

LAB_072 Open Field Test for Rodents (Expiry: March 2026)

I. OBJECTIVE

To describe the procedure for measuring locomotor and exploratory behaviour of rodents in an open field arena.

NB: The use of (*) indicates this statement is dependent on the facility procedures

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II. COMMENTS / RECOMMENDATIONS

- Behavioural assessments are ideally performed in a dedicated behavioural suite.
- The environment should be free from uncontrolled external stimuli that may influence the animal's behaviour such as human traffic, unnecessary noise, intense lighting. Similarly, it is important that assessments are controlled for those stimuli which cannot be removed, such as time of day and light or dark phase.
- Male and female rodents should be tested separately, with one sex in the room at a time. Where possible males should be tested first, preferably on separate days but with at least thorough cleaning between the sexes. This is unless rodents are already housed within wire top cages or equivalent and both sexes are present in the home room.

III. EQUIPMENT

- PPE*

Minimum PPE is gloves and gown, additional PPE may be required based on facility or additional risk e.g. working with infectious animals.

- Appropriate trolley for transporting cages.
- Disinfectant* and paper towel for cleaning equipment.
- Arena – the open field can consist of any square or circle box, ideally within the ranges specified in the table below.

Arena dimensions	Mouse	Rats
Height (cm)	30	50
Minimum width/diameter (cm)	30	60
Maximum width/diameter (cm)	50	120

- Video recording equipment connected to a computer for video capturing and use of tracking software OR use of automated activity monitors where infrared beam breaks are used to measure animal movement.

To facilitate automatic tracking with video recording equipment, use diffuse lighting to minimise reflections.

- A curtain or screened off area for experimenter to be hidden from the rodents during testing, if available.

IV. PREPARATION

1. Check AEC approvals** to ensure that the correct procedure and personnel are approved for the planned work.

Conditions:

- Investigators named in an animal ethics application, relative to this SOP, must be competent to implement the SOP
- Any variation to this SOP must be described in the relevant animal ethics application
- If this SOP has not been reviewed and approved by a UQ AEC within the last three years it is no longer valid and cannot be used in animal ethics applications until reapproved (see "AEC Reviewed/Approved" date in this document's header).

2. Prepare equipment items including disinfecting prior to first use.
3. Bring rodents into the room (with lighting levels pre-set at the level required for the experiment) for at least 30 mins prior to start of experiment.

Length of habituation time in the testing room should be consistent for all rodents within an experiment.

V. PROCEDURE

1. Record light levels in the middle of the arena, for reproducibility and consistency.
Lux range should be between 30-100 LUX and should remain the same for all rodents within an experiment.
2. Start recording and identify subject/s within the camera view or set up activity monitor to start recording once presence of rodent is detected.
3. Handling of rodents as per: [LAB_006 Handling and Restraint in Mice and Neonates](#)
[LAB_039 Handling and Restraint in Rats and Neonates](#)
4. Place rodent either in the centre of the arena or in one corner of the arena.
Dependent on the requirement for anxiety measures such as 'latency to enter centre of the arena'.
5. Trials last anywhere from 6 minutes to 3 hours (when effects of drugs are being tested on locomotion)**.
6. At the end of the trial, remove the rodent and return them to the home cage.
Ensure immediate access to food and water, particularly for longer trials.
7. Stop recording and make sure to save the video file or activity monitor output.
8. Remove scat and thoroughly disinfect the arena and allow to dry completely.
9. Analysis can be made manually, using animal tracking software, or output from the beam breaks in the activity monitors.
10. This procedure can be repeated on consecutive days.

VI. ANALYSIS

A number of different parameters can be analysed using an open field arena or activity monitor. These include:

- Distance travelled and speed of travel
- Time spent in different parts of the arena (e.g edges versus centre)
- Rearing behaviour
- Body rotations
- Number of scat

VII. REFERENCES

1. Seibenhener ML, Wooten MC. Use of the Open Field Maze to measure locomotor and anxiety-like behavior in mice. *J Vis Exp*. 2015;(96):e52434, doi:10.3791/52434.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4354627/>
2. Tatem KS, Quinn JL, Phadke A, Yu Q, Gordish-Dressman H, Nagaraju K. Behavioral and Locomotor Measurements Using an Open Field Activity Monitoring System for Skeletal Muscle Diseases. *J Vis Exp*. 2014; (91):e51785, doi:10.3791/51785. <https://www.jove.com/t/51785/behavioral-locomotor-measurements-using-an-open-field-activity>

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