



Astaxanthin Targets the THE 10 FACTORS that Kills 1 Boomer Every 2 seconds

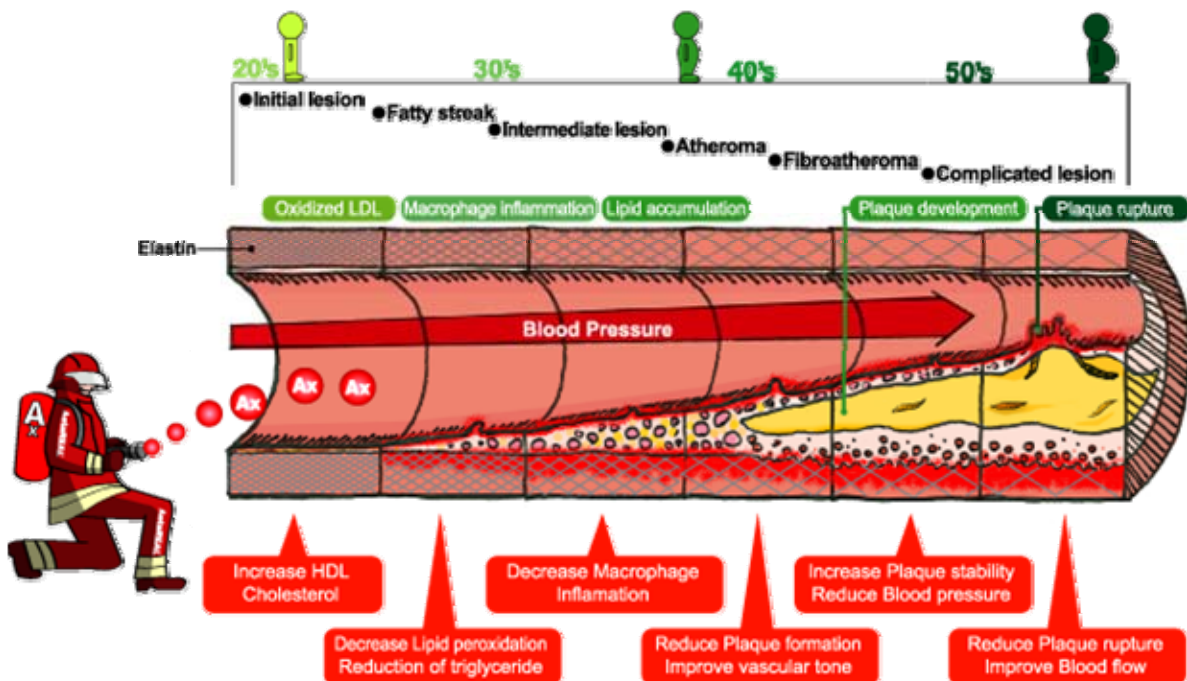
AstaREAL® Astaxanthin Reduced Incidences of Stroke up to 50%, Ruptured Plaques in the Arteries up to 49%, and Blood Pressure up to 17%, according to recent studies in USA-Japan

Greetings!

According to a study conducted by Tucson *et al*, (2001), 21% of teenagers evidenced a cardiovascular condition that silently narrow and thicken arteries (atherosclerosis). If unattended, this could be responsible for a large majority of cardiovascular deaths at a rate of 1 person every 2 seconds, more likely a baby boomer.

With this in mind, this month's newsletter focuses on the 10 beneficial and integrating effects of AstaREAL® astaxanthin against the degeneration of atherosclerosis at different stages of development (see the picture below). The key factors that differentiate astaxanthin from other antioxidants is the ability to increase HDL cholesterol and vascular tone in addition to reducing oxidative stress, LDL cholesterol, triglycerides, inflammatory responses, blood pressure, plaque formation or rupture.

The Effects of Astaxanthin on Atherosclerosis Prevention and Development



► AstaREAL® Astaxanthin (50mg/day and 5mg/day) intake for 2 weeks diminished incidences of stroke by 50% and 25% in hypertensive rats (Hussein *et.al*, 2005)

► AstaREAL® Astaxanthin (5mg-25mg/day) reduced diastolic blood pressure (up to 17%) and systolic blood pressure (up to 12%) in hypertensive rats in time ranging from 2-to-4 weeks (Hussein *et.al*, 2005-2006; Preuss *et.al*, 2009).

