

# 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,

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### 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,

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**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

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**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

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**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

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**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

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**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

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## 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

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## 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

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## 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

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**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

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**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

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**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

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## 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

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## 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)

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## 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

**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)

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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



**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,

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## 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, SuperFlex Environmental Control Chamber,

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## 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,

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## 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

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## 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

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## 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, White (floor)/Dark grey(walls),

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## 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

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## 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\_illumination

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## 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,

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**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,

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**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, 40.8x40.8,

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**Experimenter ID** IMPC\_OFD\_035\_001 | v1.1

procedureMetadata

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

**Description:** experimenter

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**Disinfectant** IMPC\_OFD\_036\_001 | v1.1

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Description:** disinfectant

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**Start Time** IMPC\_OFD\_037\_001 | v1.1

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Description:** start\_time

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**Arena ID** IMPC\_OFD\_038\_001 | v1.0

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Description:** arena\_id

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# 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, Viewer3, Opto-Varimex AutoTrack 4.x, Opto-Varimex AutoTrack 5.x, Activity Monitor V7.0.5.10, Fusion v6.3, Ethovision XT v15, TSE ActiMot Vers. 08.10, TSE ActiMot Vers. 08.12, Fusion v6.5,

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# Arena Material IMPC\_OFD\_040\_001 | v1.0

procedureMetadata

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

Description: arena\_material

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# Date equipment last calibrated IMPC\_OFD\_041\_001 | v1.2

procedureMetadata

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

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# 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,

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# 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,

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# 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,

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# Peripheral 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,

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# Peripheral 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,

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# Peripheral 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,

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**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,

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**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,

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**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,

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# 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,

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# 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,

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# 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, 2.54,

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## Percentage center movement time IMPC\_OFD\_050\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Unit Measured: %

Description: percentage\_center\_movement\_time

Derivation:

$\text{mul}(\text{div}(\text{sub}(\text{'IMPC\_OFD\_016\_001'}, \text{'IMPC\_OFD\_015\_001'}), \text{'IMPC\_OFD\_008\_001'}), 100)$

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## 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,

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## 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,

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