Open Field NINGLA_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 52
- **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

**Periphery zone** NINGLA_OFD_032_001 | v1.2

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

**Unit Measured:** cm

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

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**Arena Size** NINGLA_OFD_034_001 | v1.0

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

**Options:** 42x42, 45x45, 50x50, 44.5x44.5, 44x44, 40x40, 40.5x40.5, 43.2x43.2,
Whole arena average speed series NINGLA_OFD_002_001 | v1.2


Unit Measured: cm/s
Increments: 15, 10, 5, 20,

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Equipment model NINGLA_OFD_025_001 | v1.0


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

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Light beam barrier height (Z axis) NINGLA_OFD_049_001 | v1.1


Unit Measured: cm

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

Options: 6.8, 8.6, 8.0, 7.5,
**Height of the wall** NINGLA_OFD_030_001 | v1.0

procedureMetadata


Unit Measured: cm

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**Experimenter ID** NINGLA_OFD_035_001 | v1.1

procedureMetadata


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**Central zone surface area** NINGLA_OFD_026_001 | v1.1

procedureMetadata


Unit Measured: % of total area

Options: 41, 39, 42, 40,

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**Disinfectant** NINGLA_OFD_036_001 | v1.1
Periphery average speed NINGLA_OFD_013_001 | v1.1

Simple parameter

Unit Measured: cm/s

Distance travelled NINGLA_OFD_005_001 | v1.2

Series parameter

Unit Measured: cm

Increments: 10, 20, 5, 15,

Distance travelled - total NINGLA_OFD_020_001 | v1.2

Simple parameter

Unit Measured: cm

Increments: 10, 20, 5, 15,
Unit Measured: cm

Derivation: sumOfIncrements('NINGLA_OFD_005_001', 4)

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**Equipment manufacturer** NINGLA_OFD_024_001 | v1.1

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**Requirements:**
- Analysis: true
- Upload: true
- Annotated: false

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

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**Number of animals per cage** NINGLA_OFD_028_001 | v1.0

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**Requirements:**
- Analysis: false
- Upload: false
- Annotated: false

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**Type of analysis** NINGLA_OFD_033_001 | v1.1

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**Requirements:**
- Analysis: true
- Upload: true
- Annotated: false

**Options:** Video tracking, Wide beam break,
**Center permanence time**  NINGLA_OFD_016_001 | v1.1

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

  **Unit Measured:** s

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**Center permanence time series**  NINGLA_OFD_046_001 | v1.2

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

  **Unit Measured:** s

  **Increments:** 10, 15, 5, 20,

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**Latency to center entry**  NINGLA_OFD_018_001 | v1.1

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

  **Unit Measured:** s

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**Whole arena average speed**  NINGLA_OFD_009_001 | v1.1
simpleParameter

**Center average speed** NINGLA_OFD_017_001 | v1.0

simpleParameter

**Center average speed series** NINGLA_OFD_047_001 | v1.2

seriesParameter

**Equipment ID** NINGLA_OFD_023_001 | v1.0

procedureMetadata
**Number of rears - total** NINGLA_OFD_021_001 | v1.3

*simpleParameter*

**Derivation:** sumOfIncrements('NINGLA_OFD_006_001', 4)

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**Periphery permanence time** NINGLA_OFD_012_001 | v1.1

*simpleParameter*

**Unit Measured:** s

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**Number of Rears** NINGLA_OFD_006_001 | v1.1

*seriesParameter*

**Increments:** 10, 5, 15, 20,
**Color of arena**  NINGLA_OFD_029_001  |  v1.0

_procedureMetadata_

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

Options: Transparent, Grey, Black, White,

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**Periphery distance travelled**  NINGLA_OFD_010_001  |  v1.1

_simpleParameter_

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

Unit Measured: cm

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**Center distance travelled series**  NINGLA_OFD_044_001  |  v1.3

_seriesParameter_

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

Unit Measured: cm

Increments: 20, 5, 15, 10,

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**Number of center entries**  NINGLA_OFD_019_001  |  v1.1

_simpleParameter_
Center resting time series  \textcolor{teal}{NINGLA\_OFD\_045\_001} | v1.3

seriesParameter

Unit Measured: s

Increments: 10, 15, 20, 5,

Periphery distance travelled series  \textcolor{teal}{NINGLA\_OFD\_003\_001} | v1.2

seriesParameter

Unit Measured: cm

Increments: 10, 15, 5, 20,

Software Version  \textcolor{teal}{NINGLA\_OFD\_039\_001} | v1.0

procedureMetadata


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

Periphery permanence time series NINGLA_OFD_042_001 | v1.2

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

- Unit Measured: s
- Increments: 5, 15, 20, 10,

Distance from light source: if direct illumination NINGLA_OFD_031_001 | v1.1

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

- Unit Measured: cm

Percentage center time NINGLA_OFD_022_001 | v1.2
Whole arena permanence \textit{NINGLA\_OFD\_008\_001} \mid v1.1

\textit{simpleParameter}

Unit Measured: \textit{s}

Whole arena resting time \textit{NINGLA\_OFD\_007\_001} \mid v1.1

\textit{simpleParameter}

Unit Measured: \textit{s}

Date equipment last calibrated \textit{NINGLA\_OFD\_041\_001} \mid v1.2

\textit{procedureMetadata}

Unit Measured: \%

Derivation: \texttt{mul(div('NINGLA\_OFD\_016\_001', 'NINGLA\_OFD\_008\_001'), 100)}
**Center resting time** NINGLA_OFD_015_001 | v1.1

*simpleParameter*

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

**Unit Measured:** s

**Arena ID** NINGLA_OFD_038_001 | v1.0

*procedureMetadata*

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

**Periphery resting time series** NINGLA_OFD_004_001 | v1.2

*seriesParameter*

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

**Unit Measured:** s

**Increments:** 5, 15, 10, 20,

**Number of center entries series** NINGLA_OFD_048_001 | v1.1

*seriesParameter*
Increments: 15, 20, 5, 10,

Whole arena resting time series  NINGLA_OFD_001_001  | v1.1

Periphery resting time  NINGLA_OFD_011_001  | v1.1

Periphery average speed series  NINGLA_OFD_043_001  | v1.3
**Unit Measured:** cm/s

**Increments:** 5, 10, 15, 20,

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**Arena Material** NINGLA_OFD_040_001 | v1.0

**procedureMetadata**

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

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**Center distance travelled** NINGLA_OFD_014_001 | v1.1

**simpleParameter**

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

**Unit Measured:** cm

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**Light intensity in the centre of the arena** NINGLA_OFD_027_001 | v1.1

**procedureMetadata**

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

**Unit Measured:** Lux
Start Time  NINGLA_OFD_037_001 | v1.1

Percentage center movement time  NINGLA_OFD_050_001 | v1.0

Resting definition threshold  NINGLA_OFD_051_001 | v1.0
Rearing definition threshold

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

Options: No threshold, 1 second,