PROGRESS IN NEUROSCIENCE PINS

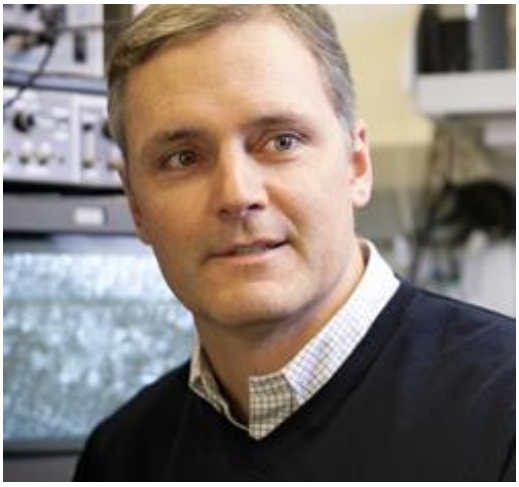
Seminar Series of the
Brain & Mind Research Institute
Cornell Medical College (WCMC)
&
The Graduate Program in Neuroscience of
WCMC and Sloan Kettering Institute

Thursday, 12/7/17, 4 PM, coffee at 3:45 PM

Weill Auditorium

"Diverse Synaptic Signaling in Retinal Amacrine Cells"

Jeffrey Diamond, Ph.D., Senior Investigator, National Institute of Neurological Disorders and Stroke, National Institutes of Health



Abstract

Our laboratory seeks to understand how the brain receives, computes, encodes and transmits information. More specifically, we'd like to learn which biophysical and morphological features equip synapses, neurons and networks to perform these tasks. The retina is a model system for the study of neuronal information processing: We can deliver precisely defined physiological stimuli and record with high fidelity the output of the retina, as well as activity at various points within the network; in addition, retinal circuitry is particularly well understood, enabling us to interpret more directly the impact of synaptic and cellular mechanisms on circuit function; finally, new genetic tools permit us to identify specific neuronal subtypes, record their activity and manipulate their influence on the network. I will present recent experiments in the lab that exploit these advantages to examine how synapses and neurons within the retinal circuit perform specific visual computations. I will focus on amacrine cells, interneurons in the inner retina that confer spatiotemporal complexity on the visual signals sent by ganglion cells to the rest of the brain.

Recent Relevant Publications:

1. Ding, H, Smith, RG, Poleg-Polsky, A, **Diamond, JS**, Briggman, KL (2016) Species-specific wiring for direction selectivity in the mammalian retina. *Nature* **535**, 105-110. PMC4959608.
2. Grimes, WN, Zhang, J, Graydon, CW, Kachar, B and **Diamond, JS** (2010) Retinal parallel processors: More than 100 independent microcircuits operate within a single interneuron. *Neuron* **65**, 873-885. PMC2967021.
3. Oesch, NW and **Diamond, JS** (2011) Ribbon synapses compute temporal contrast and encode luminance in retinal rod bipolar cells. *Nat. Neurosci*. **14**, 1555-1561. PMC3225507.

Weill Cornell Medicine

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