

Sunny C-1000 FOR MAXIMUM BIOLOGICAL RESPONSE

Vitamin C is involved in many biochemical reactions and processes: collagen formation,^{1,2,3,4} wound healing,^{1,5} inflammatory response,⁶ free-radical protection⁷ and, perhaps most notable, immune response.^{8,9} A number of research studies describe the effect of vitamin C upon leukocytes,¹ such as natural killer (NK) cells,¹⁰ neutrophils,⁸ and lymphocytes.⁸ Vitamin C has also been described as necessary for normal macrophage activity.¹¹

Sunny C-1000: MORE THAN JUST ASCORBIC ACID

Sunny C-1000 is a unique combination of ascorbates and ascorbate metabolites and precursors. Each of the components included in **Sunny C-1000** is designed to participate in vitamin C metabolism and enhance uptake and retention. Recently, investigators compared the effects of **Sunny C-1000** to ascorbic acid in healthy, adult volunteers in a double-blind study (submitted for publication, A. Vojdani). Both **Sunny C-1000** and ascorbic acid were shown to enhance NK cell cytotoxicity; however, the investigators reported an advantage of **Sunny C-1000** over ascorbic acid, which included improved NK cell activity during the first four hours post-administration (Figure 1), a greater increase in plasma levels of ascorbic acid, and a greater increase in peripheral blood leukocyte uptake of ascorbic acid-18% to 25% above the levels reported with simple ascorbic acid (Figure 2).

Interestingly, the ascorbic acid group actually showed a 29% depression in NK cell cytotoxic activity during the first four hours after administration, while the **Sunny C-1000** group maintained baseline activity during this same time period. The significance of this finding is that there is potential for the suppression of NK cell activity to be prolonged if ascorbic acid is administered on a regular basis, e.g., every four hours.

VITAMIN C FOR OPTIMAL HEALTH

Many factors can affect vitamin C metabolism. Age, sickness, diet, drugs and lifestyle factors, such as smoking or exercise, can influence individual vitamin C requirements. The RDA of 60 mg per day is based on an amount that would protect against the outward symptoms of deficiency. Although further study is needed, a considerable amount of scientific literature supports the use of higher doses of vitamin C-doses that are difficult to attain from diet alone-for promoting optimal health.^{9,12,19,22,23}

Product Description:

Sunny C-1000 is a unique vitamin C formulation designed to produce maximum bioavailability. **Sunny C-1000** provides enhanced absorption and retention of vitamin C and unlike regular ascorbic acid, it is of near-neutral pH so it is gentle on the stomach, liver, teeth, and bowel.

Indications:

Nutritional needs related to vitamin C deficiency-induced effects upon the immune system.

Nutritional needs related to vitamin C deficiency-induced effects upon the cardiovascular system.

Nutritional needs related to collagen synthesis.

Nutritional needs related to lifestyle factors that may induce vitamin C deficiency: endurance exercise, emotional and environmental stress, alcoholism, certain medications, oral contraceptives, diet, and cigarette smoking.

Additional nutritional needs related to vitamin C and its role in:

- Dietary iron absorption; lipolysis, peptide and protein metabolism, epinephrine and norepinephrine formation, activation of folic acid, conversion of tryptophan to s-hydroxytryptophan and adrenal function.

BENEFITS:

- Improves NK cell activity
- Increased vitamin C uptake and retention in white blood cells
- Unique “Precursor Supporting System” designed to enhance vitamin C kinetics in tissues
- Well tolerated and gentle to the gastrointestinal tract

INGREDIENT DESCRIPTION:

Sunny C 1000 is a combination of nutritionally valuable ascorbates and ascorbate metabolites and precursors.

The Ascorbate Components consist of L-xyloascorbic acid, niacinamide ascorbate, ascorbyl palmitate, calcium ascorbate, magnesium ascorbate, potassium ascorbate and sodium ascorbate.

