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## Morphological analysis of olfactory receptor cells using whole-mount preparations

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The distribution and entire shape of olfactory receptor cells were investigated by means of whole-mount preparations of the nasal mucosa. Whole mucosa isolated from the nasal septum of rats was processed, as "a free-floating section", and examined by the avidin-biotin complex (ABC) method using antisera against protein gene product 9.5 (PGP 9.5) and calbindin. Essentially all receptor cells were immunolabeled with the PGP 9.5 antiserum, but only half of PGP 9.5-immunoreactive cells were calbindin-immunoreactive. In the immunostaining of whole-mount preparations, pretreatment of tissues by freeze-thawing and dipping in ethanol and xylene greatly improved the permeability of antibodies. Overview of the nasal septum showed that the dorsal and ventral portions of the rostral olfactory area extended deeply into the

respiratory area, making a "semi-lunar" shape. The boundary between the two areas was clearly demarcated, although several receptor cells were scattered in the respiratory area near the boundary. Observation at higher magnification clearly demonstrated that several axons derived from perikarya gathered to form nerve bundles showing a dendritic pattern. Proximal axons close to perikarya displayed beaded structures with intense immunoreactivity. They were electron-microscopically identified as swollen portions of axons which might be formed in association with the axonal flow. The present study showed that whole-mount preparation of the nasal mucosa for immunohistochemistry is a useful tool to analyze the morphology of olfactory receptor cells and axons.

## Observation of type B intercalated cells in the rat kidney by a monoclonal antibody

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The collecting duct in the kidney consists of three structurally and functionally distinct cell types: principal cells, type A intercalated cells and type B intercalated cells. Intercalated cells are engaged in the regulation of acid-base balance. It is believed that type A intercalated cells secrete  $H^+$ , whereas type B intercalated

cells secrete  $HCO_3^-$ . Although some histochemical methods have been reported to distinguish two types of intercalated cells on tissue sections, cell-specific markers of type B cells have not been found.

Recently, Oriksa et al. (1996) reported that a great number of macrophagic cells were