

Connections of the lateral posterior thalamic nucleus related to directed attention and neglect in rats.

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The lateral posterior thalamic nucleus (LP) has connections with two cortical areas involved in directed attention and neglect: medial agranular (AGm) and posterior parietal (PPC) cortex. Based upon double labeling with retrograde fluorescent tracers, these projections arise from largely separate but adjacent groups of neurons in LP, with AGm receiving input from the more medial population. In addition, LP, AGm and PPC all project to the dorsocentral striatum (DCS), a nodal point in the circuitry for directed attention and neglect. Based upon results from iontophoretic injections into LP of the anterograde axonal tracer 10K BDA, the densest input to striatum originates from the far medial portion of medial LP. This is consistent with retrograde cell labeling in LP after injections of retrograde tracers into DCS. Preterminal axonal labeling is concentrated in dorsal peripheral regions of DCS as well as in central DCS. Terminal labeling, represented by axon varicosities, is organized in several discontinuous foci. In contrast, injections made in medial LP that do not affect its far medial part result in little or no terminal labeling in striatum, but axon fascicles are visible as are terminal fields in the cortex. Similar results were found for projections from the lateral part of LP. Injections in the lateral dorsal nucleus produced terminal labeling in the dorsal peripheral region of the DCS only, located more laterally than labeling originating from far medial LP. These findings suggest the hypothesis that the foci in DCS originating from far medial LP may interact with those from cortical area PPC defined by us previously. The present results also suggest various ways that LP may play a role in directed attention and neglect, perhaps similar to that of the pulvinar in primates.

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