Imaging astrocyte calcium signals in health and disease

I will report data from our laboratory on astrocyte calcium transients and what they may mean for neuronal function. I will also report the development and characterization of a genetically targeted calcium sensor that is tethered to the plasma membrane, thereby allowing the measurement of calcium signals in hitherto inaccessible parts of astrocytes including their processes. I will show that this new sensor can measure near-membrane calcium signals evoked by single action potential mediated neurotransmitter release, and also identify novel, highly localised and frequent spontaneous calcium signals in astrocyte somata and processes that are not detected by conventional calcium sensors. This new technique will allow us, and others, to provide novel insights into the regulation of astrocyte roles in synaptic function and vascular regulation, which are exciting, emerging topics that are of broad interest and importance in neuroscience.

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DATE • TIME • LOCATION:
December 7, 2010, 4:00 PM, 105 Agricultural Engineering Building