

# Measurement of Salty Taste Enhancing Activity Using Novel Salt Taste Receptor TMC4.

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## Summary

The average of salt intake is 10.9 g/day for men and 9.3 g/day for women, far from the WHO recommended 5 g/day in Japan. Reduce of salt intake is difficult, because salt is tasty so reducing salt makes the food itself taste bad. Although various ideas have been devised to reduce salt without compromising the taste, it is quite difficult to consistently reduce salt intake.

In research on salt taste reception, ENaC was reported that it responds to low concentrations of salt. It is known that low concentrations of salt are preferred, but high concentrations of salt are avoided. It has been suggested that ENaC responds to low concentrations of salt, while a different receptor molecule responds to high concentrations of salt. In this situation, we found the voltage-dependent chloride ion channel TMC4, which responds to high concentrations of salt and receives chloride ions. In this study, from the view point of food chemistry, we screened for substances that enhance saltiness using the new salt taste receptor, TMC4.

The research method was to express human TMC4 (hTMC4) in HEK293T cells and we performed electrophysiological analysis using the whole-cell patch clamp method. Capsaicin, which has already been reported to have a salt taste enhancing effect, was used as a test sample. It is known that hTMC4 generates an outward current at positive potentials, and the change in the magnitude of this outward current was used as an index of the test substance's activation of hTMC4. As a result, the addition of 1  $\mu$ M capsaicin increased the current at +60 mV by 1.5 times compared to vehicle. No other spice components showed a high value. We then searched for capsaicin-related compounds using SciFinder and investigated the activation level of the nine available compounds, but none showed a current greater than that of capsaicin.