Astaxanthin: A rising star on the carotenoid horizon

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Astaxanthin is a carotenoid produced by marine plants and microorganisms, particularly by the microalgae *Haematococcus pluvialis*. Natural accumulation of astaxanthin in the aquatic food chain lends red and pink coloration to higher organisms such as krill, shrimp and salmon. The molecular structure of astaxanthin is distinguished from other carotenoids by two additional hydroxyl groups, which afford a 10-fold greater antioxidant capacity compared to beta-carotene and lutein. More importantly, this structural nuance also enables modulation of receptors and genes involved in maintaining healthy inflammatory balance.*

**Metabolic and cardiovascular benefits***

Glucose metabolism and cardiovascular health are both contingent upon intact antioxidant defenses and inflammation balance. Benefits of astaxanthin on glucose and lipid homeostasis have been documented in a number of animal and human studies.* In a 12-week study of 61 human volunteers, astaxanthin provided statistically significant support for healthy lipid profiles.* Astaxanthin may also support endothelial relaxation through modulation of angiotensin II.* Favorable cardiometabolic outcomes have correlated with healthy levels of adiponectin, a hormone that maintains glucose uptake and lipid balance.* The salutary effects of adiponectin stem from healthy regulation of inflammatory markers such as TNFα and C-reactive protein (CRP) (Figure 1). In an eight-week, double-blind, placebo-controlled study, daily supplementation of 12 mg BioAstin®astaxanthin indicated support for CRP levels relative to placebo.*

- **Inflammatory balance***
- **Cardiometabolic health***
- **Ocular health***

*Figure 1. Astaxanthin targets reactive oxygen species (ROS), NFκB and adiponectin to maintain healthy inflammatory responses.*

**Immune support***
Several studies showing favorable effects on inflammatory responses have indicated concomitant support for immune defenses. Astaxanthin promotes immunoglobulins IgA, IgG and IgM production, an effect that is not observed with beta-carotene. In a randomized, double-blind, placebo-controlled study, subjects receiving astaxanthin over an 8-week period exhibited increases in lymphocyte proliferation and natural killer cell activity. From these investigations, it is clear that astaxanthin supports both cell-mediated and humoral immune responses.*

**Eye health**

Inflammatory balance is a critical consideration in achieving optimal visual function and overall eye health. Like other carotenoid pigments, astaxanthin accumulates in the retina, where it plays protective and functional roles. In addition to maintaining healthy cytokine activity in the eye, astaxanthin supports visual acuity and may help modulate eye fatigue. Significant support for visual acuity has been documented in healthy volunteers after only 1 month of astaxanthin supplementation.*

**Sources of astaxanthin**

Astaxanthin is naturally present in many marine organisms, including microalgae and the lipid fraction of krill. **BioAstin®astaxanthin** is a patented formulation from *Haematococcus pluvialis* microalgae that has been validated by multiple double-blind, placebo-controlled human clinical studies. **Krill-plex** is an extensively researched Antarctic krill oil, delivering omega-3 phospholipids and 1.5 mg of naturally occurring astaxanthin. **UltraKrill+D** is an odorless krill oil blend with 2.1 mg astaxanthin and 1,000 IU of vitamin D3 for enhanced support for inflammation balance.*

**References**


*These statements have not been evaluated by the Food & Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.