

University of Houston - Biomedical Engineering Seminar

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Via Zoom:

<https://uh-edu-cougarnet.zoom.us/j/97219977403?pwd=VOIRTGhJMTdDQ1dwUDRJcGhYNTVFZz09>

Mapping Neurocircuits for Emotional Eating



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Abstract

We have identified a specific brain neural pathway that co-regulates feeding and behavioral signs of stress and fear. Our research focuses on the hypothalamus, a brain region known to regulate feeding and body weight. Lesions of lateral hypothalamus (LH) and paraventricular hypothalamus (PVH), cause reduced body weight and obesity, respectively. We have identified differential roles of different components of the projections from LH to PVH. While the GABAergic component induces voracious feeding, the glutamatergic component induces self-grooming and jumping, indicative of stress and fear. We further PVH neurons project to the ventral part of the lateral septum (LS), a brain region known to regulate aggression and this projection strongly inhibits feeding and promotes behavioral signs of stress and fear. Lastly, the PVH projected LS neurons, which inhibited, promote massive obesity. Thus, the LH to PVH to LS circuit co-regulates feeding and emotion (stress and fear). The results help to understand the underlying mechanisms for overeating/obesity and anorexia/anxiety.

Biosketch

Dr. Tong is currently Professor and Cullen Chair in Molecular Medicine of IMM of McGovern Medical School. He also holds adjunct positions in Neurobiology and Anatomy at McGovern and Endocrine at Baylor. He received his B.S. in Biology and M.S. in Physiology. His PhD is in Neural and Behavioral Sciences from SUNY. During his postdoc training at Beth Israel Deaconess and Harvard he used extensive mouse genetics to study hypothalamic neurocircuits and feeding behaviors related to obesity and diabetes. In 2009, he joined IMM of UTHealth. His research has been directed to 1) map novel neurons and neurocircuits for feeding and related behaviors; 2) understand brain control of feeding and obesity pathogenesis; and 3) basic mechanisms underlying the brain in glucose homeostasis related to diabetes. Dr. Tong has published numerous research articles in top journals including Nature, Cell, Nature Neurosciences, Nature Metabolism, Nature Communications, Science Advances etc.