

**Taste Signaling Mechanisms for the Regulation of Food Intake:
Approaches to Establishment for Taste Health Science**

Yuzo Ninomiya

(Kyushu University Graduate School of Dental Sciences, Professor)

【Outline of survey】

Taste is sensory system primarily devoted to the selection of food and required minerals. It also achieves avoidance of potentially harmful compounds. Sweetsensing is thought to be essential for detection of carbohydrate sources of calories. Sweet stimuli elicit cephalic phase responses of particular hormones in the circulation and cause generation of satiety factors at least in rats. This suggests that neural input from sweet receptors to the brain serves as a signal that provokes the release of mediators involved in the regulation of food intake, and its dysfunction may be one of factors leading to life style-related disease like obesity or diabetes.

In the present study, to clarify functional roles of taste signaling on regulation of food intake, we examined:

- 1) mechanisms for formation of specific taste quality coding lines with corresponding classes of taste cell and axons,
- 2) possible modulation of taste sensitivities by hormones and its underlining mechanisms,
- 3) human taste sensitivities and polymorphisms of taste-relating genes,
- 4) genetic basis for taste sensitivities by using artificial human taste receptor cells

【Expected results】

In the present study, we investigate mechanisms on formation of taste quality coding lines in relation to behavioral preference and avoidance, and its roles on the regulation of food intake. Especially, we explore modulation of sweet and salty taste sensitivities by particular hormones whose dysfunction may increase probabilities for producing obesity and high blood pressure. We employed various experimental methods including molecular genetics, neural and behavioral response analyses. We hope our results provide new tools including new taste modifiers (i.e., sweet enhancer) for anti-obesity and –high blood pressure therapies.

【References by the principal researcher】

- Talavera K. et al., : Heat-activation of the taste channel TRPM5 underlies thermal sensitivity to sweet. Nature 438: 1022-1025 (2005)
- Kawai K. et al., Leptin as a modulator of sweet taste sensitivities in mice. Proc. Natl. Acad. Sci. USA., 97: 11044-11049 (2000)

【Term of project】 FY2006 - 2010

【Budget allocation】 33,800,000 yen

【Homepage address】

n o n e