

Catalytic Efficiency of Succinate Dehydrogenase is Modulated by Mitochondrial Hexokinase Activity in Potato Tuber (*Solanum tuberosum*).

Messeder, D.J.A. , Camacho-Pereira, J. , Galina, A.

Instituto de Bioquímica Médica, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil.

The mitochondrial succinate dehydrogenase (SDH) complex catalyses the oxidation of succinate to fumarate in the Krebs cycle, and feeds electrons to the ubiquinone (UQ) pool in the respiratory chain. In potato tuber mitochondria, hexokinase (mt-HK), a glycolytic enzyme which phosphorylates hexoses, seems to participate in oxidative phosphorylation modulating ROS formation by a mechanism that involves mitochondrial ADP recycling mechanism, acting as a preventive antioxidant defense (Camacho-Pereira et al. Plant Physiol. 2009; 149 1099-1110). The abolished in ROS accumulation by mt-HK is accompanied by a small decrease in membrane potential and acceleration in oxygen consumption. The preventive antioxidant effect occurs when the respiratory chain is feed by succinate. Here we investigated the activity of the SDH in presence of mt-HK substrates. The SDH activity measured in presence of 1 mM ATP and 5 mM glucose showed a reduction in 70 % in the catalytic efficiency (V_{max}/K_M) related to the control. The catalytic efficiency of SDH measured in presence of 1 mM ATP was 50 %. Glucose *per se* did not alter the kinetic proprieties of SDH. We conclude that kinetic proprieties of SDH could be modulated by mt-HK activity.

Key words: succinate dehydrogenase, hexokinase, potato tuber mitochondria.

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