

# The Role of Dopaminergic System in the Synergic Effect of Salty and Umami on Food Palatability

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## Summary

Facilitation effect of salty taste on our eating is important for the quality of our daily meals. Interestingly, umami taste, which is another sense of taste, has known to enhance the palatability of salty food in human. In the present study, the facilitative effect of umami on salt palatability was investigated in the experimental animal model, mice. The dopamine release change in the nucleus accumbens during mice's salty reward consumption was also investigated. Salty reward seeking behavior in mice was assessed using progressive ratio schedule in the licking-based operant behavior paradigm. In the experiment 1, the number of licks to earn NaCl solution reward was increased as the dose of NaCl was increased in salt depleted mice. However, this was not observed when salt repleted. In the experiment 2, salt depleted mice showed more licks when the amount of umami tastant, monosodium-glutamate (MSG), mixed with NaCl solution was increased. This was not observed in the repleted mice. In the experiment 3, accumbal dopamine release was measured by taking advantage of fluorescent dopamine sensor, GRAB-DA. The dopamine release was increased more after the consumption of high NaCl reward or NaCl + MSG reward compared to low NaCl reward in a certain trial. However, this tendency was not clear when all the trials were analyzed. Results of the present study showed the facilitative effect of umami on salt palatability in mice for the first time. The possible role of accumbal dopamine in this effect needs to be further investigated in the future.