



PROGRESS IN NEUROSCIENCE 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, 4/30/15, 4 PM, coffee at 3:45 PM
Weill Auditorium

“In Vivo Analysis of Astrocyte Network Activity”

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Abstract:



My laboratory is interested in understanding how interactions between neurons and glial cells contribute to CNS development, neuromodulation in the adult brain, and neurodegeneration in diseases such as ALS. Our recent studies have focused on defining the mechanisms responsible for activating astrocyte networks in the adult brain and the physiological significance of this activity. Our experiments indicate that there are two functionally distinct, but interdependent modes of Ca^{2+} signaling in astrocytes. I will discuss the development of new conditional transgenic mouse lines that allow visualization of Ca^{2+} dynamics in distinct cell types, the behavioral states under which astrocyte networks become activated *in vivo*, and the mechanisms that trigger the two distinct types of Ca^{2+} transients in these cells. In addition, I will describe new methodologies that we are developing to enable visualization of astrocyte network activity in freely moving animals.

Recent relevant publications:

Paukert M, Agarwal A, Cha J, Doze VA, Kang J, and Bergles DE (2014) Norepinephrine controls astroglial responsiveness to local circuit activity. *Neuron*, 82:1263-1270.

Otsu Y, Couchman K, Lyons DG, Collot M, Agarwal A, Mallet J-M, Pfrieder FW, Bergles DE, and Chrapak S (2014) Calcium dynamics in astrocyte processes during neurovascular coupling. *Nature Neuroscience*, Epub Dec. 22, 2014.

Nimmerjahn A and Bergles DE (2015) Large scale recording of astrocyte activity. *Current Opinions in Neurobiology*. Epub, February 6, 2015.



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