Bi/CNS/NB 164 – Tools of Neurobiology – Fall 2016

Ten professors in nine weeks! Offers a broad survey of scientific methods and approaches in modern neurobiology. The focus is on understanding the tools of the discipline, and their use will be illustrated with current research results. Topics include: molecular genetics, disease models, transgenic and knock-in technology, virus tools, tracing methods, gene profiling, light and electron microscopy, optogenetics, optical and electrical recording, neural coding, quantitative behavior, modeling and theory.

Prerequisites: Bi/CNS/NB 150 or equivalent.

Instructors: Meister and course faculty
Teaching Fellow: Kyu Hyun Lee

Location: Wed and Fri 1:00-2:30 pm, BBB Room B101 (Bldg 76 basement north end)

Topics by week (subject to change without notice):

Sep 28 - 30: Markus Meister – Electrophysiology
Oct 5 - 7: Michael Dickinson – Behavioral measurements, automation, and analysis
Oct 12 - 14: Viviana Gradinaru – Optogenetics
Oct 19 - 21: Carlos Lois – Biochemical and transgenic approaches
Oct 26 - 28: Doris Tsao – Functional MRI and population coding
Nov 2 - 4: Betty Hong – Synaptic physiology. Light and electron microscopy
Nov 9: David Anderson – Genetic methods for cell typing and circuit tracing
Nov 11: Ben Deverman – Viral vectors as gene delivery tools
Nov 16 - 18: Thanos Siapas – Multi-neuron analysis and network models
Nov 23 - 30: Yuki Oka – Molecular and genetic tools for behavioral neurobiology

Reading: For introduction, read the BRAIN 2025 Report on Neurotechnologies. Also check out the recent special issue of Nature Neuroscience of Sept 2016. Further readings to be assigned weekly.

Grading: Based on class discussion, weekly assignments, and final term paper.