Open Field IMPC_OFD_001

Purpose

The Open Field test is used to assess anxiety and exploratory behaviors. It is based on the natural tendency of an animal to explore and to protect itself using avoidance which translates to a normal animal spending more time in the periphery of the Open Field arena than in the center (the most anxiogenic area).

Experimental Design

- **Minimum number of animals :** 7M + 7F
- **Age at test:** Week 9
- **Sex:** We would expect the results of this test to show sexual dimorphism

Procedure

1. Animals are transported to the testing room (or ideally an antechamber) and left undisturbed for 30 minutes before the test.
2. Ensure that lighting conditions are as desired (150-200 lux) and that all equipment is working correctly:

1. If using a beam break system, ensure that beams are not interrupted before putting the mouse and if measuring vertical activity (rears), check that height of the infrared frame for rears is correctly set.
2. If using a videotracking system, set detection parameters appropriate for the coat color of the mice.
3. For analysis, each openfield arena is divided into a peripheral zone measuring 8 cm from the edge of the arena walls, and a central zone around 40% of the total surface of the arena.

3. Testing is conducted during the light phase of the cycle with 1 hour gap from the light/dark change. Testing should be conducted during the same period of day.
4. Wipe the apparatus clean and allow time for it to dry
5. Each mouse is placed in the middle of a peripheral zone of the arena facing the wall and allowed to explore freely the apparatus, with the experimenter out of the animal's sight.

If more than one mouse can be tested in parallel, in adjacent open field arenas and mice are video-tracked, it is important to ensure that the tracking of each mouse starts as soon as the mouse is released to make data comparable.

Males and females must be run in separate tests; ideally males are tested first, then followed by females

6. At the end of the 20 min run, animals are labeled (if necessary) and put back into their home cage.
7. After each run, any feces are removed and the arena is thoroughly wiped.
8. Analysis of the recording is done to measure the activity of each mouse in each of the zones per 5 minute bins.

Notes

1. Please ensure that the mice are not handled prior to the test, except handling for cage change.
2. Ear clipping should be done after the test if necessary .

Data QC

1. Verify total time of run.
2. Coherence between latency, number of entries and time in the center; e.g. it is not possible to have zero entries and have spent some time spent in the center.

Parameters and Metadata

Distance travelled IMPC_OFD_005_001 | v1.2

seriesParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** true

Unit Measured: cm

Description: distance_travelled

Increments: 5, 10, 15, 20,

Number of Rears IMPC_OFD_006_001 | v1.1

seriesParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Description: number_of_rears

Increments: 5, 10, 15, 20,

Whole arena resting time IMPC_OFD_007_001 | v1.1

simpleParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** true

Unit Measured: s

Description: whole_arena_resting_time

Whole arena permanence IMPC_OFD_008_001 | v1.1

simpleParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** false

Unit Measured: s

Description: whole_arena_permanence

Whole arena average speed IMPC_OFD_009_001 | v1.1

simpleParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** true

Unit Measured: cm/s

Description: whole_arena_average_speed

Periphery distance travelled IMPC_OFD_010_001 | v1.1

simpleParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** true

Unit Measured: cm

Description: periphery_distance_travelled

Periphery resting time IMPC_OFD_011_001 | v1.1

simpleParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** true

Unit Measured: s

Description: periphery_resting_time

Periphery permanence time IMPC_OFD_012_001 | v1.1

simpleParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** true

Unit Measured: s

Description: periphery_permanence_time

Periphery average speed IMPC_OFD_013_001 | v1.1

simpleParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** true

Unit Measured: cm/s

Description: periphery_average_speed

Center distance travelled IMPC_OFD_014_001 | v1.1

simpleParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** true

Unit Measured: cm

Description: center_distance_travelled

Center resting time IMPC_OFD_015_001 | v1.1

simpleParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** true

Unit Measured: s

Description: center_resting_time

Center permanence time IMPC_OFD_016_001 | v1.1

simpleParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** true

Unit Measured: s

Description: center_permanence_time

Center average speed IMPC_OFD_017_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** true

Unit Measured: cm/s

Description: center_average_speed

Latency to center entry IMPC_OFD_018_001 | v1.1

simpleParameter

Req. Analysis: false **Req. Upload:** true **Is Annotated:** true

Unit Measured: s

Description: latency_to_center_entry

Number of center entries IMPC_OFD_019_001 | v1.1

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Description: number_of_center_entries

