

Comparative study of visual inter and intrahemispheric cortico-cortical connections in five native Chilean rodents

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Summary

Previous studies of the visual cortical organization in the rat and other rodent species have raised the possibility that the visual cortical plan in the rat is common to a large number of species within the order. We have tested this idea by comparing the visual plan in the rat to cortical subdivision schemes obtained from five native Chilean rodent species, including members of the Cricetidae family within the Miomorph group, as well as from the Octodontidae family within the Caviomorph group. Cortical subdivision schemes were inferred from the analysis of the patterns of callosal connections revealed following multiple injections of HRP contralaterally, as well as from ipsilateral cortico-cortical connections observed after small injections of horseradish peroxidase conjugated with wheat germ agglutinin (WGA-HRP) into striate cortex. As in the rat, callosal connections in the native rodents concentrate at the border between cytoarchitectonic areas 17 and 18a, and along the borders of discrete, sparsely callosal islands of cortex in lateral peristriate cortex. Furthermore, single injections of WGA-HRP into striate cortex produce multiple, separate fields of labeled cells and terminations in the cortex surrounding area 17. Together, our data supports the idea of a common plan of visual cortical organization among rodents by providing evidence that the visual cortex in the native species is subdivided into multiple visual areas in a manner that resembles the rat cortical plan.