BERNICE GRAFSTEIN LECTURE
(PINS)

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

Thursday, 4/27/17, 4 PM, coffee at 3:45 PM

Weill Auditorium

Cocktail Reception in Griffis Faculty Club to follow, 5:15 PM

"Circuit mechanisms of response flexibility in mouse auditory cortex"

Andrea Hasenstaub, Ph.D., Assistant Professor of Otolaryngology, Head and Neck Surgery, University of California, San Francisco

Abstract

The cerebral cortex is the seat of the social, linguistic, and cognitive functions key to human identity. Within the cortex, diverse types of local circuit inhibitory neuron play vital roles in regulating and timing activity, and are key mediators of long-term developmental plasticity. Central auditory processing disorders, such as hyperacusis or tinnitus, may result in part from failure of cortical inhibitory networks to properly control the strength, timing, or plasticity of excitatory activity. These neurons' dysfunction is also implicated in broader neurodevelopmental disorders including schizophrenia, autism, epilepsy, and bipolar disorder. Treatments for these common and devastating diseases will require both a conceptual understanding of cortical interneurons' circuit functions, and a mechanistic understanding of their interactions.

My research aims to understand the cellular and circuit operation of these inhibitory networks. My laboratory combines electrophysiological measurements of auditory responses in the auditory cortex of awake, behaving mice, with quantitative genetic analysis, modeling of their interactions, and optical, genetic, and pharmacological manipulations, to establish biophysical and circuit mechanisms underlying their patterned activity. This approach provides a circuit context in which genetic findings can be placed, and identifies potential circuit mechanisms underlying behavioral phenotypes – providing a critical link between genetic and behavioral studies of brain disease.

Recent Relevant Publications:

1. 1. Seybold BA, Phillips EA, Schreiner CE, Hasenstaub AR. Inhibitory Actions Unified by Network Integration. Neuron. 2015 Sep 23; 87(6):1181-92. PMID: 26402602.
2. 2. Phillips EA, Hasenstaub AR. Asymmetric effects of activating and inactivating cortical interneurons. Elife. 2016 Oct 10; 5. PMID: 27719761. PMCID: PMC5123863

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