

Abstract

The effect of prefrontal and posterior parietal lesion on behavior in behavioral tests of spatial cognition

In this thesis we examined the effect of prefrontal and posterior parietal cortex lesions on rat behavior.

Medial prefrontal cortex is involved in working memory, behavioral flexibility and coding of spatial goals. Rats were tested in carousel maze in room frame reversal task and consequently in arena frame task on dark arena.

We observed, that the lesion of medial prefrontal cortex did not disrupt the reversal learning task, but the rats were impaired in initial learning of the task. No difference was found in arena frame task.

Posterior parietal cortex has a role in attention processes and takes part in processing spatial information and long term memory.

Rats with bilateral lesion of posterior parietal cortex were tested in battery of tests on carousel maze (reversal learning, double avoidance) and in Morris water maze (distal landmark version and modified version with intramaze landmarks).

Lesioned animals were impaired in carousel maze task in reversal learning of room frame representation. This effect was confirmed in double avoidance task, where lesioned animals had more entrances into room frame than the controls. In Morris water maze task, lesioned animals were impaired in intramaze landmark version.

Keywords: neocortex, posterior parietal cortex, prefrontal cortex, navigation, spatial orientation, carousel maze, Morris water maze, rat