Laboratory

Our lab is interested in the basic mechanisms of synaptic regulation. We are focused in the study of the organization of active zones in relation to synaptic transmission. We investigate the dynamics of quanta release and replenishment in a mature synapse, the NMJ, and the spatial localization of active release sites as a function of synaptic activity.

For the study of synaptic function and dysfunction we combine molecular, electrophysiological and optical tools and use genetic mouse models. Dynamic optical techniques allow the monitoring of exocytosis and endocytosis in real time. We use synaptopHuorin and synaptophysin-pHlourin transgenic mice with this purpose.

These techniques also allow to get a spatial view of neurotransmission in large synapses with hundreds of release sites.

We are also very interested in the involvement of synapses in neurological diseases, such as in Spinal Muscular Atrophy, which is the most frequent genetic cause of childhood lethality, and is caused by homozygous loss or mutation of the SMN1 gene on human chromosome 5, which codes for the Survival Motor Neuron (SMN) protein.