Special Issue

The Molecular Mechanisms Underlying the Development and Function of the Synapse

Message from the Guest Editor

Synapses are fundamental structures that are required for neuronal information transmission and brain functions. Synaptic connections are formed with remarkable specificity. Presynaptic axons usually travel a long distance to target the postsynaptic neurons in specific subcellular compartments. Combining molecular, physiological, and genetic methods, researchers have identified many molecules involved in synaptic development and maintenance, including the cytoskeleton, scaffolding, trafficking, cell adhesion, and secreted signal molecules and receptors. However, many questions remain. For example, how do presynaptic neurons identify the postsynaptic neurons from diverse cell types? How is synaptic subcellular specificity determined? How are the synaptic proteins trafficked and docked at the correct sites? How are synaptic connections maintained throughout the lifetime, especially during growth and aging? What roles do non-neuronal cells such as glia play in the synaptic assembly? How does the synaptic structure affect neuronal function and behaviors? In this Special Issue, we will collect papers related to the mechanisms underlying synaptic development and functions.

Guest Editor

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