The 132nd iCeMS
SEMINAR

Thu 7 Mar 2013
10:30-11:30

Cellular mechanisms regulating patterns of converging inputs onto a retinal neuron

Lecturer: **Dr. Haruhisa Okawa**

Rachel Wong Lab
Department of Biological Structure
University of Washington

Venue: **2nd Floor Seminar Room A**
Faculty of Medicine Bldg. G, Kyoto University

Neurons receive and integrate input from a diversity of presynaptic cell types. During development, neurons gain synaptic specificity by eliminating unwanted connections, while establishing a stereotypic number of connections with each synaptic partner type. Understanding the cellular mechanisms that regulate synapse numbers of input types that highly overlap on the dendritic arbor has been challenging. We took advantage of the vertebrate retina with compact circuitry that readily facilitated visualization and identification of all the input onto a given neuron. By perturbing neurotransmission, or by altering the composition of presynaptic partner types in vivo, we discovered a cell-autonomous role for neural activity, without synaptic competition, in defining connectivity between bipolar cells and ganglion cells. However, neighboring converging afferents also influence each other's ability to capture synaptic territory, likely via physical constraints on their axonal territories. Our findings emphasize coordinated regulation by cell autonomous and cell non-autonomous mechanisms in assembling specific patterns of synaptic convergence onto a neuron.

iCeMS
KYOTO UNIVERSITY
WPI Research Center

wpi
World Premier International
Research Center Initiative