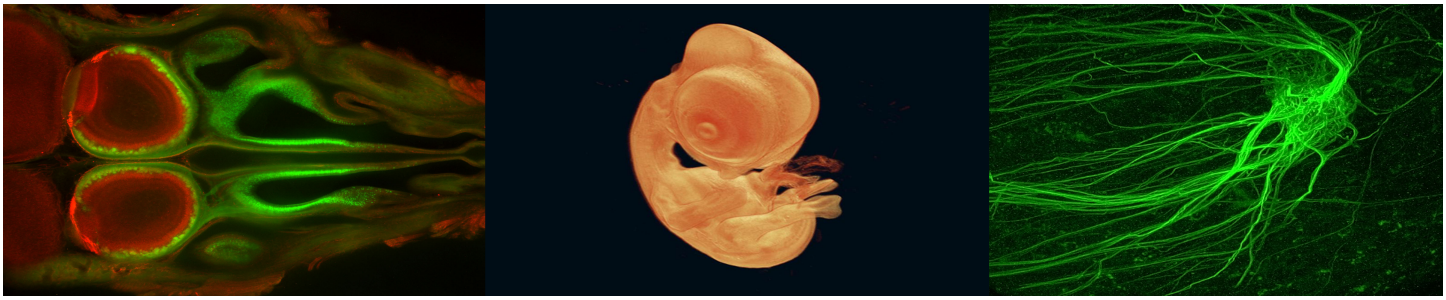

Visionary Seminar Series at USC

Monday, March 30, 2015 at 2 pm

Ray R Irani Hall Conference Room 101

Viviana Gradinaru, PhD

Assistant Professor of Biology and Biological Engineering
California Institute of Technology

"Visualizing the Activity and Anatomy of Brain Circuits: Optogenetic Sensors and Tissue Clearing Approaches"

The Gradinaru Research Group at Caltech studies the mechanism of action for **deep brain stimulation** (DBS), a therapeutical option for motor and mood disorders such as Parkinson's and depression. Dr. Gradinaru's previous work at Stanford developed and applied optogenetics (cell-type specific bi-directional control of neuronal activity with light) to animal models of Parkinson's to gain a mechanistic understanding of DBS. Her studies highlighted the importance of selectively controlling axons and not local cell bodies in modulating behavior, a principle that might play a generalized role across many effective DBS paradigms. In addition to ameliorating motor symptoms in Parkinson's disease, DBS might also aid long-term cell viability by regulating perturbed excitatory activity and promoting growth factor release. *Therefore the group is now particularly interested in the long-term effects of DBS on neuronal health, function, and ultimately behavior.*

To aid this process, Dr. Gradinaru's group continues to develop tools and methods for neuroscience (optogenetic actuators and voltage sensors; tissue clearing, e.g. CLARITY, and imaging). CLARITY renders the tissue transparent for easy visualization and identification of cellular components and their molecular identity without slicing. This method complements optogenetics, in that it can reveal, with ease, circuit-wide effects of optogenetic manipulations and also aid in mapping novel circuits that need tuning in disease.

Dr. Gradinaru is a Pew Scholar, has been awarded the NIH Director's New Innovator Award, and she is a member of the Allen Brain Institute Next Generation Leaders Council.

Host: Provost Professor Scott Fraser
Tel: 213-740-2233 http://bioimaging.usc.edu/events.html#