

第43回埼玉大学脳科学セミナー

主催：埼玉大学脳科学融合研究センター

Somatotopic refinement via developing
synapse elimination in the whisker
sensory thalamus of developing mice

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場所：理工学研究科大学院国際セミナー室
(理工学研究科棟7階)

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要 旨

Synapse elimination and strengthening are critical steps for the developmental organization of neural circuit. Afferent synapses in the whisker sensory thalamus undergo developmental synapse elimination even after the whisker map called barreloid is established. However, the physiological meaning in the detail is unclear because what fiber is going to survive and what is not, is poorly characterized. Thus, we generate Krox20Cre:tdTomato transgenic mice in which whisker-related afferent (lemniscal) fibers are specifically labeled. Then, we studied the developmental synapse elimination of the lemniscal fibers in the somatosensory thalamus using the mice. Here we show that non-whisker-related lemniscal fibers were preferentially eliminated in the developing whisker sensory thalamus. Such preferential elimination was more prominent on dendrites than on soma of relay neurons, and was partially dependent on tactile sensory experience. Synaptic maturation coincided with this process, indicating selective strengthening of surviving afferent synapses. Our results imply one of the functional significances of the synapse elimination, refinement of somatotopic information in the developing sensory thalamus.