

ASHBi SEMINAR

The eyes are windows into the dreaming brain

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Time 16:00 – 17:00 [JST]

Venue Conference Room
(B1F, Faculty of Medicine Bldg. B)



*Register via the right QR code

Abstract

Since the discovery of REM sleep, the nature of the rapid eye movements that characterize this sleep phase has remained elusive. Do they reveal gaze shifts in the virtual world of dreams or simply reflect random brainstem activity? In a previous study, we harnessed the head direction (HD) system of the mouse thalamus, a neuronal population whose activity reports, in awake mice, their actual HD as they explore their environment and, in sleeping mice, their virtual HD. We discovered that the direction and amplitude of rapid eye movements during REM sleep reveal the direction and amplitude of the ongoing changes in virtual HD, i.e. virtual head turns.

What coordinates the direction of rapid eye movements with that of virtual head turns during REM sleep? We have tested the role of the superior colliculus (SC) because, in awake animals, the SC coordinates eye and head movements to generate gaze shifts. We have discovered that the SC activity can predict the direction of rapid eye movements and virtual head turns during REM sleep. Furthermore, we have also discovered that silencing the SC has a major impact on virtual head turns during REM sleep. These discoveries suggest that the SC, by orchestrating sensorimotor representation in the sleeping brain, may mediate gaze shifts in the virtual world of REM sleep.

Organizer : Graduate School of Medicine Institute for the Advanced Study of Human Biology (WPI-ASHBi)

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