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Aerobic Respiratory Chain of the Marine Bacterium *Vibrio alginolyticus*

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Abstract

Aerobic respiratory chain of *Vibrio alginolyticus* possesses two different kinds of NADH oxidase systems, *i.e.*, Na⁺-dependent NADH oxidase system and Na⁺-independent NADH oxidase system. When deamino-NADH, which is the only substrate for Na⁺-dependent NADH oxidase system, was used as a substrate, the maximum activities of Na⁺-dependent NADH:quinone oxidoreductase and Na⁺-dependent NADH oxidase were obtained at about 0.06 M and 0.2 M NaCl, respectively. When NADH, which is a substrate for both Na⁺-dependent and Na⁺-independent NADH oxidase systems was used as a substrate, the NADH oxidase activity had a pH optimum at about 8.0. In contrast, when deamino-NADH was used as a substrate, the NADH oxidase activity had a pH optimum at about 9.0. On the other hand, inside-out membrane vesicles prepared from the wild-type bacterium did generate only a very small Δ pH by the NADH oxidase system, whereas inside-out membrane vesicles prepared from Nap1, which is a mutant defective in the Na⁺ pump, did generate Δ pH to a considerable extent by the NADH oxidase system. On the basis of the results, it was concluded that the respiratory chain-linked components of *V. alginolyticus* affected each other.