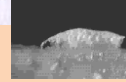


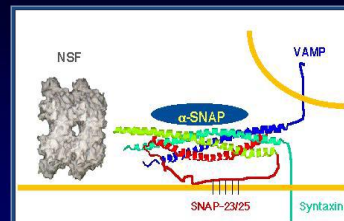
Synaptic transmission

- Quantal analysis
- Indexing synaptic transmission (a number)

The neuromuscular junction

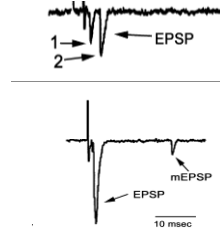


SNARE Hypothesis



- NSF
- SNAPs
 - Syntaxins
 - SNAP-25/23
- v-SNAREs
 - VAMP/brevins

Whiteboard work- NMI history of quantal synaptic transmission. Katz 1954.



$$\text{Mean quantal content} = \frac{\sum (\# \text{ of failures})(0) + (\# \text{ of singles})(1) + (\# \text{ of doubles})(2) \dots}{\text{Total number of stimulus trials}}$$

$$\text{Mean quantal content} = \frac{\text{Mean amplitude (or area) of evoked quantal events}}{\text{Mean amplitude (or area) of spontaneous quantal events}}$$

Minis

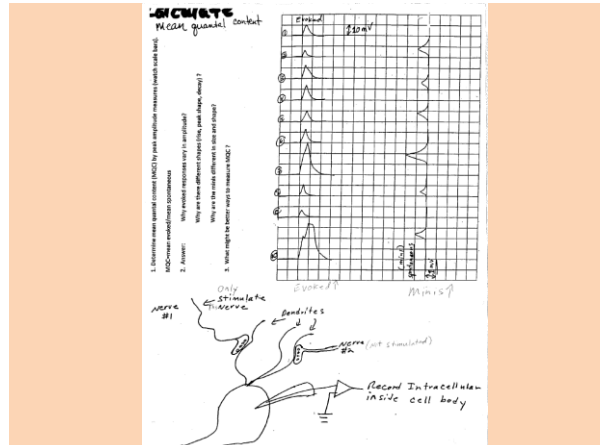
- Some evidence for distinct differences from evoked and spontaneous release pools.

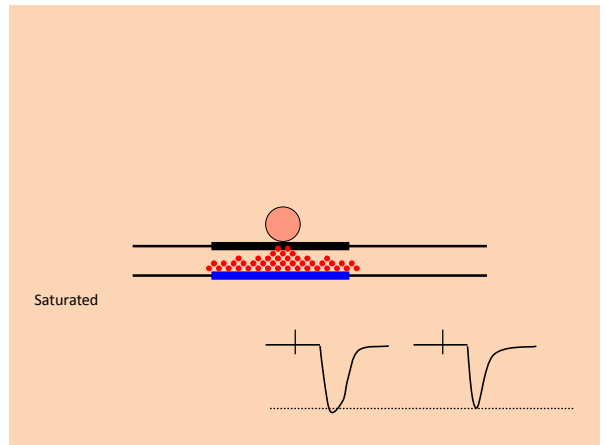
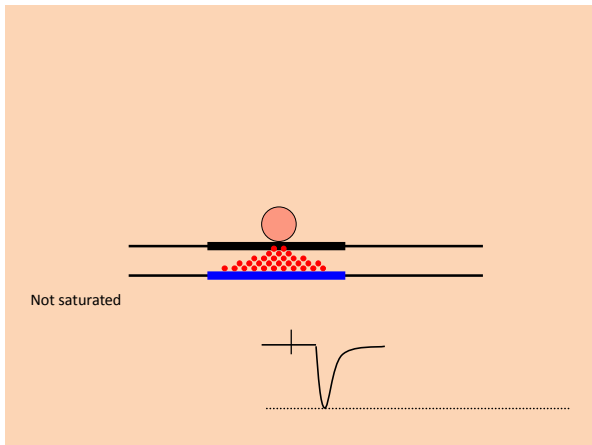
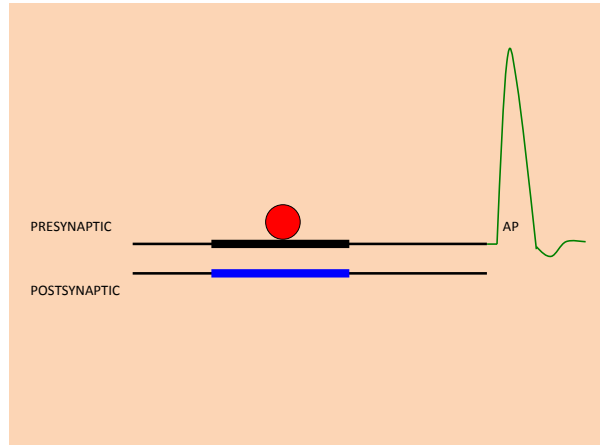
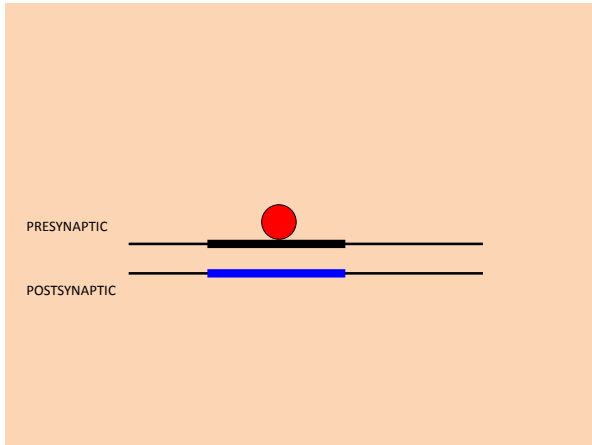
Chung et al. 2010 - hippocampal GABAergic inhibitory synapses.