► AstaREAL® (100mg/day x 24weeks) decreased ruptured plaques in the arteries by 49% and improved plaque stability by 46% compared to control group in rabbits (Li *et.al*, 2004).

Every 2 seconds, 1 Person -*more likely a Baby Boomer*- dies of Cardiovascular Disease (CVD) adding to a dreadful 16,700,000 souls per year- *roughly equal to the population of New York City*. Indeed, CVD accounts for 29% of all deaths globally; the primary cause of death in EU (42%), Eastern Europe (48%), UK (39%), North America (49%), China (34%), South America (31%); Middle-East (36%) and India (29%) - *World Health Report, 2006*.

According to a study conducted by Tucson *et al*, (2001), 21% of teenagers evidenced atherosclerosis formations, a cardiovascular condition that silently narrow and thicken arteries and becomes responsible for the large majority of cardiovascular deaths in baby boomers. If the status quo remains, by 2030, almost 23.6 million people will die from CVDs every year, mainly from heart disease and stroke (1 person would die every 1 second!!)

According to recent human and animal studies, **AstaREAL® Astaxanthin** may reduce the risks of atherosclerosis at all stages of development by acting on **THE 10 FACTORS**:

(1) increase HDL Cholesterol; (2) reduce lipid peroxidation; (3) reduction of triglycerides; (4) reduce macrophage inflammatory responses; (5) reduce plaque formation; (6) improve vascular tone (elastin) (7) increase plaque stability; (8) reduce blood pressure; (9) reduce plaque rupture and (10) improve blood flow.

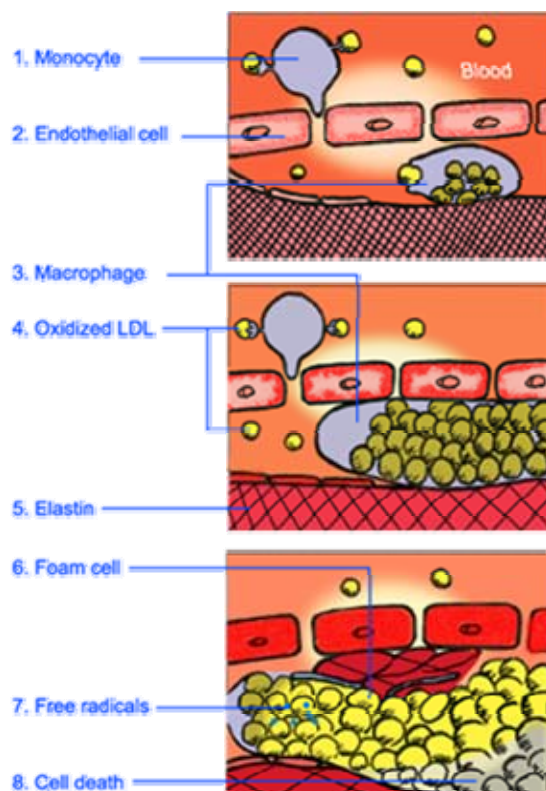
Article Headline

Atherosclerosis starts when high blood pressure, high cholesterol or smoking cause a "wound" in the inner lining of artery walls (endothelium) leading to accumulation of fatty streaks. At this point, macrophages white blood cells infiltrate in the lesion to gobble up pathogens and clear away dead cells. However, macrophages may get overloaded with excessive lipoproteins and get trapped in the artery wall. This further accentuates the bulge in the artery walls, triggering further inflammatory responses and potent oxidant activities. Over time, the formation of calcified plaques in the arteries increment possibilities of ruptures and clots. This amplify dramatically the likelihood of suffering from heart attacks, strokes or peripheral artery diseases, which affect kidneys, stomach, arms, legs and feet (may require amputations).

Astaxanthin quenches Reactive Oxygen Species (ROS) and suppress inflammatory responses considered to be the leading factors of atherosclerosis formation; development and complication.

