



CDB SEMINAR

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Thursday, April 21, 2011

16:00 - 17:00 A7F Seminar Room

How do cell-surface molecules specify synaptic-layer targeting in the visual system ?

Summary

Neuronal connections are often organized in layers that contain synapses between neurons that have similar functions. In *Drosophila*, R7 and R8 photoreceptors, which detect different wavelengths, form synapses in distinct medulla layers. The mechanisms underlying the specificity of synaptic-layer selection remain unclear. We found that Golden Goal (Gogo) and Flamingo (Fmi), two cell-surface proteins involved in photoreceptor targeting, functionally interact in R8 photoreceptor axons. Our results indicate that Gogo promotes R8 photoreceptor axon adhesion to the temporary layer M1, whereas Gogo and Fmi collaborate to mediate axon targeting to the final layer M3. Structure-function analysis suggested that Gogo and Fmi interact with intracellular components through the Gogo cytoplasmic domain and that the phosphorylation of the tyrosine residues in the cytoplasmic domain is critical for Gogo function. Moreover, Fmi was also required in target cells for R8 photoreceptor axon targeting. We propose that Gogo acts as a functional partner of Fmi for R8 photoreceptor axon targeting and that the dynamic regulation of their interaction specifies synaptic-layer selection of photoreceptors. We will discuss the broad implication of this molecular mechanisms, and how it might explain the general principles of synaptic-layer selection of axons.

Reference

Hakeda-Suzuki S, Berger-Mueller S, Usui T, Horiuchi S, Uemura T, Suzuki T. Golden Goal Collaborates with Flamingo in Conferring Synaptic-Layer Specificity in the Visual System. *Nature Neuroscience* 2011 Mar;14(3):314-23

lab home page

<http://www.neuro.mpg.de/english/junior/axguide/index.html>

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