

## The Involvement 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 and its function on the salt-seeking behavior were also investigated. Salty reward-seeking behavior in mice was assessed using a progressive ratio schedule in the licking-based operant behavior paradigm. In experiment 1, salt-depleted mice showed more licks when the amount of umami tastant, monopotassium glutamate (MPG), and inosinic acid (IMP), mixed with NaCl solution was increased. In experiment 2, accumbal dopamine release was measured by taking advantage of the fluorescent dopamine sensor, GRAB-DA. The dopamine release was increased more after the consumption of NaCl + Umami reward compared to NaCl only reward. In experiment 3, the chemogenetic DREADD inhibition of midbrain dopamine neurons decreased both salt-seeking behavior and the enhancement effect of umami. Results of the present study showed the facilitative effect of umami on salt palatability in mice for the first time. It was also suggested that the activity of dopaminergic neurons functionally regulates both the salt-seeking behavior and the enhancement effect of umami on salt consumption.