ELSC-ICNC Seminar: Gilad Barnea

May 2, 2013

On the topic of: "The neural circuitry underlying olfactory perception"

ELSC & ICNC cordially invite you

to the lecture given by:

Gilad Barnea
Robert and Nancy Carney Assistant Professor of Neuroscience, Department of Neuroscience, Brown University

On the topic of:

"The neural circuitry underlying olfactory perception"

The lecture will be held on Thursday, May 2, 2013
at 17:00, at ELSC-ICNC: Silverman Bldg., 3rd Wing, 6th Floor, Edmond J. Safra Campus

Light refreshments at 16:45

Abstract:

The mammalian olfactory system responds both to neutral odors, whose significance for the organism is assigned by learning, and to odors that elicit innate behaviors. Most sensory neurons in the olfactory epithelium in the nose express members of the odorant receptor (OR) family of G protein coupled receptors. Each sensory neuron expresses one OR out of about 1300 possibilities. Whereas the neurons that express the same receptor are randomly dispersed within a broad zone in the epithelium, their axons converge on the same spatially-fixed neuropil structures, called glomeruli, in the olfactory bulb, the first relay for olfactory information in the brain. The linkage between the identity of the OR that an olfactory sensory neuron expresses and the site to which it projects its axon suggests a model in which the receptor itself plays an instructive role in guidance. I will present our recent studies suggesting that homotypic interactions between neurons expressing the same OR are important for proper guidance. Our studies further reveal the existence of a critical period for the imprinting of glomeruli as targets for sensory neurons expressing given ORs. The main olfactory epithelium contains another subset of sensory neurons that express chemoreceptors belonging to the trace amine associated receptor (TAAR) family. TAARs respond to volatile amines, many of which elicit innate aversion in rodents. I will present our analysis of the molecular mechanisms controlling the expression of a single TAAR per neuron and our characterization of the projection patterns of TAAR-expressing neurons (TRNs) to the olfactory bulb. Our studies suggest that the TRNs form a distinct olfactory sub-system. Finally, I will present our attempts to develop a molecular system for transsynaptic labeling and manipulation of neural circuits.
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