

## Update Exclusive

January 18, 2008

**Lipoic acid supplementation may reduce atherosclerosis and weight gain**

On December 24, 2007, the American Heart Association journal *Circulation* published the discovery of researchers at the Linus Pauling Institute and College of Veterinary Medicine at Oregon State University, and the Department of Medicine at the University of Washington that supplementing mice with lipoic acid reduced arterial lesion formation, triglycerides, blood vessel inflammation and weight gain, all of which are factors involved in the development of cardiovascular disease. Lipoic acid is a nutrient that occurs in small amounts in green leafy vegetables, potatoes and meats, and is also available as an over the counter supplement.

For the current study, the research team used apolipoprotein E-deficient and apolipoprotein E/low-density lipoprotein receptor-deficient mice, which are established models of human heart disease. The mice were divided to receive diets containing a normal amount of fat or extra fat, with or without supplemental lipoic acid for ten weeks. The amount of lipoic acid used was the human equivalent of 2,000 milligrams, a level that is impossible to achieve by consuming an average diet.

At the study's conclusion, lipoic acid supplementation was associated with a significant reduction of atherosclerotic lesion formation in both mouse models. Supplemented mice had 40 percent less weight gain and lower triglycerides in both serum and very low-density lipoprotein compared to those that did not receive the compound. These animals also experienced less inflammation as shown by lower aortic expression of adhesion molecules and proinflammatory cytokines and aortic macrophage accumulation, particularly in the areas in which atherosclerotic lesion formation was reduced.

"We are excited about these results, particularly since the supplements of lipoic acid appear to provide several different mechanisms to improve cardiovascular health," stated study coauthor Balz Frei, PhD, who is the director of the Linus Pauling Institute. "They are helping in a fundamental way to reset and normalize metabolic processes, in ways that could help address one of the most significant health problems in the Western world."

"From what we understand, this supplement would be most valuable as a preventive mechanism before people have advanced cardiovascular disease," Dr Frei observed. "However, it may help retard the process at any stage, and may also be of value in treating diabetic complications."

"These findings also reinforce the need for more comprehensive human studies," he added. "That will be the next step in our research, in double-blind, randomized, clinical studies during the next five years with Oregon Health and Science University."

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**Health Concern****Chronic inflammation**

Aging results in an increase of inflammatory cytokines (destructive cell-signaling chemicals) that contribute to the progression of many degenerative diseases (Van der Meide et al. 1996; Licinio et al. 1999). Rheumatoid arthritis is a classic autoimmune disorder in which excess levels of cytokines such as tumor necrosis factor-alpha (TNF- $\alpha$ ), interleukin-6 (IL-6), interleukin 1b [IL-1(b)], and/or interleukin-8 (IL-8) are known to cause or contribute to the inflammatory syndrome (Deon et al. 2001).

Chronic inflammation is also involved in diseases as diverse as atherosclerosis, cancer, heart valve dysfunction, obesity, diabetes, congestive heart failure, digestive system diseases, and Alzheimer's disease (Brouqui et al. 1994; Devaux et al. 1997; De Keyser et al. 1998).

Scientists have identified dietary supplements and prescription

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drugs that can reduce levels of the pro-inflammatory cytokines. The docosahexaenoic acid (DHA) fraction of fish oil is the best documented supplement to suppress TNF-a, IL-6, IL-1(b), and IL-8 (Jeyarajah et al. 1999; James et al. 2000; Watanabe et al. 2000; Yano et al. 2000). A study on healthy humans and those with rheumatoid disease shows that fish oil suppresses these dangerous cytokines by up to 90% (James et al. 2000).

Other cytokine-lowering supplements are DHEA (Casson et al. 1993), vitamin K (Reddi et al. 1995; Weber 1997), GLA (gamma linolenic acid) (Purasiri et al. 1994), and nettle leaf extract (Teucher et al. 1996). Antioxidants, such as vitamin E (Devaraj et al. 2000) and N-acetyl-cysteine (Gosset et al. 1999), may also lower pro-inflammatory cytokines and protect against their toxic effects.

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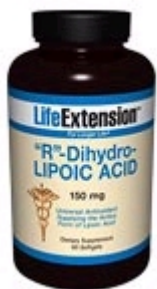
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When alpha lipoic acid is ingested, it is first converted to its reduced form, R-dihydro-lipoic acid, where the main action of lipoic acid is initiated. R-dihydro-lipoic acid is the reduced (or active) form of R-lipoic acid. R-dihydro-lipoic acid produces the majority of the results attributed to R-lipoic acid and alpha lipoic acid. By consuming R-dihydro-lipoic acid, you are obtaining the form of R-lipoic acid that is immediately available to cells. R-dihydro-lipoic acid is only available in liquid capsules because it is itself a liquid and must be kept sealed from air.

### DHA 240



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## News Archive

### Life Extension Update

- Alpha-lipoic acid improves diabetic neuropathy symptoms
- Alpha-lipoic acid completely prevents atherosclerosis in diabetic mice

### What's Hot

- Alpha-lipoic acid helps reduce symptoms of diabetic neuropathy
- Antioxidants may help prevent tick-borne illnesses

## Life Extension magazine

- Lipoic Acid: a multitude of metabolic health benefits
- Alpha Lipoic Acid: the "universal" antioxidant that generates energy and is an effective treatment for diabetes

If you have questions or comments concerning this issue or past issues of *Life Extension Update*, send them to [ddye@lifeextension.com](mailto:ddye@lifeextension.com) or call 954 202 7716.

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