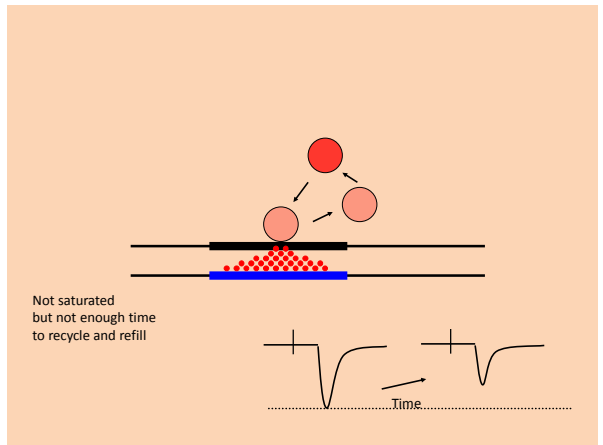
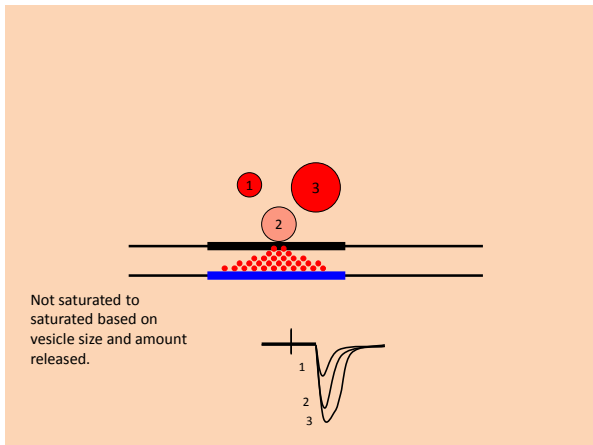
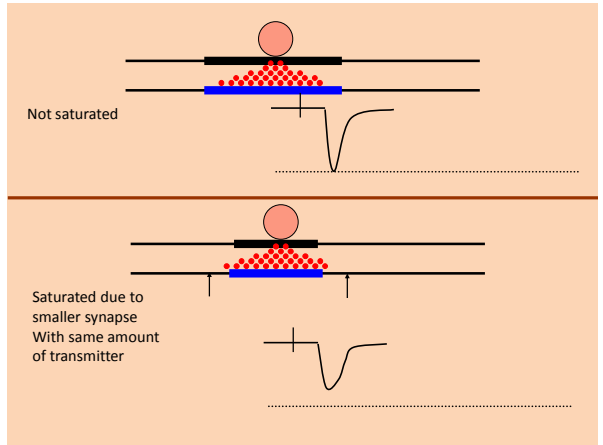
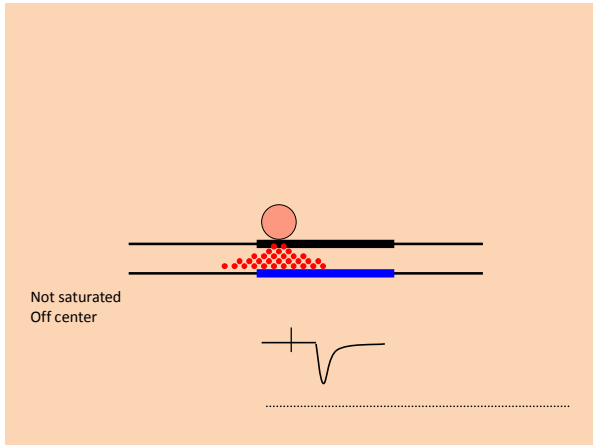
Fredj & Burrone, 2009 - rat hippocampal neurons.

