

HEALTH BENEFITS OF ALGAE

For centuries, algae has been considered a delicacy in Asia, and as its many health benefits have been realized, algae has also become an increasingly popular part of the Western diet. Algae has recently been spotlighted for its potentially positive effects on stem cells. Studies indicate that certain types of algae contain compounds that may facilitate increased release of bone marrow stem cells and increase the placement of stem cells into tissues in need.³

Stem cells are cells that have the remarkable ability to develop into various cell types in the body, such as red blood cells, muscle cells or brain cells.¹ Stem cell number and quality decreases with age, leaving the body more susceptible to health challenges. Because stem cells are thought to divide endlessly, they serve as a repair system for the body.¹ When stem cells divide, the new cells have the potential to either remain a stem cell or to become a cell with a more specialized function.² This is the primary role of adult stem cells, which are undifferentiated and found in several tissues in the body. Knowledge that adult stem cells in the body can create various healthy specialized tissues has prompted research about nutrients that may enhance this natural process.

Various forms of algae supplements are sold on the market today, including concentrated blue-green algae. However, no strong scientific evidence exists to suggest that concentrated forms of algae are more beneficial than whole algae.

Nature's Sunshine's Super Algae (Stock No. 1056-5) provides a combination of health-promoting algae, including *Aphanizomenon flos aquae*, chlorella and spirulina.

Algae have been associated with many health benefits. Algae provide a rich source of chlorophyll. Chlorophyll has antioxidant effects, protecting against free radical damage,⁴ and it has been shown to protect against many types of cancer.^{5,6} Studies indicate that certain species of blue-green algae may protect against inflammation, promote healthy cholesterol levels already within normal range, and support healthy immune function.⁷

Chlorella is a single-celled, freshwater green algae and a rich source of vitamins, minerals, protein, nucleic acids and lipids. Chlorella may promote healthy immune function by increasing the number of certain immune cells in the body.⁷ Chlorella contains a chemical component called Chlorella Growth Factor (CGF), a nucleotide-peptide complex that enables chlorella to grow quickly. Experiments have shown that CGF appears to enhance functions responsible for stimulating tissue repair.⁸ One animal study showed that after a single dose of CGF, the number of hematopoietic stem cells in the bone marrow and spleen increased, as did their survival after irradiation.⁹ Hematopoietic stem cells are blood-forming stem cells. Recent research has observed that hematopoietic stem cells appear to be able to form other kinds of cells as well, such as muscle, blood vessels, and bone.¹

Spirulina is a type of blue-green algae that combine single-celled organisms that have biochemical and cellular similarities to both plant and animal species.⁷ Spirulina is a rich source of protein, B vitamins and minerals. Spirulina is commonly recommended to promote healthy

energy levels and overall health and well-being. It contains a component called phycocyanin, which has been shown to positively affect bone marrow cell counts in animal models.^{10,11}

Aphanizomenon flos aquae (AFA) is another type of blue-green algae included in the Super Algae formula. AFA may boost immune function by stimulating the activity of important immune cells in the body.⁷ Preliminary studies suggest that AFA may enhance digestion and nutrient utilization.⁷ Recent studies suggest that AFA may increase the number of bone marrow stem cells circulating in the blood and promote the mobilization of CD34+ stem cells.¹²

Nature's Sunshine Super Algae (Stock No. 1056-5) is a broad-spectrum algae formula that provides an excellent source of nutrients that have been associated with increased health benefits.

References:

1. Stem Cell Information: The National Institutes of Health Resource for Stem Cell Research. 2006. Available at: <http://stemcells.nih.gov/info/basics/> Accessed December 19, 2007.
2. Bethesda, MD: National Institutes of Health, U.S. Department of Health and Human Services Stem cell basics. Updated Dec. 20, 2006. <<http://stemcells.nih.gov/info/basics/>>. Accessed December 19, 2007.
3. Christian Drapeau, MSc. Triple-Blind Randomized Placebo-Controlled Study of the Effect of StemEnhance™ on Bone Marrow Stem Cell Mobilization. 2006-2007. Available at: <http://www.enhancestemcellsnaturally.com/study.htm> Accessed December 19, 2007.
4. Kumar SS; Chaubey RC; Devasagayam TP; Priyadarsini KI; Chauhan PS. Inhibition of radiation-induced DNA damage in plasmid pBR322 by chlorophyllin and possible mechanism(s) of action. *Mutat Res*, 425(1):71-9 1999 Mar 10.
5. Harttig U; Bailey GS. Chemoprotection by natural chlorophylls in vivo: inhibition of dibenzo[a,l]pyrene-DNA adducts in rainbow trout liver. *Carcinogenesis*, 19(7):1323-6 1998 Jul.
6. Reddy AP; Harttig U; Barth MC; Baird WM; Schimerlik M; Hendricks JD; Bailey GS. Inhibition of dibenzo[a,l]pyrene-induced multi-organ carcinogenesis by dietary chlorophyllin in rainbow trout. *Carcinogenesis*, 20(10):1919-26 1999 Oct.
7. Jellin JM, Gregory PJ, Batz F, Hitchens K, et al. *Pharmacist's Letter/Prescriber's Letter Natural Medicines Comprehensive Database*. 9th ed. Stockton, CA: Therapeutic Research Faculty; 2007:pg 118, 187, 315.
8. Jensen, B. Ph.D. Chlorella, Jewel of the Far East. Escondido CA: Bernard Jensen Ph.D.;1992.
9. Rotkovska D; Vacek A; Bartonickova A. The radioprotective effects of aqueous extract from chlorococcal freshwater algae (*Chlorella kessleri*) in mice and rats. *Strahlenther Onkol* 1989 Nov;165(11):813-6.
10. Zhang C., et al. The Effects of Polysaccharide and Phycocyanin from *Spirulina platensis* variety on Peripheral blood and Hematopoietic system of Bone Marrow in Mice. Second Asia-Pacific Conference on

Alga Biotechnology, April 25-27, 1994. p.58. Also available at:
<http://www.spirulina.com/SPLAbstracts2.html#Marrow2> Accessed December 21, 2007.

11. Liu XM, Zhang HQ. Effect of polysaccharide from *Spirulina platensis* on hematopoietic cells proliferation, apoptosis and Bcl-2 expression in mice bearing tumor treated with chemotherapy. *Yao Xue Xue Bao*. 2002 Aug;37(8):616-20.
12. Jensen GS, Hart AN, Zaske LA, Drapeau C, Gupta N, Schaeffer DJ, Cruickshank JA. Mobilization of human CD34+ CD133+ and CD34+ CD133(-) stem cells in vivo by consumption of an extract from *Aphanizomenon flos-aquae*--related to modulation of CXCR4 expression by an L-selectin ligand? *Cardiovasc Revasc Med*. 2007 Jul-Sep;8(3):189-202.

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