

**Justification for antioxidant preconditioning (or how to protect insulin-mediated actions under oxidative stress).**

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Insulin resistance is characterized by impaired glucose utilization in the peripheral tissues, accelerated muscle protein degradation, impaired antioxidant defences and extensive cell death. Apparently, both insulin and IGF-1 at physiological concentrations support cell survival by phosphatidylinositol 3 kinase-dependent and independent mechanisms. Postprandial hyperglycemia and hyperinsulinemia are found in insulin resistance, which accompanies the so-called noninsulin dependent diabetes mellitus (diabetes type 2). Evidence also indicates that increased susceptibility of muscle cells and cardiomyocytes to oxidative stress is among the harmful complications of insulin resistance and diabetes. Limited knowledge showing benefits of preconditioning with anti-oxidants (vitamin C, E,  $\alpha$ -lipoic acid, N-acetylcysteine) in order to protect insulin action under oxidative stress prompted the author to discuss the theoretical background to this approach. It should be stressed that antioxidant preconditioning is relevant to prevention of both diabetes- and insulin resistance-associated side-effects such as low viability and cell deletion. Furthermore, antioxidant conditioning promises to provide higher efficacy for clinical applications in myoblast transfer therapy and cardiomyoplasty.

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