

UPDATE

Alpha Lipoic Acid

THE "UNIVERSAL" ANTIOXIDANT THAT GENERATES ENERGY AND IS AN EFFECTIVE TREATMENT FOR DIABETES

Until recently, the antioxidants that fight damaging free radicals within the body were thought to be largely specialized in function. For example, the major function of the enzyme superoxide dismutase (SOD) is to inhibit superoxide radicals; beta carotene's primary role is to quench singlet oxygen radicals; vitamin E's main role is to break lipid peroxide chains in cell membranes; the primary function of glutathione is to knock out damaging hydroxyl radicals, and coenzyme Q10 (CoQ) fights off oxyradicals produced in the mitochondria (the power plants of the cells), which occurs in part as a result of CoQ's role in the generation of energy.

UNIVERSAL ANTIOXIDANTS

In recent years, however, Dr. Russell J. Reiter of the University of Texas at Austin and other scientists have produced evidence that the pineal hormone melatonin is a highly potent "universal" antioxidant found in virtually every cell of the body, and that it counteracts excessive free radical activity via several mechanisms in cell membranes as well as in the interior of cells. Melatonin plays an especially important role in fighting free radicals in the brain, where far more oxyradicals are generated than in any other part of the body because of the enormous amount of oxygen needed for brain metabolism.



The discovery of the "universal" antioxidant power of melatonin is evidence of the existence of all purpose antioxidants that have across the board action against a wide spectrum of free radicals, and which, presumably, can substitute for the more specialized antioxidants when this becomes necessary.



THE "UNIVERSAL" ACTION OF ALPHA LIPOIC ACID

There is now evidence of another "universal" antioxidant called alpha lipoic acid, which not only has potent antioxidant action in virtually all the tissues of the body, but also is a co-factor for some of the key enzymes (alpha keto acid dehydrogenases) involved to generating energy from food and oxygen in mitochondria.

Alpha Lipoic Acid is known by a variety of names including thioctic acid, 1,2-dithiolane-3-pentanoic acid, 1,2-dithiolane-3 valeric acid, and 6,8-thioctic acid. Alpha lipoic acid functions as a co-factor for energy production as lipomide and is also called lipoate when functioning in this manner.

When alpha lipoic acid was first isolated in the early 1950s, it was tentatively classified as a vitamin because of its vitamin like properties, but was later found (unlike vitamins) to be synthesized in both animals and humans. The method by which alpha lipoic acid is synthesized within the body has not yet been fully characterized but it appears as if two of its precursors are octanoate and the sulphur amino acid cysteine.

Recent findings show that both alpha lipoic acid and its reduced form dihydrolipoic acid (DHLA) (Fig. 1) function as potent within the body and that both these compounds may be effective in preventing and treating the complications of diabetes and, perhaps, aging itself. Before we delve into the potential therapeutic benefits of alpha lipoic acid and DHLA, let's take a look at the findings showing their antioxidant properties.

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