

LE Magazine Super Sale 2006

## REPORT

### The Missing Link in Combating Macular Degeneration



If people live long enough, severe visual impairment is almost inevitable. The leading cause of blindness in people over age 50 is macular degeneration, a condition in which the central portion of the retina (the macula) deteriorates.

Over the past 15 years, researchers discovered that people who regularly ate spinach, collard greens, and certain other vegetables had lower rates of age-related macular degeneration. Compared to those with the lowest vegetable intake, people who consumed the most vegetables had a 43% reduction in their macular degeneration risk. Those who regularly ate spinach had an even greater reduction in macular degeneration incidence.<sup>1</sup>

When investigating what constituents of these vegetables protected the macula, lutein and zeaxanthin stood out as the most likely candidates. This was supported by research that involved testing the blood of people who contracted macular degeneration. Those with the highest plasma levels of lutein-zeaxanthin had the lowest rates of macular degeneration.<sup>2</sup>

Another reason scientists were so certain of their discovery is that in humans stricken with macular degeneration, the lutein-zeaxanthin content of their macula is severely depleted.<sup>3</sup>

If all people had to do was consume adequate zeaxanthin-lutein, then macular degeneration would theoretically disappear as an age-related disorder. Regrettably, macular degeneration still occurs in aging individuals, even in some of those who regularly eat spinach.

In what may be a breakthrough in the prevention of this blinding epidemic, scientists have discovered a compound naturally produced in the retina that is needed to maintain youthful macular density.<sup>4</sup>

This carotenoid compound is not found in the normal diet. It has been added, at no additional cost, to a popular eye health supplement used by most Life Extension members.

Considering how many people are afflicted by age-related macular degeneration, it remains a poorly understood disease to the lay public. Those who suffer its blinding effects can lose their central vision, which is needed for reading, driving, and every day activities.

The macula is the region of the retina responsible for the highest degree of visual activity. Underneath the macula lie photo-receptor cells that convert light images into nerve impulses that are transmitted to the brain.

Photo-receptor cells are protected against light damage by the macula. The macular pigment sits atop photo-receptor cells to absorb blue light while neutralizing free radicals.

Macular degeneration is characterized by a reduction in the density of the macular pigment that covers the photo-receptor cells. In primates, the density of the macular pigment can be increased by ingesting certain carotenoid-rich plants or taking supplements that contain zeaxanthin and lutein.<sup>3,5,6</sup>

The macular pigment is made up of the following three carotenoids:

- Lutein 50%
- Zeaxanthin 25%
- Meso-zeaxanthin 25%

Unlike lutein and zeaxanthin, meso-zeaxanthin is not found in the diet, but is converted in the retina from ingested lutein.<sup>7</sup> If

taken as a supplement, meso-zeaxanthin is absorbed into the blood stream and effectively increases macular pigment levels.<sup>8</sup>

Patients with macular degeneration have been shown to have 30% less meso-zeaxanthin in their macula compared to healthy eyes.<sup>9</sup> One reason for this deficiency of meso-zeaxanthin is lack of ingested lutein. Another explanation for the missing meso-zeaxanthin observed in macular degeneration may be the inability to adequately convert lutein to meso-zeaxanthin in the retina.

### MESO-ZEAXANTHIN DEFICIENCY CONFIRMED IN MACULAR DEGENERATION

An autopsy study on donated eyes was done to measure levels of lutein, zeaxanthin, and meso-zeaxanthin in the retina of those with and without macular degeneration.

As expected, levels of all three carotenoids (lutein, zeaxanthin, and meso-zeaxanthin) were reduced in those with macular degeneration compared to control subjects. The most significant finding, however, was the sharp decrease in meso-zeaxanthin in relation to zeaxanthin in the macula of macular degeneration subjects.<sup>3</sup>

This postmortem study helped confirm other studies indicating the importance of all three carotenoids (lutein, zeaxanthin, and meso-zeaxanthin) in maintaining the structural integrity of the macula.<sup>10,11</sup>

### VISION LOSS SEEN IN THOSE STRICKEN WITH MACULAR DEGENERATION



Normal vision



The same scene as viewed by a person with age-related macular degeneration

### PIONEERING MACULAR DEGENERATION RESEARCHERS

Drs. Richard Bone and John Landrum have been studying macular degeneration for over two decades. Together, they uncovered the role that various carotenoids play in maintaining the structure of the macula.

Their ongoing research has revealed the critical importance of lutein being converted to meso-zeaxanthin in the retina in order to maintain the density of the macular pigment. Some people with age-related macular degeneration have difficulty in synthesizing meso-zeaxanthin from lutein in the body, thereby creating a severe meso-zeaxanthin deficiency in their maculas.

Recent studies using a device that measures the thickness of the macula showed that in response to meso-zeaxanthin supplementation, macular pigment density increased!<sup>8</sup>

### SUMMARY

Age-related macular degeneration is the leading cause of vision loss in the United States. Approximately 20-25 million Americans are affected by some form of macular degeneration and this number is expected to triple by year 2025.

The macula is the portion of the retina used to see details such as fine lines or the shape of an object. It is needed for both near and far vision.

The macular pigment is composed exclusively of lutein, zeaxanthin, and meso-zeaxanthin.<sup>13</sup> These three carotenoids protect the macula and the photo-receptor cells beneath via their antioxidant properties and light-filtering capabilities.

Recent research indicates that meso-zeaxanthin may be more important than lutein in protecting against macular degeneration. Meso-zeaxanthin is synthesized in most people's bodies from lutein. It is not present in typical diets, even ones that include lots of vegetables.

Meso-zeaxanthin has been shown to increase macular pigment density.<sup>9,12</sup>

Supplementation with meso-zeaxanthin is the only practical source to obtain meso-zeaxanthin outside the body. It has not been available in supplemental form until now.

Scientists believe that people who have a high intake of lutein and zeaxanthin (from either diet or dietary supplements) plus take supplemental meso-zeaxanthin will have a very low incidence of macular degeneration.

### ADDITIONAL WAYS TO REDUCE MACULAR DEGENERATION RISK



Solar rays inflict tremendous damage to the eye, increasing the risk of cataract and macular degeneration. Humans of all ages should wear protective eye wear (ultra-violet light blocking sunglasses) when exposed to sunlight. During prolonged visual exposure to solar rays, brimmed hats or sun visors should be worn to further reduce UV-light exposure to the eye.

Cigarette smokers have startling high rates of macular degeneration. If the many health risks associated with smoking have not motivated you to quit, please consider the fact that female cigarette smokers are 2.4 times more likely to develop macular degeneration.<sup>12</sup> Regrettably, this cigarette-induced increase in macular degeneration risk may not decrease significantly for 15 or more years after smoking cessation.

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