Below a series of animal and human studies that recapitulate some of the preventive effects of AstaREAL Astaxanthin on THE 10 FACTORS that lead to any atherosclerotic complications

Development of Atherosclerosis



Factor 1-3

Early Stage-Increase HDL Cholesterol, Reduce Triglyceride, Reduce Lipid Peroxidation

- AstaREAL® astaxanthin (12mg/day x 12 weeks) decreased blood serum triglyceride by 25% and increased HDL cholesterol by 15% in a randomized double-blind study, placebo controlled study with 61 with moderately hypertriglyceridemic volunteers (Yoshida, *et.al*, 2009)
- AstaREAL® astaxanthin (18mg/day x 12 weeks) decreased blood serum triglyceride by 24% and increased HDL cholesterol by 7% in a randomized double-blind study, placebo controlled study with 61 moderately hypertriglyceridemic volunteers (Yoshida, *et.al*, 2009)
- AstaREAL® astaxanthin (6mg/day x 12 weeks) increased HDL cholesterol by 10.6% % in a randomized double-blind study, placebo controlled study with 61 moderately hypertriglyceridemic volunteers (Yoshida, *et.al*, 2009)
- AstaREAL® astaxanthin (8 mg/day x 3 months) reduced lipid peroxidation (plasma 12-and-15-hydroxy fatty acid) by 36% and 60% in 20 healthy non-smoking males (Karppi *et.al*, 2007).)
- AstaREAL® astaxanthin (5mg/day x 7 weeks) reduced oxidative status-vascular physiology by 84% in spontaneously hypertensive rats (Hussein *et.al*, 2006)

Factor 4

Reduction of Macrophage Inflammatory Response

- AstaREAL® astaxanthin (100mg/day x 24 weeks) decreased macrophage-occupied lesion areas in thoracic aorta in rabbits by 50% and cell death by 40% (Li *et.al*, 2004).
- AstaREAL® astaxanthin (5-10uM) decrease macrophages related activation (SR-A and CD36) by 48% and 58% respectively after 24 hours (Kishimoto *et.al*, 2009)

Factor 5

Enhance Vascular Tone

- AstaREAL® astaxanthin (5mg/day x 7 weeks) decreased vascular wall thickness by 47% improved vascular tone (elastin) by 36% in spontaneously hypertensive rats (Hussein *et.al*, 2006).
- AstaREAL® astaxanthin (6mg/day x 8 weeks) increased ABI (ankle brachial pressure index) by 4% suggesting reduce lower limb vascular resistance (Iwabayashi *et.al*,2009)
- AstaREAL® astaxanthin (6mg/day x 10 days) enhanced capillary blood flow by 10% in 7 healthy individuals compared to control group (Miyawaki *et.al*, 2008)

Factor 6

Reduction of Blood Pressure

- AstaREAL® astaxanthin (5mg/day x 7 weeks) reduced Diastolic Blood Pressure (DBP) by 17% and Systolic Blood Pressure (SBP) by 12% in spontaneously hypertensive rats whereas (Hussein *et.al*, 2006).
- AstaREAL® astaxanthin (5mg/day x 5 weeks) reduction in Systolic Blood Pressure (-6%), Diastolic Blood Pressure (-10%) in spontaneous hypertensive rats (Hussein *et.al*, 2005).
- AstaREAL® astaxanthin (6mg/day x 4 weeks) reduced systolic blood pressure and diastolic blood pressure by 7% in 20 healthy postmenopausal volunteers (Iwabayashi *et.al*,2009).
- AstaREAL® astaxanthin (25mg/day x 57 days) reduction of Systolic blood pressure by 7% in

rats compared to control group (Preuss, *et.al*, 2009).

- AstaREAL® astaxanthin (25mg/day x 12 days) reduced Systolic Blood pressure by 9% after heat stress in rats compared to control group (Preuss, *et.al*, 2009)

Factor 7-10

Increase Plaque Stability and Reduce Plaque Formation-Rupture

- AstaREAL® (100mg/day x 24weeks) decreased ruptured plaques in the arteries by 49% and improved plaque stability by 46% compared to control group in rabbits (Li *et. al*, 2004).
- AstaREAL® Astaxanthin (50mg/day and 5mg/day) intake for 2 weeks diminished incidences of stroke by 50% and 25% in hypertensive rats (Hussein *et.al* 2005)

Reference:

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