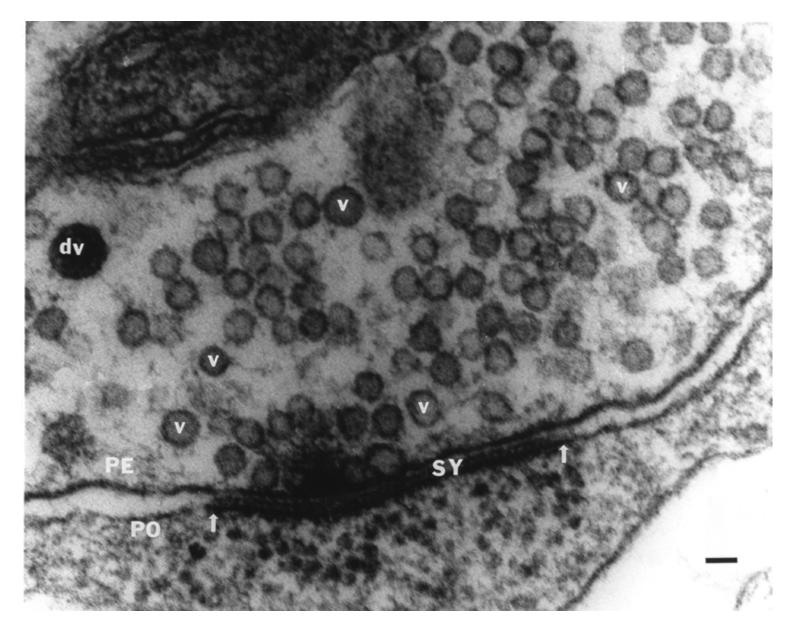
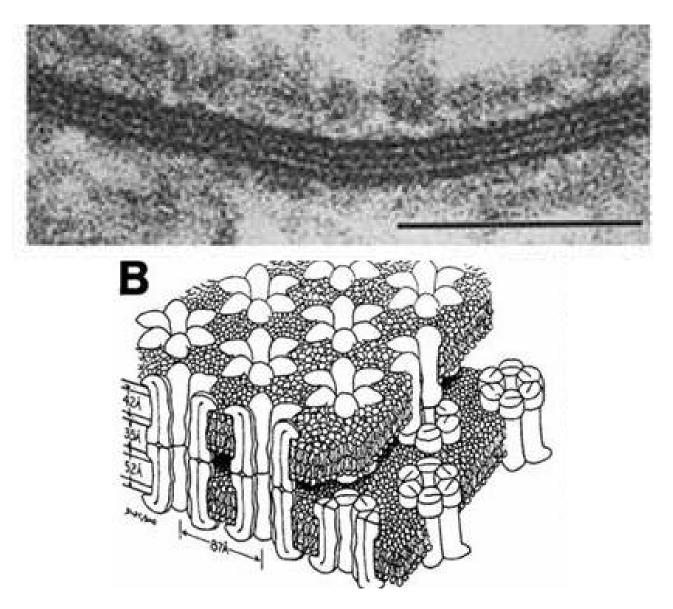
### A chemical synapse, by EM



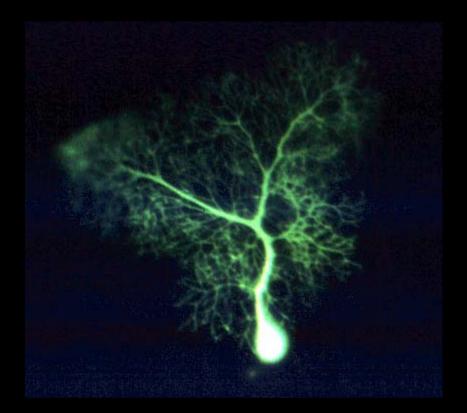
http://web.as.uky.edu/Biology/faculty/cooper/CooperRes2.htm

An electrical synapse, by EM



http://electroneubio.secyt.gov.ar/Bennett-neurons'electrical\_synchronization.htm

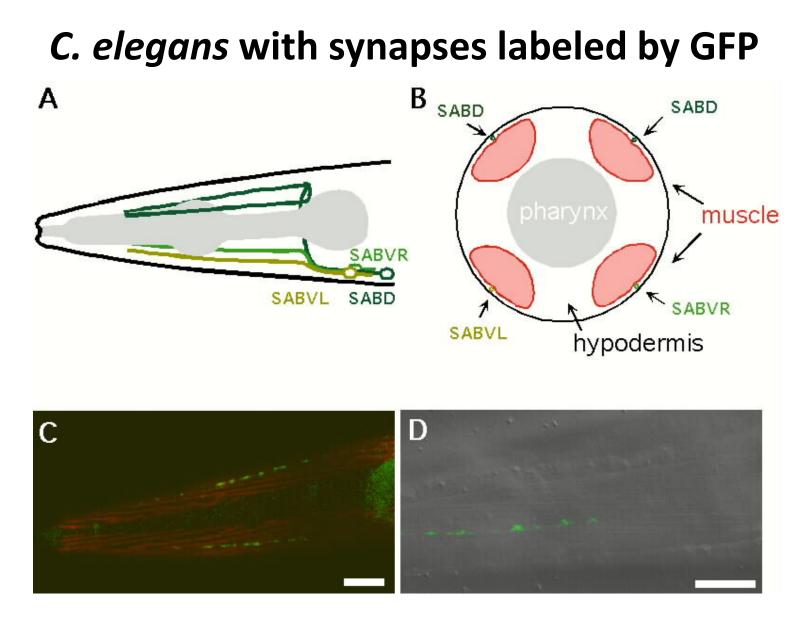
# Purkinje neuron filled with fluorescent dye and viewed with a light microscope



http://education.med.nyu.edu/courses/brainandbehavior/courseware/neurohist/html/0101.html