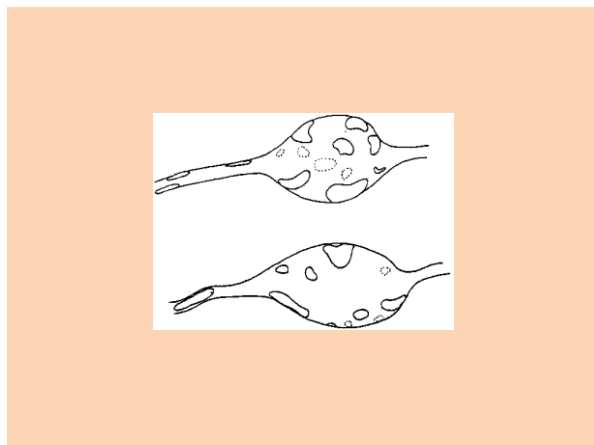
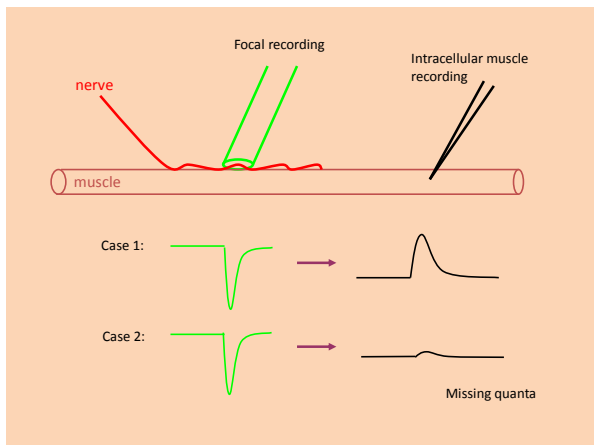
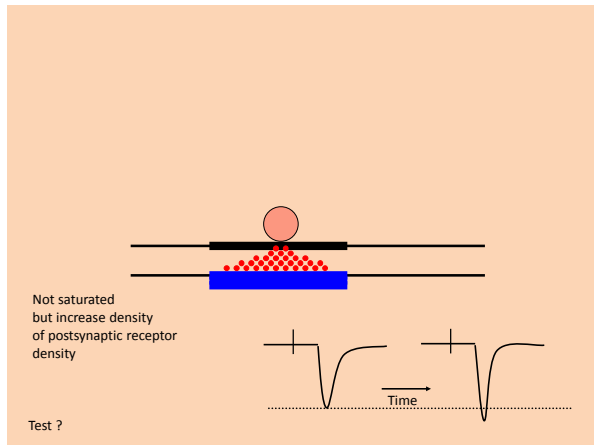
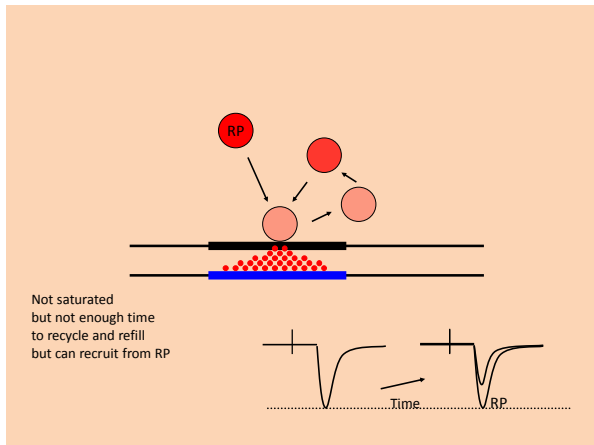
Sara et al., 2005 - rat hippocampal neurons.

