



CDB SEMINAR

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Monday, June 1, 2009

16:00~17:00 A7F Seminar Room

Extrinsic and Intrinsic regulators of synapse formation in *C. elegans*

Summary

Chemical synapses are specialized cellular junction structures that are essential for communication between neurons. During development, synapses form between specific neurons at defined subcellular compartments. Synaptic target selection, axonal transport and presynaptic assembly are integral steps of synapse formation that are poorly understood.

Synapses are usually formed on distal axon and dendrites, creating a challenging problem for effective exchange of intracellular material between cell bodies and synapses. Microtubules and MT associated motors mediate intracellular trafficking. It is generally believed that the direction of transport depends on two factors: the polarity of MTs and the type of motor involved. Based on our published and unpublished data, we have identified two cyclin-dependent kinase pathways that are essential for the trafficking of presynaptic components. In the absence of both pathways, the vast majority of synaptic vesicle proteins and active zone markers fail to localize to axon and instead are found in dendrites due to misregulation of kinesin motors. I will also present evidence that extrinsic signals including Wnt and Netrin modulate the distribution of presynapse by modulating the activity of these intracellular pathways.

■References ; Nature 2008 455:669-673. ,
Science 2007 318:103-106. ,
Cell 2007 130:704-716.

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