

# MacularProtect Plus<sup>®</sup> Capsules

## Description

MacularProtect Plus is a high-potency antioxidant vitamin and mineral supplement designed to help maintain the health of the macula, the area at the center of the eye's retina where the sharpest central vision occurs. The nutrient profile of MacularProtect Plus reflects the findings of the Age-Related Eye Disease Study (AREDS) as well as other recent research that has increased scientific knowledge about the role of lutein in macular health. This formula is an appropriate choice for both non-smokers and smokers, who should avoid high intake of beta-carotene.

## MacularProtect Plus Highlights

- ▶ Powerful nutritional formulation for individuals concerned about preserving macular health
- ▶ Contains blend of antioxidants and zinc at levels found to support eye health in the AREDS clinical trial
- ▶ Contains 15 mg of FloraGLO<sup>®</sup> lutein and 1 mg of zeaxanthin, consistent with the latest scientific findings on lutein's role in macular health
- ▶ Delivers broad spectrum of natural source vitamin E, from alpha to gamma tocopherol
- ▶ Made from premium ingredients and manufactured according to the highest quality standards
- ▶ Effective stand-alone formulation for macular health

## Results from the Landmark AREDS Clinical Trial

AREDS, a long-term National Eye Institute-sponsored clinical trial, reported in 2001 that high-risk category patients supplementing with antioxidants and zinc improved the chance of retaining their macular health status by 25% and preserving their vision by 19%<sup>1</sup>.

## Rationale for Inclusion of Key Ingredients

### Vitamin A (5,000 IU)

MacularProtect Plus provides 100% of the recommended Daily Value of vitamin A; half as pre-formed retinyl palmitate and

half as beta-carotene, which is converted to vitamin A only as required by the body.

### Vitamin A as Retinyl Palmitate (50%; 2,500 IU)

Vitamin A (also known as pre-formed A or retinyl palmitate) is essential for proper eye health. It protects night vision and is vital for the health of the eye's cornea. It also works with zinc to support the proper function of various eye structures. Vitamin A serves an important role in interactions with zinc and the amino acid taurine within the photoreceptors of the retina.

### Vitamin A as Beta-Carotene (50%; 2,500 IU)

Beta-carotene functions primarily as an antioxidant and is converted to vitamin A only as needed by the body. MacularProtect Plus contains one-tenth the level of beta-carotene administered to AREDS participants. High doses of beta-carotene are linked to increased health risks in smokers; therefore, levels of supplemental beta-carotene similar to the amount utilized in AREDS may not be advisable for current or recent former smokers<sup>2,3</sup>. It is important to note that since AREDS began, new science has emerged suggesting lutein and zeaxanthin are the carotenoid antioxidants more positively associated with macular health.

### Vitamin C (1,000 mg)

Vitamin C is a water-soluble antioxidant that is concentrated in ocular tissues where it inactivates free radicals. Free radicals are the highly reactive compounds produced through the body's use of oxygen, and generated by outside sources such as UV light<sup>4</sup>. As an integral component of the body's antioxidant defenses, vitamin C also aids in the recycling of other antioxidants such as vitamin E. Evidence indicates

that the requirements for both vitamin C and E are higher in those who smoke<sup>5,6</sup>. MacularProtect Plus supplies the form and level of vitamin C administered in the AREDS clinical trial, plus an additional 500 mg.

### Vitamin E (400 IU)

Fat soluble vitamin E is the major chain-breaking antioxidant present in retinal and macular membranes. As a first line of defense against fatty acid peroxidation, vitamin E helps protect cell membranes against free radical attack. MacularProtect Plus provides the natural source rather than synthetic vitamin E, as studies demonstrate that this form offers superior bioavailability and is better retained in tissues<sup>7,8</sup>. It also delivers broad spectrum vitamin E from alpha to gamma tocopherol, that together play a health-protective role<sup>9,10</sup>. MacularProtect Plus includes 400 IU of vitamin E, the level used in AREDS.

