Light/dark transition test for mice

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ABSTRACT

Light/dark transition test is one of the most widely used tests to measure anxiety-like behavior of mice. Here, we present a movie that shows detailed procedures on how we conduct the test.

Protocol

The apparatus used for the light/dark transition test consisted of a cage (21×42×25 cm) divided into two sections of equal size by a partition with door (Ohara & Co., Tokyo). Mice are housed three to four per cage in a room with a 12 hr light/dark cycle (lights on at 7:00 A.M.) with ad libitum access to food and water. Ideally, two controls and two mutants are housed together, by re-organizing the mice as soon as they are genotyped at the time of weaning. Behavioral testing is performed between 9:00 A.M. and 6:00 P.M. All the cages containing mice are transferred to the behavior testing room 30 min before the first trial begins.

One chamber is brightly illuminated by white diodes (390 lux), whereas the other chamber is dark (2 lux). Mice are placed into the dark side and the door is opened automatically 3 seconds after the mouse is detected by the infrared camera. The door is used so that the mice do not enter the light chamber immediately after the release with their motivation to escape from experimenter, since the latency to enter the light chamber may serve as an index of anxiety-like behavior. They are allowed to move freely between the two chambers with door open for 10 min. The application used for acquiring and analyzing the behavioral data (Image LD4) is based on the public domain Image J program (developed by Wayne Rasband at the National Institute of Mental Health and available at http://rsb.info.nih.gov/ij/), which was modified by Tsuyoshi Miyakawa (available through O'Hara & Co., Tokyo, Japan). The distance traveled in each chamber, the total number of transitions, the time spent in the each chamber, and the latency to enter the light chamber are recorded by Image LD4 program. After each trial, all chambers are cleaned with super hypochlorous water to prevent a bias based on olfactory cues.

All procedures were approved by the Animal Use and Care Committee of Kyoto University.

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