



Review

Lipoic acid – biological activity and therapeutic potential

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Abstract:

α -Lipoic acid (LA; 5-(1,2-dithiolan-3-yl)pentanoic acid) was originally isolated from bovine liver by Reed et al. in 1951. LA was once considered a vitamin. Subsequently, it was found that LA is not a vitamin and is synthesized by plants and animals. LA is covalently bound to the ϵ -amino group of lysine residues and functions as a cofactor for mitochondrial enzymes by catalyzing the oxidative decarboxylation of pyruvate, α -ketoglutarate and branched-chain α -keto acids. LA and its reduced form – dihydrolipoic acid (DHLA), meet all the criteria for an ideal antioxidant because they can easily quench radicals, can chelate metals, have an amphiphilic character and they do not exhibit any serious side effects. They interact with other antioxidants and can regenerate them. For this reason, LA is called an antioxidant of antioxidants. LA has an influence on the second messenger nuclear factor κ B (NF- κ B) and attenuates the release of free radicals and cytotoxic cytokines. The therapeutic action of LA is based on its antioxidant properties. Current studies support its use in the ancillary treatment of many diseases, such as diabetes, cardiovascular, neurodegenerative, autoimmune diseases, cancer and AIDS. This review was undertaken to gather the most recent information regarding the therapeutic properties of LA and its possible utility in disease treatment.

Key words:

lipoic acid, antioxidant activity, therapeutic application