### Zinc (80 mg)

Zinc is an essential mineral that is selectively concentrated in the eye. It is found in the retina and choroid, ciliary body, iris, optic nerve, sclera, cornea and lens. Within these ocular structures zinc is believed to interact with vitamin A and taurine to modify photoreceptor membranes, to help regulate the light-rhodopsin reaction, to influence nerve transmission and to serve as an antioxidant<sup>11</sup>. MacularProtect Plus provides 80 mg of zinc, the form and level administered in AREDS.

Lutein, FloraGLO<sup>®</sup> (15 mg) and Zeaxanthin (1 mg) Lutein and zeaxanthin are two similarly-structured carotenoids found in green leafy vegetables like spinach, kale and mustard





MacularProtect Plus is a powerful nutritional formulation to help preserve macular health. MacularProtect Plus is based upon the latest research supported by the National Eye Institute and other advanced science.

**Suggested Use:** Take a total of two capsules daily, with meals.

**Precautions:** Pregnant or lactating women or individuals with medical conditions should consult a physician before using.

**Note:** MacularProtect Plus contains 80 mg of zinc, a level that was found to support eye health in the AREDS clinical trial. It is important to check with your physician prior to taking MacularProtect Plus to ensure that this level of zinc is appropriate for you.

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.

## Supplement Facts

Serving Size 2 capsules Servings Per Container 30

	Amount Per Serving	% Daily Value
Vitamin A [50% (2,500 IU) from retinyl palmitate, and 50% (2,500 IU) from beta-carotene]	5,000 IU	100%
Vitamin C (from ascorbic acid)	1,000 mg	1,667%
Vitamin E (as d-alpha tocopheryl succinate and mixed tocopherols)	400 IU	1,333%
Zinc (from zinc oxide)	80 mg	533%
Selenium (from selenomethionine)	70 mcg	100%
Copper (from copper oxide)	2 mg	100%
Lutein (FloraGLO®)	15 mg	†
Zeaxanthin	1 mg	†

† Daily Value not established.

**Other Ingredients:** Gelatin, Water and Silica.



**SBH** ScienceBased Health®

1.888.433.4726  
www.sciencebasedhealth.com

## Lutein and Zeaxanthin (Continued)

greens. These carotenoids make up the macular pigment of the retina, the tissue with the highest concentration of lutein and zeaxanthin in the body<sup>12</sup>. As part of the macular pigment, lutein and zeaxanthin filter blue (visible) light that causes photo-oxidative stress. Population health studies have noted that macular pigment density is positively associated with age-related macular health<sup>13,14</sup>. Several intervention studies also indicate that consumption of these carotenoids from foods or supplements can favorably modify the density of macular pigment<sup>15-16</sup>.

The amount of lutein supplied by MacularProtect Plus is within the range of lutein intake (approximately 10-20 mg) found in studies to increase macular pigment density on average by about 18-19%, although the response appears to vary among individuals<sup>15-17</sup>. MacularProtect Plus provides FloraGLO® lutein, a premium source with proven bioavailability. The ratio of zeaxanthin to lutein within this formula reflects the levels naturally present in the diet<sup>18</sup>.

## Selenium (70 mcg)

Selenium is an essential mineral required for the proper function of glutathione peroxidase, an antioxidant enzyme found in the eye's lens and localized in photoreceptor and retinal pigment epithelial cells<sup>19</sup>. MacularProtect Plus delivers selenium as selenomethionine, a bioavailable source. Selenium is included in MacularProtect Plus at 100% of the recommended Daily Value.

## Copper (2 mg)

Copper is a mineral that is necessary for normal development of connective tissue, nerve sheaths, skin pigment and for the proper utilization of iron. Since high levels of zinc compete with copper for absorption, copper is included in MacularProtect Plus to help ensure an adequate level of this essential mineral in the body. MacularProtect Plus features 2 mg of copper oxide, the form and level administered in the AREDS clinical trial.

