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### **Actin filaments in synaptic transmission and synaptogenesis**

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Actin filament is a major cytoskeleton in synapses and highly enriched in the presynaptic and postsynaptic compartments. Their roles in synaptic vesicle recycling and synaptogenesis have been extensively studied but functional evidence whether actin filaments are involved in these processes is as yet lacking. Dysfunction in synaptic vesicle recycling causes various diseases such as Alzheimer's disease, Schizophrenia, Bipolar disease, depression etc.

Early synatogenic contacts between presynaptic and postsynaptic cells are mediated by actin-based structures called filopodia. Initial contact is followed by the establishment of stable sites of cell-to-cell contact and subsequently, by pre and postsynaptic differentiation. During these processes, actin filament network is dynamically changed in direction of the new synapse formation. In the nervous system, the same basic mechanisms used in development tend to be reutilized in adulthood for plasticity. Thus, understanding the mechanism of synaptogenesis is not only important in early neuronal development but also important in synaptic plasticity during learning and memory process. In this presentation, I will review the present view as to actin dynamics in synaptic transmission and synaptogenesis.