

## Síndrome metabólica e ácido alfa lipóico

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### Utilization of the insulin-signaling network in the metabolic actions of alpha-lipoic acid-reduction or oxidation ?

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Alpha-lipoic acid is a naturally occurring cofactor of mitochondrial dehydrogenase complexes and a potent antioxidant. It can interchange between a reduced form and an oxidized form, thereby displaying reducing (antioxidant) and prooxidant properties, respectively. It is suggested that alpha-lipoic acid through its prooxidant properties acutely stimulates the insulin-signaling cascade, thereby increasing glucose uptake in muscle and fat cells. On the other hand, alpha-lipoic acid appears to protect the insulin-signaling cascade from oxidative stress-induced insulin resistance through its reducing capacities. In addition, alpha-lipoic acid seems to inhibit hepatic gluconeogenesis by interfering with fatty acid oxidation, as well as to increase peripheral glucose utilization by activating pyruvate dehydrogenase resulting in increased glucose oxidation. **These different properties render alpha-lipoic acid a potentially attractive therapeutic agent for the treatment of insulin resistance.** Moreover, given the potential role of oxidative stress in the pathogenesis of secondary complications in diabetes, alpha-lipoic acid might be beneficial in the prevention/treatment of these complications as was recently shown for diabetic neuropathy.

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