学位論文抄録

Function of draxin on hippocampal development
（　海馬発達におけるドラキシンの機能　）

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Abstract of the Thesis

Background and Purpose: Draxin is an axon guidance molecule that plays very important roles in the formation of spinal cord and all three major commissures of the forebrain (Islam et.al. Science 323, 388-393). Expression of draxin in hippocampus raises the possibility of draxin to play essential roles in formation of the hippocampus. This study was aimed to reveal the role of draxin in hippocampal formation.

Methods: To determine draxin expression pattern in hippocampus, section in situ hybridization and β-gal staining were used. Other methods used in this project were HE staining, Nissl staining, immunohistochemistry, and cell culture. Cell numbers were assessed by an unbiased stereological method using an optical fractionator. For cell proliferation assay, BrdU incorporation was used.

Results: Draxin is widely expressed by various cell types in the developing hippocampus. The size of the hippocampus was smaller in draxin knockout mice than in wild types, especially with respect to the rostral part. The total number of granule cells and pyramidal cells was decreased in draxin knockout mice. The fornix of hippocampus efferent system and mossy fibers was not normally formed in draxin knockout mice. BrdU staining revealed cell proliferatin is not decreased in draxin knockout mice and cell apoptosis is increased in draxin knockout mice.

Conclusions: Draxin is an axon guidance molecule and also plays critical roles in the formation of hippocampus.