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PRESS RELEASE（2019/02/05）

A cluster of neurons discovered: New evidence for fat as a primary taste quality

Keiko Yasumatsu, Yuzo Ninomiya and collaborators uncovered whether coding of oral fat perception is mediated by clusters of lipid-specific (F-type) fibers, which would strengthen the concept of fat as a sixth primary taste quality. They used single fiber recordings of mouse chorda tympani nerve and behavioral assays to investigate whether fatty acids elicit a specific taste quality. In the last decade, GPR40, GPR120 and transporter CD36 have been found to play roles in fatty acid detection and/or preference in taste systems. In the present study, 17.9% of taste fibers showed a maximal response to fatty acid (F - type) ,and half or more of S(sucrose) - and M(glutamate) - type fibres showed responses to fatty acids in the chorda tympani nerve of wild type mice. F-type fibers greatly decreased in GPR12-KO mice. The KO mice conditioned to avoid linoleic acid showed generalized stimulus avoidances for glutamate, indicating qualitative similarity between linoleic acid and glutamate. The KO mice showed a higher generalization threshold for linoleic acid than that of WT mice.

The study revealed that fatty acid taste have a unique quality owing to the discovery of F - type fibres, with GPR120 involved in neural information pathways for a unique quality in the mouse CT nerve. GPR120 plays roles in distinguishing fatty acid taste from other primary tastes and the detection of low linoleic acid concentrations.

Owing to the importance of essential and/or omega - 3 fatty acid intake, GPR120 may contribute to fatty acid detection in the anterior part of the tongue.

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The study was published in online journal Acta physiologica entitled "*Fatty acid taste quality information via GPR1 20 in the anterior tongue of mice*"in Nov 19, 2018.

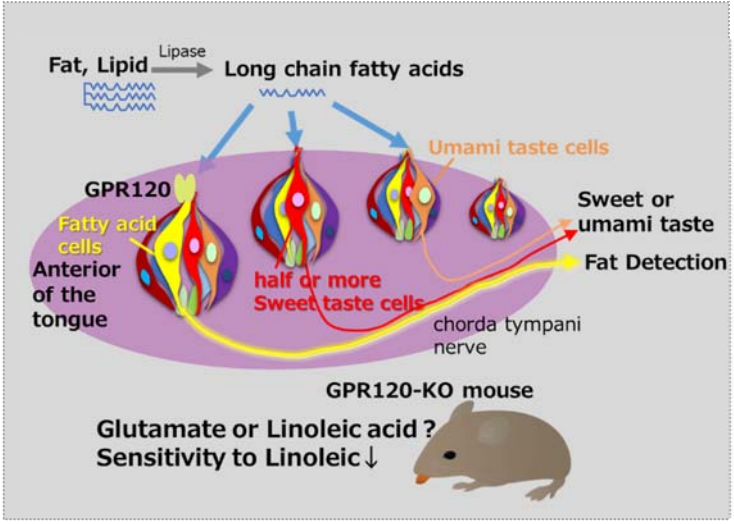

Figure:
Fats and oils in foods are hydrolyzed to fatty acids by saliva lipases and are transmitted to the brain by nerves connected with taste cells via receptors and transporters. The cluster of nerves showing the maximal response to fatty acid were found and GPR120 receptor was revealed to be involved in the responses with a greater response to linoleic acid (one of essential fatty acids) than oleic acid. Mice genetically lacking GPR120 could not distinguish between umami and linoleic acid and could not detect low concentration of linoleic acid that wild type mice detected.

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