Open Field - centre start BCM_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

- **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

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

**Unit Measured:**

**Description:**

**Increments:**

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Description: number_of_rears
Increments: 5, 10, 15, 20,

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**Whole arena resting time** IMPC_OFD_007_001 | v1.1

*simpleParameter*

Unit Measured: s

**Description:** whole_arena_resting_time

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**Whole arena average speed** IMPC_OFD_009_001 | v1.1

*simpleParameter*

Unit Measured: cm/s

**Description:** whole_arena_average_speed

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**Periphery distance travelled** IMPC_OFD_010_001 | v1.1

*simpleParameter*
**Periphery permanence time** IMPC_OFD_012_001 | v1.1

simpleParameter

**Description:** periphery_distance_travelled

**Unit Measured:** cm

**Center distance travelled** IMPC_OFD_014_001 | v1.1

simpleParameter

**Description:** center_distance_travelled

**Unit Measured:** cm

**Center permanence time** IMPC_OFD_016_001 | v1.1
**Center permanence time**

- **Unit Measured:** s
- **Description:** center_permenence_time

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**Number of center entries** IMPC_OFD_019_001 | v1.1

- **Unit Measured:**
- **Description:** number_of_center_entries

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**Distance travelled - total** IMPC_OFD_020_001 | v1.2

- **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)

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**Percentage center time**  IMPC_OFD_022_001 | v1.2

*simpleParameter*

**Unit Measured:** %

**Description:** percentage_center_time

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

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**Equipment ID**  IMPC_OFD_023_001 | v1.0

*procedureMetadata*

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

**Description:** equipment_name

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**Equipment manufacturer** IMPC_OFD_024_001 | v1.1  
procedureMetadata

**Description:** equipment_manufacturer

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

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**Equipment model** IMPC_OFD_025_001 | v1.0  
procedureMetadata

**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,

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**Central zone surface area** IMPC_OFD_026_001 | v1.1  
procedureMetadata

**Unit Measured:** % of total area

**Description:** central_zone_surface_area
Light intensity in the centre of the arena IMPC_OFD_027_001 | v1.0

Procedure Metadata


Unit Measured: Lux

Description: light_intensity_in_the_centre_of_the_arena

Number of animals per cage IMPC_OFD_028_001 | v1.0

Procedure Metadata


Description: number_of_animals_per_cage

Color of arena IMPC_OFD_029_001 | v1.0

Procedure Metadata


Description: color_of_arena
**Height of the wall**  IMPC_OFD_030_001  |  v1.0

**Description:** height_of_the_wall

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

**Description:** distance_from_light_source_if_direct_illumination

**Periphery zone**  IMPC_OFD_032_001  |  v1.2
**Unit Measured:** cm

**Description:** periphery_zone

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

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**Type of analysis** IMPC_OFD_033_001 | v1.1

**Description:** type_of_analysis

**Options:** Wide beam break, Video tracking,

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**Arena Size** IMPC_OFD_034_001 | v1.0

**Description:** arena_size

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

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**Experimenter ID** IMPC_OFD_035_001 | v1.1
Disinfectant  IMPC_OFD_036_001 | v1.1
procedureMetadata

Start Time  IMPC_OFD_037_001 | v1.1
procedureMetadata

Arena ID  IMPC_OFD_038_001 | v1.0
procedureMetadata
Software Version  IMPC_OFD_039_001 | v1.0

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,

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Arena Material  IMPC_OFD_040_001 | v1.0

Description: arena_material

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Date equipment last calibrated  IMPC_OFD_041_001 | v1.2

Description:
Whole arena resting time series IMPC_OFD_001_001 | v1.1

Series Parameter


Unit Measured: s

Increments: 5, 10, 15, 20,

Whole arena average speed series IMPC_OFD_002_001 | v1.2

Series Parameter


Unit Measured: cm/s

Increments: 20, 15, 10, 5,

Periphery distance travelled series IMPC_OFD_003_001 | v1.2

Series Parameter


Unit Measured: cm

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

Series Parameter


Unit Measured: s

Increments: 5, 10, 15, 20,

**Center permanence time series** IMPC_OFD_046_001 | v1.2

Series Parameter


Unit Measured: s

Increments: 5, 10, 15, 20,

**Number of center entries series** IMPC_OFD_048_001 | v1.1

Series Parameter


Increments: 5, 10, 15, 20,
Light beam barrier height (Z axis)  

**Unit Measured:** cm  
**Description:** height of the Z axis light beam used to determine when mouse is rearing  
**Options:** 8.6, 6.8, 7.5,