

Lyc-O-Vision™

A comprehensive approach to eye health

Protecting the eyes indoors, outdoors and year-round.

Today, most people are aware that excessive exposure to sunlight can result in skin damage. We protect our skin from the sun's harmful rays with protective clothing, sunscreen and dietary supplements, like Lyc-O-Derm, that offers a continual endogenous skin protection. But what about our eyes? These windows to the world are very sensitive to both ultra-violet light and to the longer wavelength high-energy visible radiation (HEV). HEV, also known as blue light, can penetrate deep into the retina causing oxidative damage. Sunlight, though, is not the only source of HEV. It is emitted by video display terminals (televisions, computer monitors, cell phone screens, etc.) and by the white fluorescent bulbs so common in the workplace.

UV and HEV radiation can cause retinal damage, like that found in age-related macular degeneration (AMD), and damage to the lens that results in cataracts. AMD affects greater than 10% of the population between the ages of 65 and 74 and greater than 25% of the population over the age of 75. The National Eye Institute reports that by age 80 over half of all Americans will have developed cataracts. These are numbers that should make us sit up and take notice.

Protecting our eyes from radiation that can cause oxidative damage is as important as protecting our skin. Sunglasses and brimmed hats provide a frontline defense on those sunny days out on the beach, but what of those winter

walks and hours at the computer or sitting in front of the TV? Lyc-O-Vision, an all natural dietary supplement, offers a comprehensive approach to eye health.

Benefits of Lyc-O-Vision

- Lutein/zeaxanthin helps protect the macula from oxidation due to exposure to blue light.
- Carnosic acid, a strong inducer of the body's main antioxidant defense system, penetrates the blood-brain barrier (8,9).
- Tomato lycopene inhibits formation of inflammatory mediators and may protect lutein/zeaxanthin from oxidation (3,10).
- Vitamin C and E, copper, and zinc can reduce the risk of AMD (1).

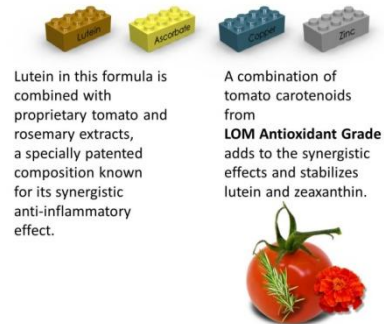
Lyc-O-Vision proprietary blend for the support of healthy eyes

Lyc-O-Vision consists of a patented complex of lutein and zeaxanthin together with tomato carotenoids, carnosic acid, and vitamin C, vitamin E, zinc and copper, the micronutrients recommended by the National Eye Institute following the announcement of the results of the Age-Related Eye Disease Study (AREDS) (1).

The lutein and zeaxanthin in Lyc-O-Vision are sourced from marigolds. The lycopene is a constituent of tomato extract, and the carnosic acid, a polyphenol, is extracted from rosemary. A capsule of Lyc-O-Vision each day — summer and winter, indoors and out — supports the precious health of our eyes.

Lyc-O-Vision: Multi-pathways eye health technology

The nutrient combination in **Lyc-O-Vision** Formula represents the second generation of the AREDS 2 study.



The effects of UV and HEV radiation on the eyes

When UV and HEV radiation penetrate the eye, a chain of reactions is set off. Oxidants, such as free-radicals and other reactive oxygen species are formed. These cause damage to the cells of the eye. In addition, most retinal diseases, including AMD, are mediated by inflammatory reactions. Oxidative stress is known to contribute to the inflammatory pathogenesis.

The science behind Lyc-O-Vision

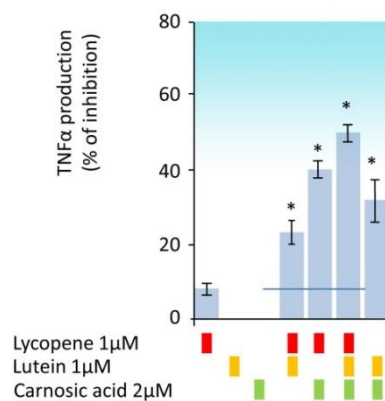
Lyc-O-Vision protects the eyes from an onslaught of oxidants with a potent combination of antioxidant carotenoids and polyphenols. Lyc-O-Vision also plays a role in inhibiting the formation of pro-inflammatory mediators and cytokines that are involved in the inflammatory process.

Lutein, zeaxanthin, tomato carotenoids including lycopene, phytoene, and phytofluene, and carnosic acid have all been shown to play a role in the inhibition of inflammation. The antioxidative effect of lutein and zeaxanthin is enhanced by the synergy that occurs when lycopene and carnosic acid are also present. The phytochemicals in natural tomato extract act to stabilize the lutein and zeaxanthin which accumulate selectively in the lens and macular region

of the retina. In AREDS2, an AREDS follow-up study, a 5-to-1 ratio of lutein to zeaxanthin was found to be beneficial in two of the subgroups tested: those taking a formulation that did not include beta-carotene, and those who had very little lutein and zeaxanthin in their diets (2).

The combination of lutein, lycopene and carnosic acid interfere with key molecular processes responsible for the production of pro-inflammatory mediators and cytokines in LPS-activated macrophages (LPS). This interference takes place through the inhibition of production of internal superoxide radicals. It was found that pre-incubation of mouse peritoneal macrophages with lutein, tomato lycopene and carnosic acid for 24 hours caused a synergistic inhibition of TNF α production after LPS stimulation (3).

Combination of lutein, lycopene and rosemary extract synergistically inhibits LPS-stimulated TNF α production by macrophages



Tomato extract is rich in lycopene, tocopherols, phytoene, phytofluene and other important bioactive phytochemicals. Low blood serum lycopene levels were found to be correlated with AMD in a population-based case-control study (4). There appears to be an inverse correlation between these constituents of the tomato and macular degeneration. Lycopene was found to be decreased in AMD patients while concentrations of lutein and zeaxanthin were not modified (5,6).

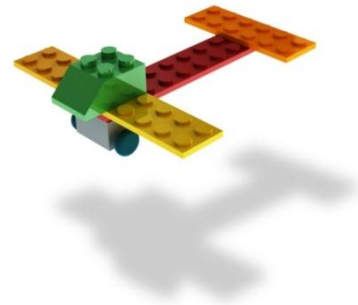
Carnosic acid is a unique pro-electrophilic compound that provides both a protective and an anti-inflammatory effect through induction of phase 2 antioxidant enzymes by the Nrf2/ARE transcription system (8,9). A recent study demonstrated the antioxidant and neuro-protective activity of carnosic acid in retinal cell lines and in a rat model of light-induced retinal degeneration (LIRD) (7). The findings suggested that carnosic acid can reach the eye and may have clinical application in diseases of the outer retina in which oxidative stress is thought to contribute to disease progression, including age-related macular degeneration.

The future of eye health lies in prevention

As the old adage says, “An ounce of prevention is worth a pound of cure.” The Lyc-O-Vision formulation provides that proverbial “ounce” by helping healthy eyes stay healthy. The synergy

present in the formulation allows for all the benefits to be delivered in a just one capsule a day. Lyc-O-Vision offers an easy way to afford the eyes the protection they need year round, indoors and out.

Lyc-O-Vision is a proprietary patented formulation of LycoRed Ltd.



References

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