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H^+-pumping NADH:Quinone Oxidoreductase of the Marine Bacterium *Pseudomonas nautica*

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Membranes of *Pseudomonas nautica*, grown aerobically on a complex medium, oxidized both NADH and deamino-NADH as substrates. The activity of membrane-bound NADH oxidase was activated by monovalent cations including Na^+, Li^+, and K^+. The activation by Na^+ was higher than that by Li^+ and K^+. The maximum activity of NADH oxidase was obtained at about pH 9.0 in the presence of 0.08 M NaCl. The NADH oxidase activity was completely inhibited by 60 μM 2-heptyl-4-hydroxyquinoline-N-oxide (HQNO), while the NADH: quinone oxidoreductase activity was about 37% inhibited by 60 μM HQNO. The activities of NADH oxidase and NADH:quinone oxidoreductase were about 40% inhibited by 60 μM rotenone. The fluorescence quenching technique revealed that electron transfer from NADH to ubiquinone-1 (Q-1) or oxygen generated a membrane potential ($\Delta\Psi$) which was larger and more stable in the presence of Na^+ than that observed in the absence of Na^+. However, the $\Delta\Psi$ was highly sensitive to a protonophore, carbonylcyanide *m*-chlorophenylhydrazone (CCCP) even at alkaline pH.