The Bioactive Metabolites and Precursors offer the following individual and unique contributions:

L-lysine may reduce urinary excretion of vitamin C and may slow the degradation rate of vitamin C. Lysine supplementation has been shown to increase total ascorbic acid levels in the serum, liver, kidneys, testes, spleen and brain tissues.¹³

Alpha d-ribofuranose and **xylitol** are ascorbate metabolites produced during the body’s utilization of vitamin C. By slowing vitamin C degradation through feedback inhibition, they may prolong vitamin C retention.^{15,16,17}

L-cysteine, an amino acid, may help slow vitamin C degradation by controlling levels of dehydroascorbate, an enzyme involved in ascorbic acid catabolism.^{18,19}

Tetrasodium pyrophosphate may enhance tissue transport of vitamin C. In addition, pyrophosphates are vital components in many energy-producing processes.²⁰

Glutathione provides further antioxidant protection.²¹

Directions:

One (1) 1,000 mg tablet up to two times daily or as directed by your healthcare practitioner.

This product is non-GMO and gluten free.

Caution: Keep out of the reach of children.

Storage: Keep tightly closed in a cool, dry place.

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.

REFERENCES

1. Mahan, L.K., Arlin, M.T. 1992. *Krouse’s Food, Nutrition and Diet Therapy*, 8th ed., 100-101, Philadelphia: W.B. Saunders. Co.
2. Chojkier M. et al., Specifically decreased collagen biosynthesis in scurvy dissociated from and effect on proline hydroxylation and correlated with body weight loss: *in vitro* studies in guinea pig calvarial bones. *J Clin Invest* 1984; 72:826-35.
3. Stassen F.L.H. et al., Activation of prolyl hydroxylase in L-929 fibroblasts by ascorbic acid. *Proc Natl Acad USA* 1973;70:1090-3.
4. Myllyla, R. et al., The role of ascorbate in the prolyl hydroxylase reaction. *Biochem Biophys Res Commun* 1978;83:441-8.
5. Mussini, E. et al., Collagen proline hydroxylase in wound healing, granuloma formation, scurvy, and growth. *Science* 1967;157:927-9.
6. Anderson, R. The immunostimulatory, anti-inflammatory and anti-allergic properties of ascorbate. *Adv Nutr Res* 1984;6:19-45.
7. Benrich, A. et al., The anti-oxidant role of vitamin C. *Adv Free Rad Biol Med* 1986;2:419-44.
8. Anderson, R., Ascorbic acid and immune functions. In Counsell J.N., Hornig D.H., eds. *Vitamin C: Ascorbic Acid*. London: Applied Science Publishers, 1981:249-72.
9. Peters, E.M. et al., Vitamin C supplementation reduces the incidence of post-race symptoms of upper respiratory-tract infection in ultramarathon runners. *Am J Clin Nutr* 1993;57:170-4.
10. Vojdani, A. Ghoneum, M., In vivo effect of ascorbic acid on enhancement of human natural killer cell activity. *Nutr Res*. 1993;13:753-64.
11. Ganguly, R. et al., Macrophage function in vitamin C-deficient guinea pigs. *Am J Clin Nutr* 1976;29:762-65.
12. Anderson, T.W. et al, Vitamin C and the Common Cold: a double-blind trial. *Can Med Ass J*. 1972; 105:503-508.
13. Chatterjee, A. et al., Effects of L-lysine administration of certain aspects of ascorbic acid metabolism. *Internat J Vit Nutr. Res.* 1976;46:286-90.
14. Martindale, *The Extra Pharmacopala*. 1982. J.E.F. Reynolds, ed. London: The Pharmaceutical Press.
15. Sowden, J.C. Occurrence, properties, and synthesis of the monosaccharides¹. In *The Carbohydrates Chemistry, Biochemistry, Physiology*. p. 84, 1957. W. Pigman, ed. New York: Academic Press.
16. Lang, K. *Biochemie der Ernährung*. 1979. Dr. D. Steinkopff Verlag. Darmstadt, p. 27.
17. Karrer, P. *Organic Chemistry*, 4th English ed. p. 313, 1950. Elsevier Publishing Co., Inc.
18. Banerjee, S.K. et al., Effect of sulphur containing amino acids and anabolic steroid on the metabolism of ascorbic acid in rats fed on necrogenic diets. *Ind J of Biochem Biophys.* 1973; 10: 27-30.
19. Lewin, S. *Vitamin C: its molecular biology and medical potential*. 1976. London; Academic Press.
20. Dixon, S. J. Wilson, J. X., Transforming growth factor-beta stimulates ascorbate transport activity in osteoblastic cells; *Endocrinology*, 130 (1) p. 484-9.
21. Johnston, C.S. et al., Vitamin C elevates red blood cell glutathione in health adults. *Am J Clin Nutr.* 1993;58:103-5.
22. Miller, J.Z. et al, Therapeutic effect of vitamin C. A co-twin control study. *JAMA* 1977; 237:248.
23. Cahill, R. J. et al, Effects of vitamin antioxidant supplementation on cell kinetics of patients with adenomatous polyps. *Gut.* 1993; 34:963-967.

