Real time measurements of Exo and Endocytosis in SMA mouse model expressing SypHy

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In our laboratory we generated a new line of transgenic mice expressing synaptophysin and pHluorin (SypHy) as a fusion protein, in a SMA mouse model. This tool allowed us to study synaptic vesicle recycling in motor nerve terminals in real time by monitoring the fluorescence changes taking place during exocytosis and endocytosis.
In the Smnko/ko-SypHy transgenic mouse, electrical stimulation of the axons that innervate the TVA muscle produced a fluorescence increase in nerve terminals due to the fusion of SVs with the plasma membrane and the exposure of pHluorin to the extracellular pH (7.4). Following stimulation, fluorescence returned to resting levels as vesicles were endocytosed and reacidified. We studied the time course of fluorescence decay in the SMA-SypHy transgenic mouse line.
We calculated both t1/2 and t1/e values of the mean fluorescence responses in WT and SMA mutant mice expressing SypHy and found that there was no significance difference between these phenotype. This result suggest that endocytosis is not impaired in SMA mutant mice as the contrary to recently found