## **Drosophila** larva with GFP expressed in a subset of sensory neurons

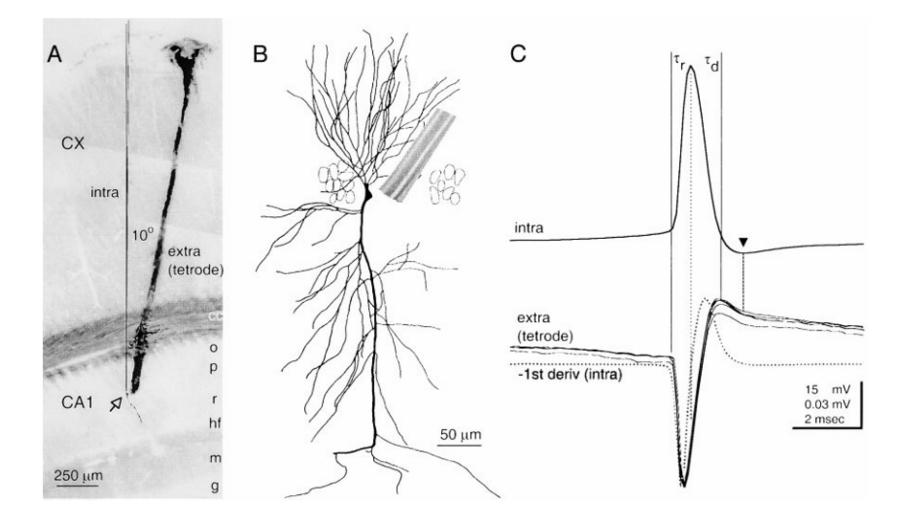
http://www.nig.ac.jp/section/emoto/emoto-e.html



Neuromuscular junctions labeled by tagging a synaptic protein with GFP

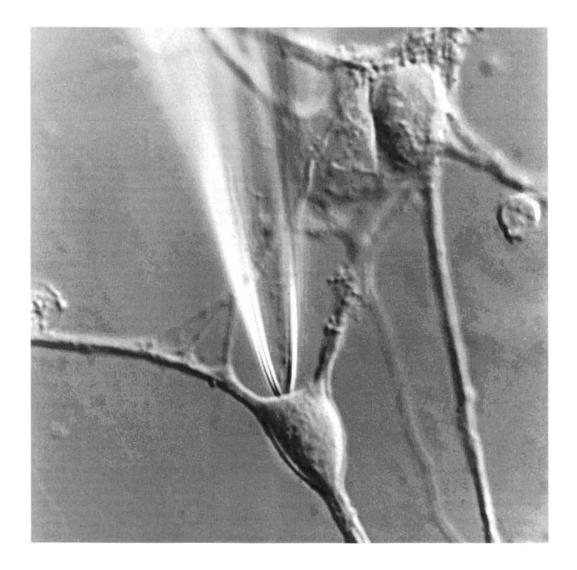
http://thalamus.wustl.edu/nonetlab/ResearchF/elegans.html

#### Simultaneous intracellular and extracellular recording!



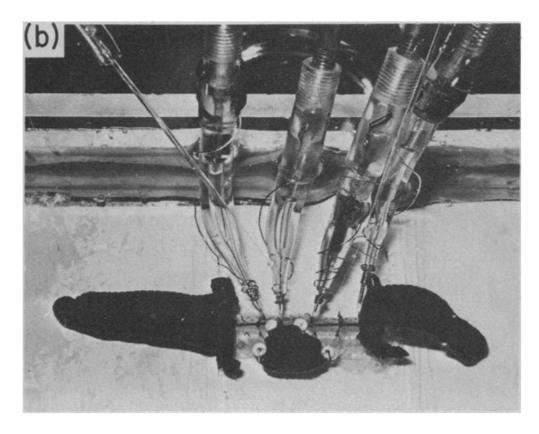
Henze et al. (J Neurophyiol, 2000)

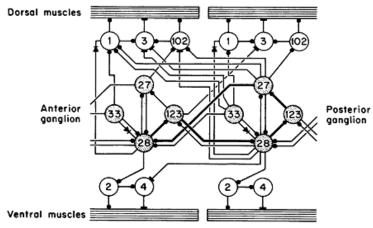
## Patch-clamp recording



Neher (*Sci Am*, 1992)

