# AB072. Functional impact of the lateral posterior nucleus on the mouse primary visual cortex

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**Background:** Information about the visual world is processed by an ensemble of cortical visual areas, which follow a hierarchical organization. The primary visual cortex (V1) first receives most of this information through the lateral geniculate nucleus (LGN), before being conveyed to higher-order cortical areas. Aside from this connectional route, there is also a complex network of bilateral connections between areas of the visual cortex and the pulvinar, considered as the largest extrageniculate visual thalamic nucleus. Despite an increasing number of studies on pulvinar, the exact function of this thalamic complex remains unknown. In this study, we investigated the functional impact of the lateral posterior (LP) nucleus, the homologue of the primate pulvinar, on the activity of neurons in the primary visual cortex in mice using optogenetic stimulation.

**Methods:** A channel rhodopsin-2 gene-carrying viral vector (AAV5.CaMKII.hChR2-eYFP.WPRE) was injected into the LP of wild-type (C57BL/6) mice. Extracellular recordings of the activity of V1 neurons were carried out using 16- and 32-channel silicon probes. The stimulation of LP was achieved with light pulses (470 nm, 20 pulse trains of 5 ms each at 10 Hz) delivered by a 4-channel optrode, which also recorded the thalamic activity. Visual stimuli consisted on drifting sinewave gratings of varying parameters (direction, contrast, spatial or temporal frequency and size).

**Results:** Our preliminary data shows that LP stimulation performed in conjunction with the visual stimulation decreases the amplitude of neuronal responses up to 50%. To date, results indicate that this inhibitory effect is only observed in neurons in the infragranular layers. The response profiles of V1 neurons to size-increasing stimuli were also affected.

**Conclusions:** These findings suggest that the pulvinar nucleus can exert layer-dependent contextual modulation on the activity of neurons in the mouse primary visual cortex.

**Keywords:** Mouse; electrophysiology; pulvinar; primary visual cortex

doi: 10.21037/aes.2018.AB072

**Cite this abstract as:** Keysan U, Casanova C. Functional impact of the lateral posterior nucleus on the mouse primary visual cortex. Ann Eye Sci 2018;3:AB072.