Multipartite molecular complexes shaping synaptic inhibition

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Synapses, the fundamental units of neural communication, are precisely organized by synaptic cell-adhesion molecules (CAMs). These molecules orchestrate the structural alignment of pre- and postsynaptic membranes and coordinate the assembly of their signaling machinery, which is crucial for dictating the identity and function of each synapse. Our laboratory investigates how specific interactions between pre- and postsynaptic CAMs and their associated signaling molecules create a molecular blueprint that governs the diversity of synapses. We hypothesize that this precise blueprint determines the number, location, and functional properties of individual synapses, thereby sculpting the intricate architecture of neural circuits. In this talk, I will present our recent findings on the multipartite molecular complexes that control transsynaptic inhibition. Our research reveals how these complexes function as key elements of the molecular blueprint, providing fundamental insights into the principles of neural circuit design and organization.