
МАТЕРИАЛЫ КОНФЕРЕНЦИИ
И ШКОЛЫ

**RAT PREFRONTAL CORTEX NEURAL ACTIVITY AND DIFFERENT
DECISION-MAKING STRATEGIES**

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The activity of 145 neurons was recorded in the prefrontal cortex of the rat brain during the learning of the bilateral choice task in a two-ring maze. The animal chooses the right or left ring of the maze according to the conditional signals and gets reinforcement. The analysis of the 12 experimental sessions of the learning made it possible to distinguish three periods of analysis: the initial period, with a predominance of wrong trials, a turning point of the learning and a last period with a predominance of the percent of successful trials.

In each experimental series, the animal was tested in two different conditions of the behavioral program: with a delay in the beginning of each subsequent trials and without a delay. More successful execution was observed in delay conditions. Discriminant analysis made it possible to compare the activity of groups of neurons in 8 different behaviors: successful and wrong trials to the right and to the left ring of maze and with and without delay for each epoch of analysis. Initially, the animal was trained to run to the right ring and receive reinforcement;

in the process of learning, a new left side and a conditioned signals associated with it appeared.

It was found that at the beginning of the learning, the neuron activity significantly differs with wrong trials to the right ring, which is a discrepancy with the previously known behavioral model. At the next stage of learning, the activity associated with correct movements to the left becomes different from others, which apparently reflects the process of interiorization of a new left conditioned signal, and at the final stage of learning, the activity associated with a predominantly wrong choice is detected. In addition, in the learning process, there is a difference in activity with and without delay. It is assumed that in different epochs of the learning the animal uses different strategies of the choice and the revealed patterns of activity corresponding to one or another behavior are the reference for the animal in this period.

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