Morphological and functional characteristics of a novel Na^+/K^+-ATPase-immunoreactive, follicle-like structure in the gill septum of Japanese banded houndshark, *Triakis scyllium*

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In teleost fish, it is well established that the gill serves as an important ionoregulatory organ in addition to its primary function of respiratory gas exchanges. In elasmobranch fish, however, the ionoregulatory function of the gill is unclear, although mitochondria-rich (MR) cells have also been found in elasmobranch fish, those cells are considered to be important in acid/base regulation. In this study, we found novel cell aggregates with basolateral Na^+/K^+-ATPase (NKA) immunereactivity, in addition to NKA-immunoreactive MR cells which have already been described in the gill filament and lamella. The cell aggregates were found exclusively on the inter-filamental space of the gill septum, and we named these NKA-rich cell aggregates (NRCA). The NRCA cells form a single-layered follicular structure with a large common lumen leading to the external environment. The NRCA cells have well-developed microvilli on the apical membrane. A large number of vesicles were observed in the cytoplasm, and some of them were fused to the lateral membrane. The NRCA cells express Na^+/H^+ exchanger 3 and Ca^{2+} transporter 1. These results suggest that the NRCA is involved in the absorption of ions such as Ca^{2+}, and that the elasmobranch gill probably contributes to ionic homeostasis.