

## Screening of Salt-Taste Enhancer Using Mutant Lacking Salt-Taste

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### Summary

Sodium chloride (NaCl) is a major substance to induce salt taste. Salt taste is an important factor for comfortable meals, however excessive intake of NaCl is higher risk for various diseases including high blood pressure, renal dysfunction and arrhythmia. Thus, artificial salt tastant or enhancer of salt taste is needed.

To explore novel substances, which modulate salt taste, we used *Drosophila melanogaster*. As mammal, *Drosophila* also prefers moderate concentration of NaCl and LiCl, and the preference is suppressed by amiloride. Moreover, in both mammal and fly, the salt taste sensitivity is enhanced by L-Arg.

First, by two-choice test, we examined the preference for various concentration of NaCl and found that 5 mM NaCl is closed to threshold. We obtained about 1000 molecules from Drug Discovery Initiative in Tokyo University. Then, we added each molecule to 5 mM NaCl solution and examined the preference to the salt solutions. We have tested 716 molecules and found that 22 molecules enhanced the preference for 5 mM NaCl. Previously, we found that one strain, OGS-4, does not show any preference to NaCl solutions. Since this fly normally exhibits the preference to sugars and avoidance to bitter substances, OGS-4 specifically lacks salt preference. We tested whether the 22 molecules induce preference in the OGS-4, and found that the 21 molecules failed to induce preference in the OGS-4 flies. These results imply that the 21 molecules specifically enhance salt taste in fly. In future, we need to examine whether these molecules induce salt taste in mammals.