

What can we learn from pretzels?

The Molecular Machinery for Synaptic Remodelling

Laboratory of Synaptogenesis, Dept. of Cell Biology, Nencki Institute of Experimental Biology.

The neuromuscular junction (NMJ) in the mammalian skeletal muscle undergoes a postnatal topological transformation from a simple oval plaque to a complex branched structure. Disruptions of NMJ maturation and/or maintenance are frequently observed in neuromuscular disorders such as congenital myasthenic syndromes.

We previously demonstrated that podosomes, actin-rich adhesive organelles, promote postsynaptic machinery maturation in cultured myotubes. We now show that some of the typical podosome components are concentrated at sites of NMJ remodelling in vivo, which suggests a role of podosomes in synaptic organization. We identified Amotl2 as a candidate regulator of podosomes and NMJ development. Subsequently, we discovered that Amotl2 and the closely related protein Amotl1 are associated with synapses in the central nervous system. We are currently conducting biochemical and genetic experiments to dissect their function in the central and peripheral nervous systems.