Distance travelled - total IMPC_OFD_020_001 | v1.2

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: cm

Description: distance_travelled_total

Derivation: sumOfIncrements('IMPC_OFD_005_001', 4)

Number of rears - total IMPC_OFD_021_001 | v1.3

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Description: number_of_rears_total

Derivation: sumOfIncrements('IMPC_OFD_006_001', 4)

Percentage center time IMPC_OFD_022_001 | v1.2

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: %

Description: percentage_center_time

Derivation: mul(div('IMPC_OFD_016_001', 'IMPC_OFD_008_001'), 100)

Equipment ID IMPC_OFD_023_001 | v1.0

procedureMetadata

Req. Analysis: false **Req. Upload:** true **Is Annotated:** false

Description: equipment_name

Equipment manufacturer IMPC_OFD_024_001 | v1.1

procedureMetadata

Req. Analysis: true **Req. Upload:** true **Is Annotated:** false

Description: equipment_manufacturer

Options: TSE Systems, MED Associates Inc, San Diego, O'hara CO Ltd., Panlab, Noldus, Accuscan, Columbus Instruments, Biobserve, Omnitech,

---

Equipment model IMPC_OFD_025_001 | v1.0

procedureMetadata

Req. Analysis: true **Req. Upload:** true **Is Annotated:** false

Description: equipment_model

Options: ActiMot / MoTil, MED-OFA-RS, 2325-0248, TijmeOF9, LE8822, Unknown, ActiMot / MoTil 480 x 480 mm, VMX 1.4b, Opto-Varimex 4, SuperFlex Fusion,

