

ASHBi SEMINAR

Brainstem Neural Circuits for Horizontal and Vertical Saccades and Their Triggering Mechanism

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Venue Conference Room **Onsite Only***
B1F, Faculty of Medicine Bldg. B

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Abstract

Saccades shift gaze to objects of interest in the visual field, moving their image to the central retina, where it is maintained for detailed examination (eye fixation). During such fixation, all eye movements to other targets which appear in the visual field are suppressed. We analyzed the neural circuits for generating horizontal and vertical saccades using intracellular recording (electrophysiology) and staining (anatomy) methods in anesthetized cats, and revealed that the output pathways from the superior colliculus (SC) to ocular motoneurons are composed of horizontal, upward-torsional and downward-torsional systems rather than the generally-believed horizontal and vertical systems. The upward-torsional system on one side is antagonistic to the downward-torsional system on the opposite side, and these systems are very similar to those of the well-known vestibuloocular reflex pathways, and therefore, we concluded that the saccade system uses 3D semicircular canal coordinates rather than 2D horizontal and vertical coordinates. Based on these findings, we recently identified the neural mechanisms for suppressing saccades during eye fixation and triggering saccades by eliminating the suppression, using the same methods. In this presentation, I'd like to discuss the neural mechanisms for triggering saccades, and the presumed common coordinate system in eye movement systems.

Organizer : Graduate School of Medicine
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