

# ASHBi SEMINAR

## Sound activates a dormant visual-motor pathway bypassing the primary visual cortex

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Date Tuesday, 30 July 2024

Time 16:00 – 17:00 [JST]

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



\*Register via the right QR code

### Abstract

Like in other species, the primate visual system features multiple parallel processing streams, besides the geniculostriate pathway. However, the functionality of alternative visual pathways in primates remains unknown; some evidence might even suggest their potential dormancy. We first tested this by reversibly inactivating the primary visual cortex (V1) in two macaque monkeys and investigating a reflexive oculomotor phenomenon, called saccadic inhibition. This reflex, believed to rely on subcortical eye-movement control circuits (Buonocore and Hafed, 2023), is characterized by a short-latency cessation of saccades by visual stimuli, accompanied by a saccade direction biasing towards and then away from stimulus location. When we created a localized cortical scotoma, saccadic inhibition was abolished for stimuli in the blind field, confirming the importance of the geniculostriate pathway. Superior colliculus visual responses were also affected. However, why do alternative visual pathways, including direct retinotectal ones, exist at all? We hypothesized that such pathways might retain functionality, albeit in a gated manner. During V1 inactivation, pairing visual onsets in the scotoma with bilateral sound pulses restored saccadic inhibition. Most importantly, it revived saccade direction biasing towards the visual stimulus location, even though the sound itself was not spatially informative at all. These results demonstrate that multi-sensory stimulation can unmask latent visual signals present in seemingly dormant visual-motor pathways, and that these pathways are likely merely gated rather than fully dormant.

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