---

Central zone surface area IMPC_OFD_026_001 | v1.1

procedureMetadata

Req. Analysis: false **Req. Upload:** true **Is Annotated:** false

Unit Measured: % of total area

Description: central_zone_surface_area

Options: 40, 42, 41, 39,

Light intensity in the centre of the arena IMPC_OFD_027_001 | v1.1

procedureMetadata

Req. Analysis: false **Req. Upload:** true **Is Annotated:** false

Unit Measured: Lux

Description: light_intensity_in_the_centre_of_the_arena

Number of animals per cage IMPC_OFD_028_001 | v1.0

procedureMetadata

Req. Analysis: false **Req. Upload:** false **Is Annotated:** false

Description: number_of_animals_per_cage

Color of arena IMPC_OFD_029_001 | v1.0

procedureMetadata

Req. Analysis: false **Req. Upload:** false **Is Annotated:** false

Description: color_of_arena

Options: Black, Transparent, White, Grey,

Height of the wall IMPC_OFD_030_001 | v1.0

procedureMetadata

Req. Analysis: false **Req. Upload:** false **Is Annotated:** false

Unit Measured: cm

Description: height_of_the_wall

Distance from light source: if direct illumination IMPC_OFD_031_001 | v1.1

procedureMetadata

Req. Analysis: false **Req. Upload:** false **Is Annotated:** false

Unit Measured: cm

Description: distance_from_light_source_if_direct_illuminaton

---

Periphery zone IMPC_OFD_032_001 | v1.2

procedureMetadata

Req. Analysis: false **Req. Upload:** true **Is Annotated:** false

Unit Measured: cm

Description: periphery_zone

Options: 8, 7.6, 7.35, 9.39, 7.5, 7.9,

Type of analysis IMPC_OFD_033_001 | v1.1

procedureMetadata

Req. Analysis: true **Req. Upload:** true **Is Annotated:** false

Description: type_of_analysis

Options: Wide beam break, Video tracking,

Arena Size IMPC_OFD_034_001 | v1.0

procedureMetadata

Req. Analysis: false **Req. Upload:** true **Is Annotated:** false

Description: arena_size

Options: 45x45, 43.2x43.2, 40.5x40.5, 40x40, 44x44, 42x42, 44.5x44.5, 50x50,

---

Experimenter ID IMPC_OFD_035_001 | v1.1

procedureMetadata

Req. Analysis: false **Req. Upload:** true **Is Annotated:** false

Description: experimenter

Disinfectant IMPC_OFD_036_001 | v1.1

procedureMetadata

Req. Analysis: false **Req. Upload:** false **Is Annotated:** false

Description: disinfectant

Start Time IMPC_OFD_037_001 | v1.1

procedureMetadata

Req. Analysis: false **Req. Upload:** false **Is Annotated:** false

Description: start_time

Arena ID IMPC_OFD_038_001 | v1.0

procedureMetadata

Req. Analysis: false **Req. Upload:** false **Is Annotated:** false

Description: arena_id

Software Version IMPC_OFD_039_001 | v1.0

procedureMetadata

Req. Analysis: false **Req. Upload:** true **Is Annotated:** false

Description: software_version

Options: 06.15 / 07.01, Topscan Lite, Image OF, Actitrack system, Ethovision XT v8.5, Versamax 4.2, TSE ActiMot Vers. 08.00, Activity Monitor V6.02, Opto-Varimex 4 AutoTrack System 4.97, TimeOFCR4, Opto-Varimex AutoTrack 4.x, Opto-Varimex AutoTrack 5.x, Activity Monitor V7.0.5.10, Fusion v6.3, Ethovision XT v15,

---

Arena Material IMPC_OFD_040_001 | v1.0

procedureMetadata

Req. Analysis: false **Req. Upload:** false **Is Annotated:** false

Description: arena_material

Date equipment last calibrated IMPC_OFD_041_001 | v1.2

procedureMetadata

Req. Analysis: false **Req. Upload:** false **Is Annotated:** false

---

Whole arena resting time series IMPC_OFD_001_001 | v1.1

seriesParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: s

Increments: 5, 10, 15, 20,

Whole arena average speed series IMPC_OFD_002_001 | v1.2

seriesParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: cm/s

Increments: 20, 15, 10, 5,

Periphery distance travelled series IMPC_OFD_003_001 | v1.2

seriesParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: cm

Increments: 5, 10, 15, 20,

Periphery resting time series IMPC_OFD_004_001 | v1.2

seriesParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: s

Increments: 5, 10, 15, 20,

Periphery permanence time series IMPC_OFD_042_001 | v1.2

seriesParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: s

Increments: 5, 10, 15, 20,

Periphery average speed series IMPC_OFD_043_001 | v1.3

seriesParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: cm/s

Increments: 5, 10, 15, 20,

Center distance travelled series IMPC_OFD_044_001 | v1.3

seriesParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: cm

Increments: 5, 10, 15, 20,

Center resting time series IMPC_OFD_045_001 | v1.3

seriesParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: s

Increments: 5, 10, 15, 20,

Center permanence time series IMPC_OFD_046_001 | v1.2

seriesParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: s

Increments: 5, 10, 15, 20,

Center average speed series IMPC_OFD_047_001 | v1.2

seriesParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: cm/s

Increments: 5, 10, 15, 20,

Number of center entries series IMPC_OFD_048_001 | v1.1

seriesParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Increments: 5, 10, 15, 20,

Light beam barrier height (Z axis) IMPC_OFD_049_001 | v1.1

procedureMetadata

Req. Analysis: true **Req. Upload:** false **Is Annotated:** false

Unit Measured: cm

Description: height of the Z axis light beam used to determine when mouse is rearing

Options: 8.6, 6.8, 8.0, 7.5,

Percentage center movement time IMPC_OFD_050_001 | v1.0

simpleParameter

Req. Analysis: false **Req. Upload:** false **Is Annotated:** true

Unit Measured: %

Derivation:
mul(div(sub('IMPC_OFD_016_001', 'IMPC_OFD_015_001'),'IMPC_OFD_008_001'),100)

Resting definition threshold IMPC_OFD_051_001 | v1.0

procedureMetadata

Req. Analysis: false **Req. Upload:** false **Is Annotated:** false

Description: Parameter measuring how the equipment defines a 'resting' animal

Options: Stationary for > 1 second, Stationary for any time, Within grid for > 2 seconds,

---

Rearing definition threshold IMPC_OFD_052_001 | v1.0

procedureMetadata

Req. Analysis: false **Req. Upload:** false **Is Annotated:** false

Description: Parameter measuring how the equipment defines a 'rearing' animal

Options: No threshold, 1 second,