

Abstract Submitted
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Synaptic vesicle dynamics in Hippocampal Slices KRASTAN BLAGOEV, National Science Foundation, DENIS BRAGIN, WOLFGANG MUELLER, University of New Mexico — Synaptic vesicle pool dynamics in hippocampal slices have been observed using FM-dye as an activity-dependent contrast agent with two-photon microscopy. Separate vesicle pools for spontaneous and stimulated vesicle release and their dynamics, and vesicle exchange dynamics between the pools was inferred from the signal with and without stimulation. To interpret the experimental results we developed a multi-compartmental kinetic model of the FM-dye dynamics during loading and unloading of vesicles. Using this mathematical model we estimated the exchange rates between the synaptic vesicle pools and the resulting vesicle release dynamics. We will discuss important differences between the vesicle pool dynamics in ex-vivo brain slices and in disassociated neuronal cultures.

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