

Looking for the origins of the synapse in the tangled history of SNARE protein complexes.

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SNARE proteins drive membrane fusion in eukaryotes. Their mode of action was originally worked out in synaptic vesicle mutants, but they are now known to act throughout the cell. These helical trans-membrane molecules can be identified by a distinct SNARE sequence motif, and act in tetrameric complexes: one helix is embedded in the vesicle and three in the target membrane. The zipping up of these helices provides the force for vesicle fusion. The same helix can participate at multiple membrane interfaces, but the full complex acting at any interface is unique. In this project we will use phylogenetic and protein sequence approaches study the evolution of combinatorial interactions between different SNARE subunits. This will shed light on how secretory synaptic vesicles are descended from more ancient cellular transport pathways.

References:

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