I want to understand how presynaptic calcium signals are assigned to the regulation of different fundamental presynaptic functions, such as synaptic vesicle (SV) release, recycling, replenishment, as well as use-dependent and homeostatic plasticity. At current, my focus is on the protein Synaptotagmin 7 (Syt7). As a high affinity but slow calcium sensor Syt7 is thought to partake in SV replenishment of the readily releasable pool, short term facilitation as well as asynchronous release, but the precise mechanisms by which Syt7 regulates these processes remain debated. By employing imaging techniques and electrophysiological approaches, like two electrode voltage clamp, I aim to first verify the involvement of Syt7 in those processes at the Drosophila larval neuromuscular junction to then combine physiology with the Drosophila genetic toolkit to unravel the underlying molecular mechanisms.

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