Figure 1

The Effect of Ascorbic Acid or Sunny C-1000 on Natural Killer Cell Activity

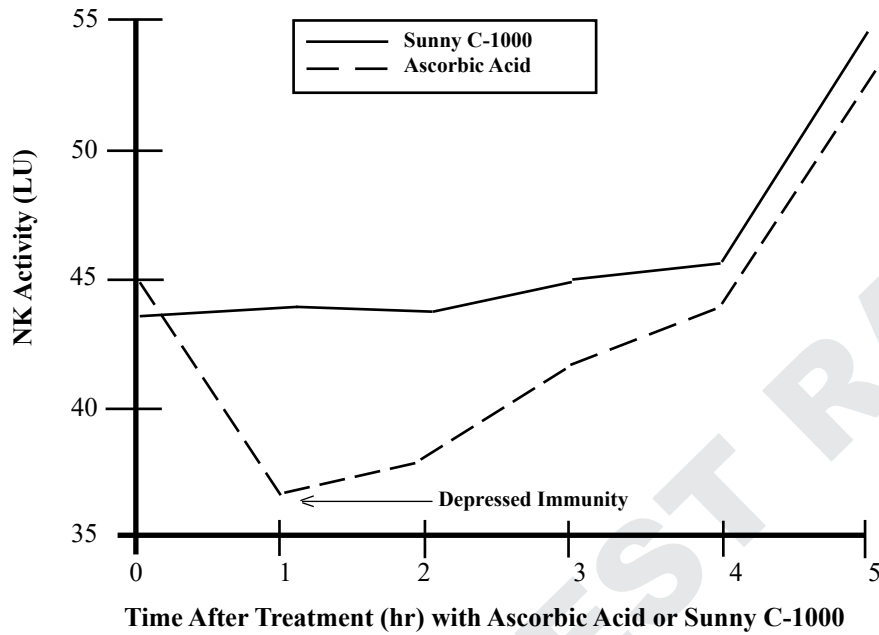
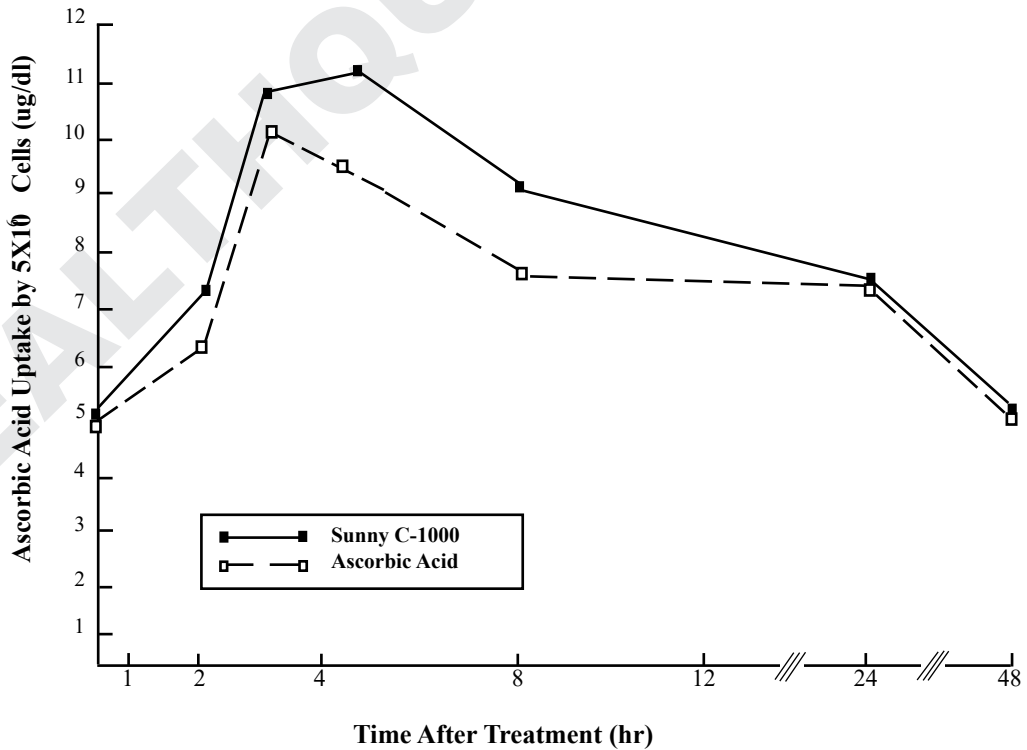


