

Transduction mechanism of umami-like taste involved in salt

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Summary

We performed patch-clamp recordings from non-dissociated mouse taste cells within the taste bud while applying a taste stimulus to the pore. Under this condition, rapid responses to 0.5 M NaCl and suppression by 5~50 μ M amiloride were obtained. We could confirm the presence of amiloride-sensitive and -insensitive taste cells. Salt-induced responses of the amiloride-sensitive taste cells were not completely suppressed by amiloride. In adaptation to the standard extracellular solution, salt-induced responses in 50% of taste cells consisted of generation of the inward current at negative potential level and suppression of the outward current at the positive potential level (Type I). The rest of cells examined showed either generation of the inward current (Type II) or suppression of the outward current (Type III). Type III responses were obtained only from taste cells of BALB/c mice. The similar suppression of the outward current was obtained by 500 μ M 8cpt-cAMP, a membrane permeable analog of cAMP. The absence of K^+ channels was demonstrated by localized application of 10 mM Ba^{2+} to the pore. The suppression of stationary K^+ current by cyclic nucleotide via phosphorylation has been accepted in the transduction pathway of sweet taste. Therefore, the suppression of the outward current generated by salt may be a transduction pathway of the umami-like taste quality involved in salt.