The 17th International Symposium on Molecular and Neural Mechanisms of Taste and Olfactory Perception (ISMNTOP/YRUF/AISCRIB 2018)

in conjunction with

Special Events celebrating the 50th Anniversary of Monell Chemical Senses Center

第17回国際シンポジウム"味覚嗅覚の分子神経機構"

（うま味若手フォーラム/アジア国際シンポジウム"化学受容と摂食行動"

2018）/米国モネル化学感覚センター50周年記念イベント

Organizer: Yuzo Ninomiya

Research and Development Center for Five-Sense Devices

Kyushu University

PROGRAM & ABSTRACTS

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CONTACT

Secretary: Ryusuke Yoshida/Mayuko Inoue
Division of Sensory Physiology,
Research and Development Center for Five-Sense Devices
Kyushu University
Collabo-station 11, 307/308, 3-1-1 Maidashi, Higashi-ku,
Fukuoka 812-8582, Japan
Tel: +81-92-642-4620 (Mayuko Inoue), Fax: +81-92-642-4620
e-mail: yoshida.ryusuke.319@m.kyushu-u.ac.jp

ISMNTOP website:
http://ismntop.webcrow.jp/ISNMTOP/ISMNTOP.html

The negative effect of High Fat Diet on the olfactory system in *Drosophila melanogaster*

Dong In Kim, Rustem Ilyasov, Gwang-Rae Noh, Gi Youn Han, Soo Ho Lim and Hyung Wook Kwon*

Department of Life Sciences and Convergence Research Center for Insect Vectors, Incheon National University, 119 Academy-ro, Yeonsu-gu, Incheon 22012, Republic of Korea

High-fat diet (HFD) often causes obesity, heart disease, cancer and it has detrimental effects on the sensory system. In particular, sensory-mediated responses are crucial for maintaining energy balance, as they are involved in a metabolic regulation; however, little is known about the impact of HFD-induced stress on sensory system. We have used a Drosophila melanogaster model to gain insight on how HFD-induced stress affects physiological, behavioral, and transcriptional changes related with olfactory and nutrient-related signaling. We demonstrated that lifespan and locomotor activiy in HFD-treated flies decreased and that olfactory sensitivity and behavioral responses to odorants were changed. Olfactory sensitivity to eight of ten odorants after 14 days on HFD treatment were reduced, while behavioral attraction was increased to benzaldehyde and 1-hexanol in flies that were treated with HFD for 7 days. This behavioral and physiological modification by HFD treatment was accompanied by a significant decrease in DmOrco gene expression in a peripheral olfactory organ, suggesting that is could be involved in the action of metabolic and sensory signal. Gene expression profiles of antennae showed significant differences on the olfactory receptors, odorant-binding proteins, and insulin signaling. Our results suggested that olfactory sensitivity and behavioral responses to HFD-induced stress are mediated through olfactory and nutrient-related signaling pathways.