Halliwell, B, Hoey, BM, Butler, J. The antioxidant action of N-acetylcysteine: its reaction with hydrogen peroxide, hydroxyl radical, superoxide, and hypochlorous acid. *Free Radic Biol Med* 1989;6:593-7.
- Ben-Ari, Z, Vaknin, H, Tur-Kaspa, R. N-acetylcysteine in acute hepatic failure (non-paracetamol-induced). *Hepatogastroenterology* 2000;47:786-9.
- Cuzzocrea, S, Mazzon, E, Costantino, G, Serrano, I, Dugo, L, Calabro, G, Cucinotta, G, De Sarro, A, Caputi, AP. Beneficial effects of n-acetylcysteine on ischaemic brain injury. *Br J Pharmacol* 2000;130:1219-26.
- Dobrzynska, I, Skrzydlewska, E, Kasacka, I, Figaszewski, Z. Protective effect of N-acetylcysteine on rat liver cell membrane during methanol intoxication. *J Pharm Pharmacol* 2000;52:547-52.
- Grandjean, EM, Berthet, P, Ruffmann, R, Leuenberger, P. Efficacy of oral long-term N-acetylcysteine in chronic bronchopulmonary disease: a meta-analysis of published double-blind, placebo controlled clinical trials. *Clin Ther* 2000;22:209-21.
- Holdiness, MR. Clinical pharmacokinetics of N-acetylcysteine. *Clin Pharmacokinet* 1991;20:123-34.
- Martinez Banaloch, M. N-acetylcysteine elicited increase in complex I activity in synaptic mitochondria from aged mice: implications for treatment of Parkinson's disease. *Brain Res* 2000;859:173-5.
- Ortolani, O, Conti, A, De Gaudio, AR, Moraldi, E, Cantini, Q, Novelli, G. The effect of glutathione and N-acetylcysteine on lipoperoxidative damage in patients with early septic shock. *Am J Respir Crit Care Med* 2000;161:1907-11.
- Rubio, ML, Sanchez-Cifuentes, MV, Ortega, M, Peces-Barba, G, Escolar, JD, Verbanck, S, Paiva, M, Gonzalez Mangado, N. N-acetylcysteine prevents cigarette smoke induced small airways alterations in rats. *Eur Respir J* 2000;15:505-11.
- Woo, OF, Mueller, PD, Olson, KR, Anderson, IB, Kim, SY. Shorter duration of oral N-acetylcysteine therapy for acute acetaminophen overdose. *Ann Emerg Med* 2000;35:363-8.

Manufactured For: **The Medicine Store**  
15415 Pinehurst Dr.  
Basehor, KS 66007  
913-724-3666