## References

- AREDS Report No. 8. A randomized, placebo-controlled clinical trial of high-dose supplementation with vitamins C and E, beta carotene, and zinc for age-related macular degeneration and vision loss. *Arch Ophthalmol* 119: 1417-1436, 2001.
- The Alpha-Tocopherol, Beta Carotene Cancer Prevention Study Group. The effect of vitamin E and beta carotene on the incidence of lung cancer and other cancers in male smokers. *N Engl J Med* 330: 1029-1035, 1994.
- Omenn GS, et al. Effects of a combination of beta-carotene and vitamin A on lung cancer and cardiovascular disease. *N Engl J Med* 334: 1150-1155, 1996.
- Bruno RS, et al. Alpha tocopherol disappearance is faster in cigarette smokers and is inversely related to their ascorbic acid status. *Am J Clin Nutr* 81: 95-103, 2005.
- Kelly G. (Review) The interaction of cigarette smoking and antioxidants Part III: Ascorbic acid. *Alt Med Rev* 8: 43-54, 2003.
- Moeller SM, et al. The potential role of dietary xanthophylls in cataract and age-related macular degeneration. *J Am Coll Nutr* 19: 522S-527S, 2000.
- Ferslew KE, Acuff RV, Daigneault EA, Woolley TW and Stanton PE. Pharmacokinetics and bioavailability of the RRR and all racemic stereoisomers of alpha-tocopherol in humans after single oral administration. *J Clin Pharmacol* 33: 84-88, 1993.
- Traber MG, Elsner A and Brigelius-Flohe R. Synthetic as compared with natural vitamin E is preferentially excreted as alpha-CEHC in human urine: studies using deuterated alpha-tocopheryl acetates. *FEBS Letters* 437: 145-148, 1998.
- Weinstein SJ. Serum alpha-tocopherol and gamma-tocopherol in relation to prostate cancer risk in a prospective study. *J Natl Cancer Inst.* 97: 396-399, 2005.
- Morris MC, et al. Relation of the tocopherol forms to incident Alzheimer disease and to cognitive change. *A J Clin Nutr* 81: 508-514, 2005.14. Stahl W. Review: Macular carotenoids: lutein and zeaxanthin. *Dev Ophthalmol* 38: 70-88, 2005.
- Grahn BH, et al. Review: Zinc and the eye. *J Am Coll Nutr* 20: 106-118, 2001.
- Landrum JT, et al. Lutein, zeaxanthin and the macular pigment. *Arch Biochem Biophys* 385: 28-40, 2001.
- Beatty S, et al. Macular pigment and risk for age-related macular degeneration in subjects from a Northern European population. *Invest Ophthalmol Vis Sci* 42: 439-446, 2001.
- Bone RA, et al. Macular pigment in donor eyes with and without AMD: a case-control study. *Invest Ophthalmol Vis Sci* 42: 235-240, 2001.
- Johnson EJ, et al. Relation among serum and tissue concentrations of lutein and zeaxanthin and macular pigment density. *Am J Clin Nutr* 71: 1555-1562, 2000.
- Berendschot TT, et al. Influence of lutein supplementation on macular pigment, assessed with two objective techniques. *Invest Ophthalmol Vis Sci* 41: 3322-3326, 2000.
- Hammond BR, et al. Dietary modification of human macular pigment density. *Invest Ophthalmol Vis Sci* 38: 1795-1801, 1997.
- Humphries JM, et al. Distribution of lutein, zeaxanthin, and related geometrical isomers in fruit, vegetables, wheat, and pasta products. *J Agric Food Chem* 51: 1322-1327, 2003.
- De la Paz MA, et al. Antioxidant enzymes of the human retina. *Curr Eye Res* 15: 273-278, 1996.

© ScienceBased Health. The ScienceBased Health name and logo are registered trademarks of ScienceBased Health. MacularProtect Plus® is a registered trademark of ScienceBased Health. FloraGLO® is a registered trademark of Kemlin Foods, L.C.