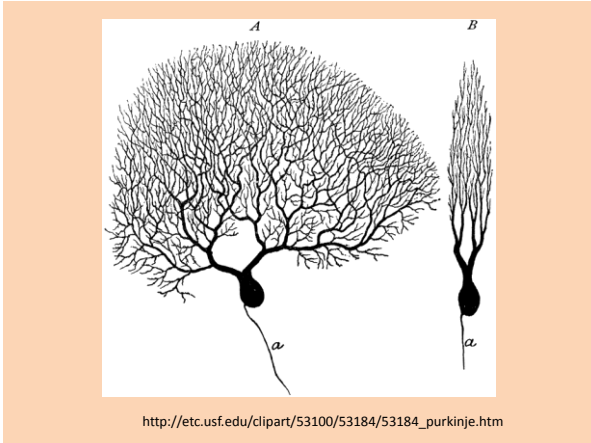
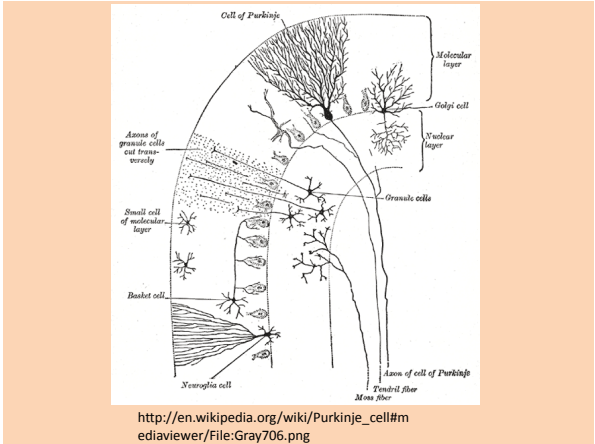
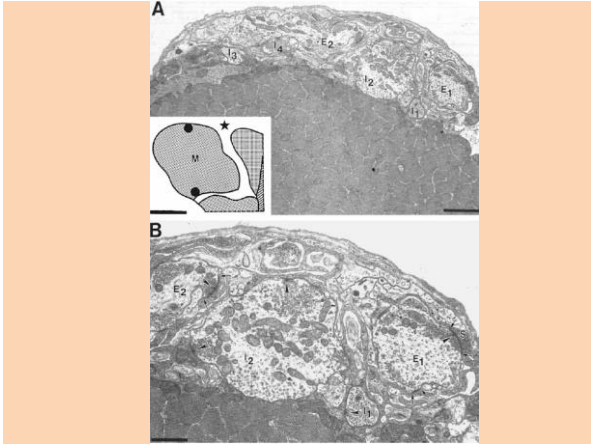
Controversial (Wilhelm et al., 2010 ... same pool)







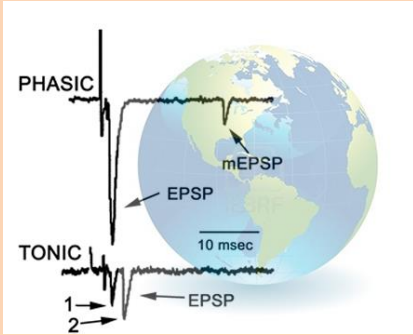




Classical Quantal Counting Methods vs. New Stochastic Measurements.

- More accurately measure n (number of docked sites) and p (probability of fusion at a site).
- Find subsets of quantal events.

Citizen science with high school students and adults from around the world participating in analysis of synaptic transmission



<http://web.as.uky.edu/Biology/faculty/cooper/Citizen%20Science%20folder/CitizenScienceProjectPage.htm>