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Dynamic Cardiac Mitochondrial Proteome Alterations after Ischemic Preconditioning

Authors : Abdelbary Prince, Said Moussa, Hyungkyu Kim, Eman Gouda, Jin Han

Abstract : We compared the dynamic alterations of mitochondrial proteome of control, ischemia-reperfusion (IR) and ischemic preconditioned (IPC) rabbit hearts. Using 2-DE, we identified 29 mitochondrial proteins that were differentially expressed in the IR heart compared with the control and IPC hearts. For two of the spots, the expression patterns were confirmed by Western blotting analysis. These proteins included succinate dehydrogenase complex, Acyl-CoA dehydrogenase, carnitine acetyltransferase, dihydrolipoamide dehydrogenase, Atpase, ATP synthase, dihydrolipoamide succinyltransferase, ubiquinol-cytochrome c reductase, translation elongation factor, acyl-CoA dehydrogenase, actin alpha, succinyl-CoA Ligase, dihydrolipoamide S-succinyltransferase, citrate synthase, acetyl-Coenzyme A dehydrogenase, creatine kinase, isocitrate dehydrogenase, pyruvate dehydrogenase, prohibitin, NADH dehydrogenase (ubiquinone) Fe-S protein, enoyl Coenzyme A hydratase, superoxide dismutase [Mn], and 24-kDa subunit of complex I. Interestingly, most of these proteins are associated with the mitochondrial respiratory chain, antioxidant enzyme system, and energy metabolism. The results provide clues as to the cardioprotective mechanism of ischemic preconditioning at the protein level and may serve as potential biomarkers for detection of ischemia-induced cardiac injury.

Keywords : ischemic preconditioning, mitochondria, proteome, cardioprotection
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