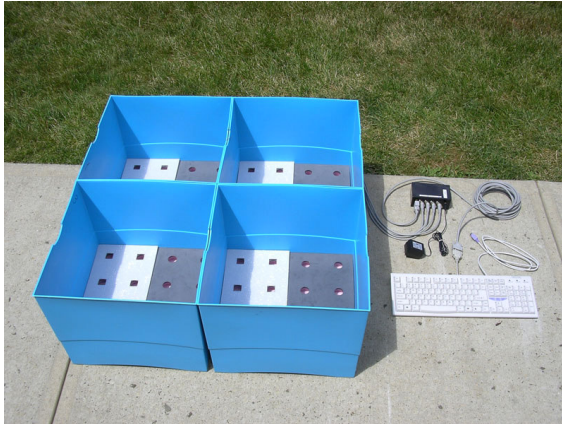*E v o l o c u s*

Equipment for Biomedical Research
Animal Behavior & Electrophysiology

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**Holeboard-based novel object recognition task**

This system can be used with any known protocol of novel object recognition task. Here mouse can discriminate between holes in the floor with different shape (round, square, 6-point star, *etc.*) and/or between different floor materials.

Technically, device is recording nosepoke activity with a help of infrared beams under the floor. Typical system consists of 4 independent chambers (about 16'' x 16'' each) and 4 mice can be tested simultaneously. Our equipment is compatible with any video-tracking system that can accept events from standard PC keyboard (*e.g.* Noldus EthoVision 3.0). We have also modification that can be used without any video-tracking.

Brief introduction into the history of Holeboard task

During the last 25 years Holeboard task has evolved from classic version with manual recording of mouse behavior towards modern computer-controlled system with infrared beams under the floor. Modern system can register duration of exploratory episodes to within 10 ms (using the same classic geometry with 16 holes (d = 25 mm) in the 40 × 40 cm arena, surrounded by vertical walls). In the classic Holeboard the single specific indicator of behavior was the number of nosepokes (for example, during 6-min session). In the modern setup it was discovered that two other indicators have better discriminative power: 1) "total exploration time" (this time is about 40-70 s for 6-min session) and, especially, 2) mean "nosepoke duration" (typical nosepoke duration is about 0.5-1.2 s). Contrary to straightforward logic, mean nosepoke duration can provide higher statistical significance than the number of nosepokes or total exploration time.

Our system was tested using C57BL/6J, DBA/2J and B6D2F1 female mice after standard and enriched housing conditions. Mice were taken from: Wolfer *et al.*, *Nature* **432**, 821-822 (2004). See the next page for results and the right photo for day 3 setup.
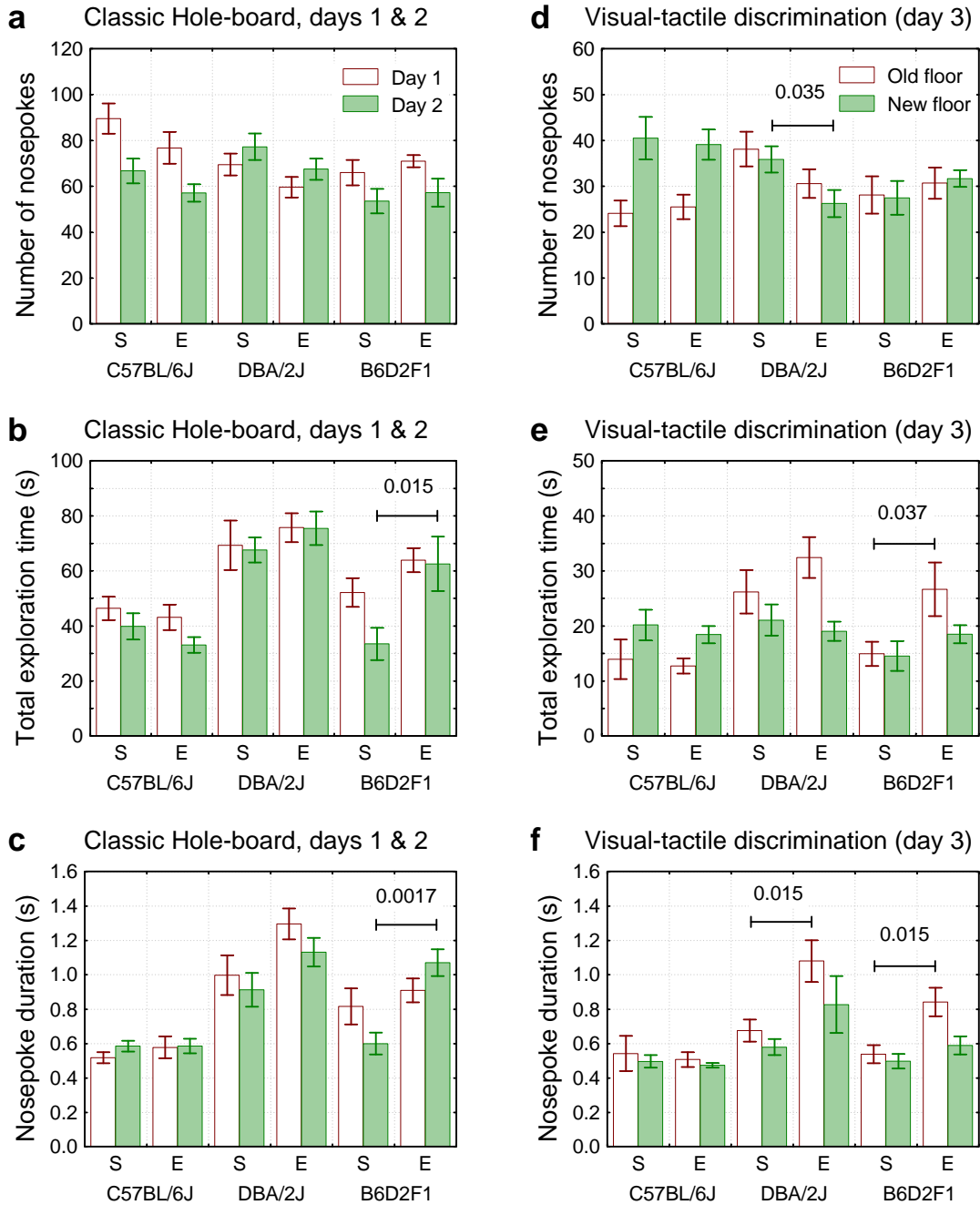
Visual-tactile discrimination of standard and enriched mice in the Hole-board task. **a-c**, Classic Hole-board, 6 min daily, days 1 & 2. **d-f**, Visual-tactile discrimination, 6 min (day 3). Number of nosepokes (**a**, **d**), total time of exploration (**b**, **e**) and averaged nosepoke duration (**c**, **f**). S, standard; E, enriched. Note the absence of enrichment effect in the number of nosepokes (**a**), and remarkable increase of nosepoke duration in the enriched hybrid B6D2F1 mice during the second day (**c**, green). Note the absence of enrichment effect in the exploration of new floor (**e-f**, green), but significant increase in nosepoke duration in the old floor in enriched DBA/2J and B6D2F1 (**f**, white). Mean ± SE. Mann-Whitney U-test (8 mice in each group).