P71

Enzymatic and Energetic Properties of NADH:Ubiqinone Oxidoreductase in the Marine Bacterium *Pseudomonas nautica*

Young Jae Kim

Department of Microbiology, College of Natural Sciences, Changwon National University, Sarim-dong, Changwon, Kyungnam 641-773

Abstract Each oxidoreductase activity of the aerobic respiratory chain-linked NADH oxidase system in the marine bacterium *Pseudomonas nautica* was stimulated by monovalent cations including Na^+, Li^+, and K^+. In the presence of NADH or deamino-NADH as electron donors, QH_2 formation was approximately 1.3 fold higher in Na^+ than K^+ at a concentration of 0.08 M, whereas the other reductase activities were not significantly higher in Na^+ than K^+. The optimal pH of NADH (or deamino-NADH):ubiquinone-1 oxidoreductase was 9.0 in the presence of 0.08 M NaCl. The activity of NADH (or deamino-NADH): ubiquinone-1 oxidoreductase was about 33% inhibited by 60 μM 2-heptyl-4-hydroxyquinoline-*N*-oxide (HQNO). The activity of NADH (deamino-NADH): ubiquinone-1 oxidoreductase was about 32 to 38% inhibited by 80 μM rotenone, whereas the activity was highly resistant to capsaicin. On the other hand, electron transfer from NADH or deamino-NADH to ubiquinone-1 generated a membrane potential ($\Delta\Psi$) which was larger in the presence of Na^+ than that observed in the absence of Na^+. The $\Delta\Psi$ was almost completely collapsed by 5 μM carbonylcyanide *m*-chlorophenylhydrazone (CCCP), and approximately 50% inhibited by 100 μM rotenone, or 60 μM 2-heptyl-4-hydroxyquinoline (HQNO). HQNO, also, made the $\Delta\Psi$ very unstable. On the basis of the results, we suggest that the NADH: ubiquinone oxidoreductase of *P. nautica* is quite different in enzymatic and energetic properties compared to that of other marine halophilic bacteria.