

МАТЕРИАЛЫ КОНФЕРЕНЦИИ
И ШКОЛЫ

AUTOMATION OF THE BEHAVIORAL TEST
“MORRIS WATER MAZE” ANALYSIS

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The “Morris Water Maze” (MWM) behavioral test is a universal method for testing cognitive functions in experimental rodents, and it is especially effective in detecting deviations in memory functions and learning. Despite the wide range of possible applications, data analysis makes the use of this test difficult. Currently, automated tracking and analysis programs of rodent moving are popular. But all known quality programs are the property of foreign commercial companies and are of high price. Thus, our goal was to develop and create an available quality blighty product, which will allow the scientist to carry out research using various options of the MWM. The result of the work is a software product that allows to quickly and accurately detect the trajectory of animal moving in the water, and also provides pa-

rameters for evaluating the cognitive functions of memory and learning.

As part of this work, software is developed that operates in several stages: preliminary processing of input data, data analysis and post-processing.

Currently, the output from the developed software is three files: a video file of analyzing test data (Fig. 1a, 1b), an image of the mouse’s path (Fig. 1b), measured metrics (platform search time, time spent in the quadrant with the platform and percentage time spent in the quadrant with the platform) (Fig. 1b). In the near future, it is planned to add the calculation of such metrics as: learning index, cumulative search error, Whishaw error, platform search strategy.

We have created a unique program, open and autonomous, for tracing mice and processing received data.

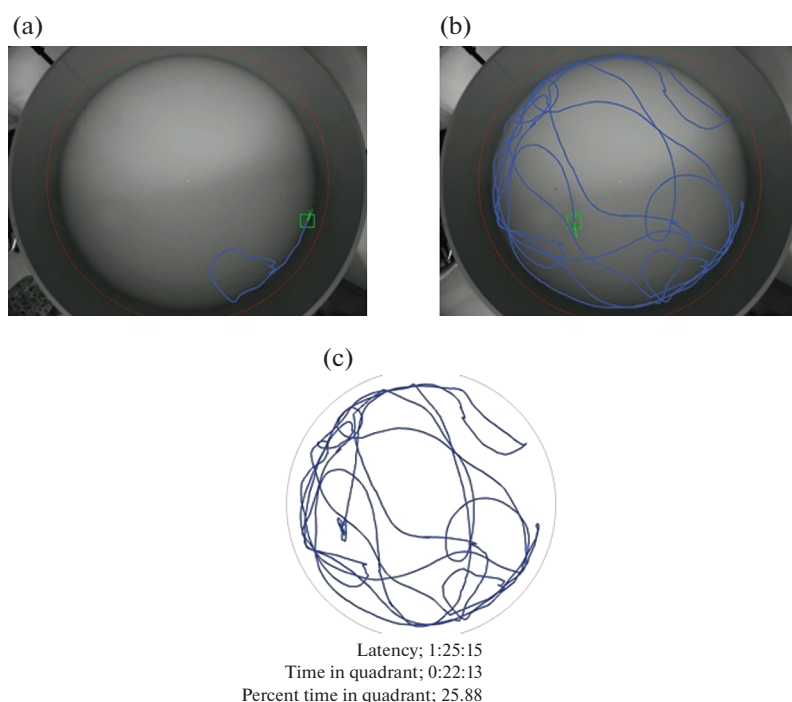


Fig. 1. The processing of “Morris Water Maze” test: (a) the beginning of processing, (b) the end of processing. (c) The path of movement of the tracked mouse and calculated metrics.

At the moment, our software is at the stage of active development, but it can already produce standard parameters. Since the software is self-sufficient, it does not require any massive third-party programs for its work, and will be effective for any modifications of MWM. In the future, after finalization, the created program will become an improved analogue of inaccessible commercial

programs. Accessibility, quality and versatility make the program we created an invaluable assistant to modern Russian scientists.

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