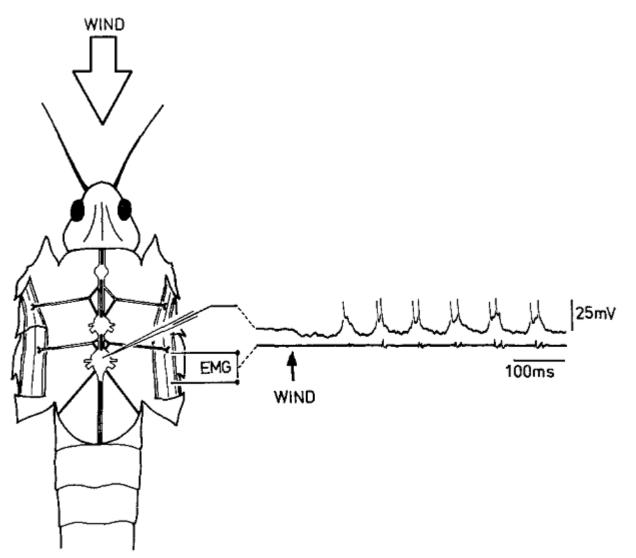
### "Semi-intact" preparation



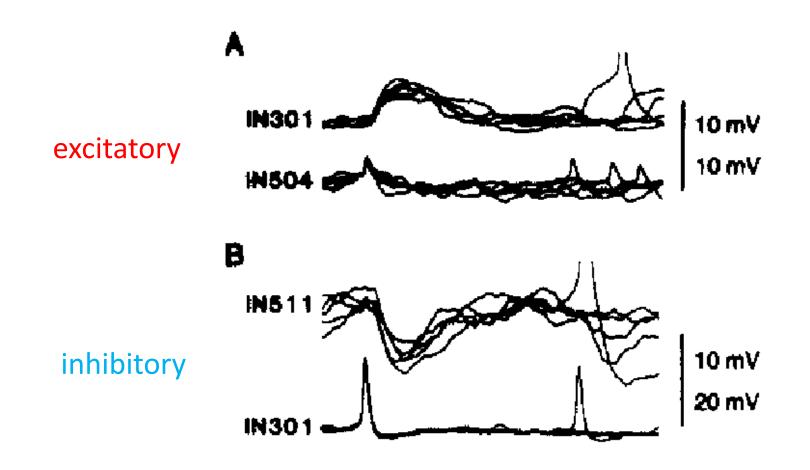


Leech swimming circuit (Stent et al., Science, 1978)

#### Intracellular recording during fictive behavior

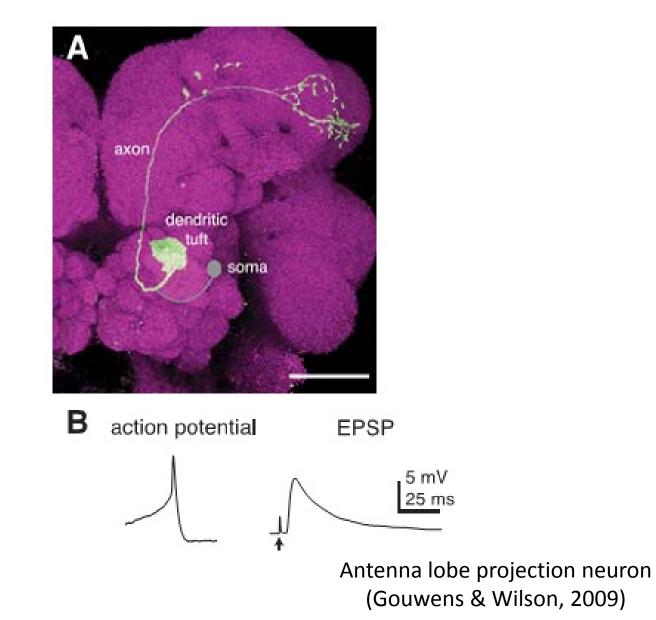


#### **Paired recordings in locusts**

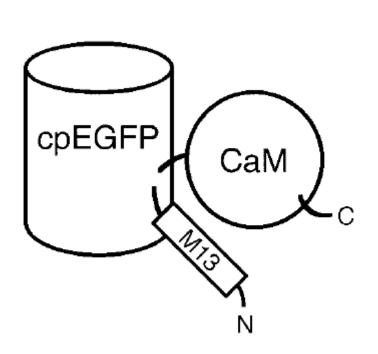


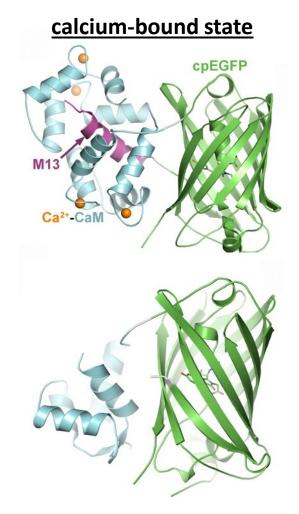
Robertson (Trends Neurosci, 1996)

### **Combining genetics with electrophysiology**



# GCaMP: A fluorescent indicator of neural activity via calcium levels





calcium-free state

http://en.wikipedia.org/wiki/GCaMP