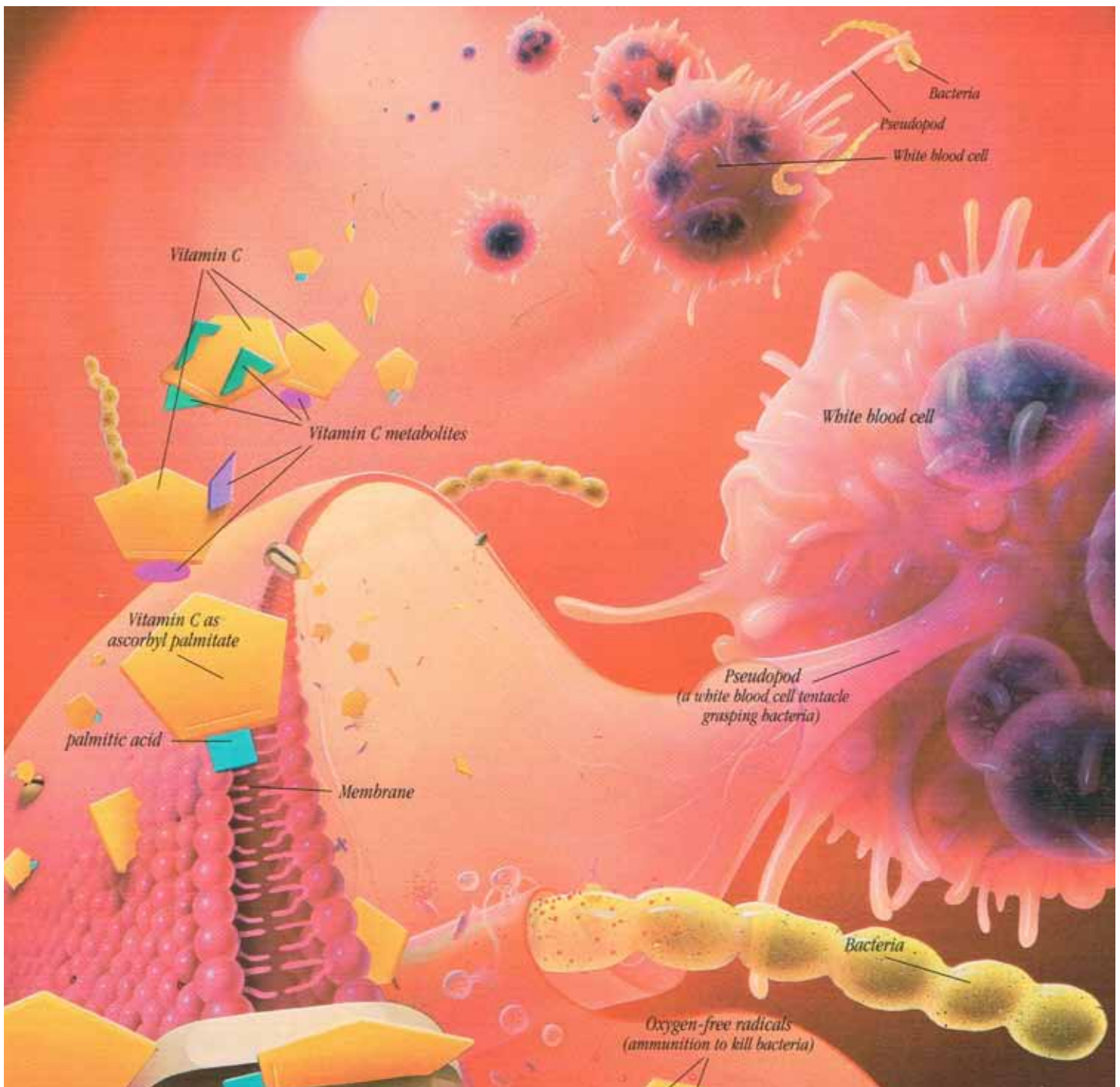
Figure 2



FOR ANSWERS TO QUESTIONS ABOUT THE USE OF *Sunny C 1000*, CALL:

Dr. David C. Kolbaba & Associates • 606 W. Main Street • West Dundee, IL 60118 • 847-428-8850

Dr. David C. Kolbaba & Associates • 1065 Dundee Avenue • East Dundee, IL 60118 • 847-428-8850
HealthQuest Radio • www.HealthQuestRadio.com • Hotline: 800-794-1855 10/18



Vitamin C: *Essential to Immune Function*

This illustration shows how the white blood cells of your immune system work and the best way to nourish them with vitamin C.

Imagine that you have been miniaturized to microscopic size and now find yourself in the blood stream looking down the length of a blood vessel. There is a continual stream of material flowing toward you including a long line of white blood cells that have been made more active by vitamin C. They move as if on patrol, searching the blood for any toxic substances or viral or bacterial foreign invaders. When in close proximity to one of these invaders, bacteria for example,

the white blood cell forms a tentacle-like projection (called a pseudopod) that extends out from the surface of the cell and wraps itself around the invading bacteria, drawing it into the cell to destroy it.

While grasping the bacteria, the white blood cell in the foreground has extended its tentacle-like projection so close to you that the microscopic structure of its membrane can be clearly seen. A cut-away view reveals two layers of the membrane, an inner and an outer layer, composed of millions of round fat molecules. Also visible is vitamin C, as well as supportive substances called

“vitamin C metabolites,” all simultaneously present to provide the cell with the most complete vitamin C nourishment possible. The ammunition needed to destroy the infection-causing bacteria is released inside the cell. It consists of powerful enzymes and substances called oxygen-free radicals that, when contacting the bacteria, destroy it. (Important note: vitamin C inside the cell helps protect it from being damaged by its own infection fighting ammunition).

You are now an eye witness to the fact that vitamin C is essential to immune function.