



Life Sciences Seminar

The enigmatic ventrolateral geniculate nucleus (GLv): an operational hub involved in gaze control

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The GLv is a prominent retinal target in all amniotes. In birds, it is also in receipt of tectal and hyperpallial (Wulst) projections. The efferents follow a descending course through the hindbrain. Nevertheless, the whole connectivity is incomplete. Due to this and the lack of behavioral GLv-related experiments, the role of this nucleus in vision remains unclear. In order to tackle this problem, first we decided to unravel the entire connectivity of the GLv by means of intracellular filling and extracellular tracings in the chicken and pigeon, respectively. We characterized the morphology and projection pattern of all major GLv cells. The tracing data indicate that this nucleus is connected with telencephalic, diencephalic, mesencephalic, and metencephalic structures. Also, we show single cell anatomy of structures that are closely related with the GLv such as neurons from the optic tectum, pretectum, and the somatosensory ventromedial thalamus. Using in situ hybridization assays we confirmed that the GLv has a strong GABAergic neurochemical identity. Finally, we performed a set of GLv-microstimulation experiments that show specific locus dependent head movements in the pigeon. In summary, our results reveal that the GLv has a hub network organization that is connected with all main brain divisions. Furthermore, we suggest that this complex circuitry may be the structural basis that enables the generation/modulation of gaze control.

Thursday, October 12, 2017 11:00am - 12:00pm

Seminar Room, Lab Building East



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