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Open-field experiments from Alcacer et al 2024

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We use this protocol and it's working

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Abstract

Open field experimental set up and protocol for Alcacer et al 2024.

Guidelines

The inertial sensor should be secured to a connector or holder placed on the back of the microendoscope with a consistent alignment of its axes. If there is a different alignment and axes used, there may need to be corrections made in pre-processing before subsequent data analyses.

Materials

- white open-field arena (40 cm X 40 cm) with transparent acrylic bottom and side placed inside a sound-attenuating chamber.
- Video camera (Flea3, Point Grey Research) placed at the bottom of the arena recording at 30-40 frames per second (fps)
- Wireless inertial measurement unit (IMU), Champalimaud Hardware 22 Platform; WEAR motion sensor system - <https://www.cf-hw.org/harp/wear>
- Microendoscope (Inscopix)

Head-mount Habituation

- 1 Before starting experiments, habituate each mouse for 1 hour per day for 2-3 days to the head-mount equipment.
- 2 Mouse is lightly anesthetized with isoflurane to facilitate mounting of the equipment.
- 3 Attach a replica of the microendoscope that is the same weight as the real one (2g) and the actual wireless inertial sensor (1.8g).
- 4 Allow mouse to wake from the anesthesia.
- 5 Monitor mouse while it habituates to the equipment for 1 hour.
- 6 Lightly anesthetized with isoflurane to facilitate removing the equipment.
- 7 Recover mouse in its home cage and repeat for a total of 2-3 days.

Experimental day

- 8 Mouse is lightly anesthetized with isoflurane to facilitate mounting of the equipment.
- 9 Attach the microendoscope (2g) and the wireless inertial sensor (1.8g).
- 10 Place mouse in the open field box.
- 11 Wait 15 minutes after mouse has recovered from the anesthesia before starting the experiment/recording.
- 12 Begin simultaneous video recording, striatal activity recording and acceleration monitoring. **Note: the microendoscope and IMU are left in place all the session, that is,**





during the baseline recording, the 20 min waiting period and the 10 min recording after LD/VEH.

- 13 Baseline recording was taken for 10 minutes.
- 14 Remove mouse from open field arena and inject i.p. with L-DOPA or vehicle (see doi: xxx).
- 15 Place mouse in a cage next to the arena and allow for a 20 minute waiting period for treatment to take effect.
- 16 Place mouse back in the open field arena and record/image for another 10 minutes.
- 17 Stop recording and remove mouse from open field arena.
- 18 Lightly anesthetized with isoflurane to facilitate removing the equipment.
- 19 Recover mouse in its home cage and repeat for up to 3-4 days.