

Receptor Mechanisms Of Mouse Taste Receptor Cells To Various Salts

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Summary

We investigated receptor mechanisms of mouse taste receptors to salts under voltage clamp conditions using a chamber which controlled ionic compositions on apical and basolateral membranes of taste cells in a peeled tongue epithelium separately. a) The tongue epithelia of mouse in a range of 2 ~ 80 weeks old were peeled with a hypodermic injection of collagenase into the tongue according to Misteretta (1971). The epithelium on the chamber prevented any diffusion of solutions applied on the receptor membrane to the basolateral membrane. Therefore, deionized water perfusing the receptor membrane did not dilute a physiological saline solution applied to the basolateral membrane. b) Depolarizing voltage steps produced transient inward currents followed by slow developing outward currents and transient outward currents. The outward currents were blocked by Cs added into the patch electrode, indicating a delayed rectifier K channel may be responsible to the current. c) Application of either 100 mM NaCl, KCl, or CaCl₂ solutions on the apical membrane adapted to deionized water produced slow developing inward currents and increased the membrane conductance. Although the further experiments were needed, analyses of voltage dependence of the inward currents suggest that the salts increase conductance at the basolateral membrane. The present results indicate that this method is useful to investigate the receptor mechanisms.