Yuh-Nung Jan, PhD

Summer Lab Size: 20

Local Summer Program: http://graduate.ucsf.edu/srtp
Program Dates: May 31-August 3, 2016 (Dates for 2017 should be similar)

University of California - San Francisco
Biophysics, Neuroscience

How Do Different Types of Neurons Acquire Their Distinctive Dendritic Morphology?
Since dendrites are the antennas for neurons to receive information, it is important to know how neurons acquire their distinctive dendritic morphology. Our approach is to use Drosophila (fruit fly) genetics to identify the essential molecular components. The Drosophila dendritic arborization (da) neurons are sensory neurons with a fairly elaborate dendritic branching pattern. They can be subdivided into four classes, each with distinctive dendritic morphology. We are using forward genetics of Drosophila to identify genes that control the development of the dendritic morphology of those da neurons. These studies have begun to provide us with molecular insights into how neurons acquire their class-specific dendritic morphology. We have also been working on the influence of dendritic morphology on neuronal function.

Students will participate in one or more of the following research areas: (1) Genetic screening of mutants affecting dendrite development. This will involve fly genetics and confocal microscopy work. (2) Phenotypic characterization of Drosophila mutants. This will involve learning Drosophila anatomy, immunocytochemistry, molecular genetics, and possibly electrophysiology. (3) Since many molecular mechanisms controlling various biological processes are well conserved during evolution, we presume the control of dendrite development is no exception. We have begun to extend our findings from Drosophila to the vertebrates. This will involve finding vertebrate homologs of the genes we identified from Drosophila (by bioinformatics or by cloning) and testing their role in controlling dendrite development by studying the effect of transfecting those genes into cultured vertebrate neurons.