

P68

Enzymatic and Energetic Properties of the Aerobic Respiratory NADH Oxidase System in *Vibrio* sp. KYJ 962

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Abstract

The activity of membrane-bound NADH oxidase of *Vibrio* sp. KYJ 962 was specifically stimulated by Na^+ . The maximum activity of NADH (or deamino-NADH) oxidase was obtained at about pH 9.0 in the presence of 0.2 M NaCl. Surprisingly, the maximum activity of NADH:ubiquinone-1 oxidoreductase was obtained at about pH 7.5 in the presence of 0.1 M NaCl. Respiratory inhibitor 2-heptyl-4-hydroxyquinoline-N-oxide (HQNO) inhibited the NADH oxidase activity by about 96% and the NADH:ubiquinone-1 oxidoreductase activity by about 54% at a concentration of 60 μM , respectively. Capsaicin inhibited the activities of NADH oxidase and NADH:ubiquinone-1 oxidoreductase by about 35% inhibited at a concentration of 300 μM , while rotenone inhibited little the activities. On the other hand, electron transfer from NADH or deamino-NADH to ubiquinone-1 generated a membrane potential ($\Delta\Psi$). The $\Delta\Psi$ was resistant to a proton conductor carbonylcyanide *m*-chlorophenylhydrazone (CCCP), but was collapsed by completely by the mixture of 10 μM CCCP and 20 μM monensin. The $\Delta\Psi$, also, was resistant to rotenone and capsaicin.

Keywords: *Vibrio* sp. KYJ 962, NADH (or deamino-NADH) oxidase system, NADH (or deamino-NADH):ubiquinone-1 oxidoreductase