Light-Dark Test IMPC_LDT_001

Purpose

To monitor the anxiety-related behaviour of mice in a two-chambered light-dark arena over a defined period of time in order to assess the anxiety phenotype.

Experimental Design

- **Minimum number of animals**: 7M + 7F
- **Age at test**: Week 10
- **Sex**: We would expect the results of this test to show sexual dimorphism

Procedure

1. Light levels are set so that the light intensity within the light arena is between 100 – 200 lux and the dark arena is at 4-7 lux. Light metering is performed at the start of each test day.

2. The method of recording is set up with each arena defined. The light arena is approximately one third to half of entire chamber.

3. One mouse is placed in each light arena and recording is started.

4. A minimum of 5 minute should be recorded up to a maximum of 20 minutes.

5. At the end of the trial, the mice are removed from the arena and returned to their home cages.

6. The chambers are cleaned with disinfectant between mice to decontaminate and remove scent cues from previously tested mice.

7. Analysis of the recording is done to measure the activity of each mouse in each of the two zones and the number of transitions between zones.

Notes

Local data processing may be implemented to calculate derived measures from this data.

Data QC

Local QC data to assure all data fields have recorded data. In the case all data fields have a value of 0 that particular mouse data will be removed.
1. Verify the total time of each run

**Parameters and Metadata**

**Side changes** IMPC_LDT_001_001 | v1.0

seriesParameter


Unit Measured: count

Description: side_changes

Increments: 5, 10, 15, 20,

**Light side time spent** IMPC_LDT_002_001 | v1.0

seriesParameter


Unit Measured: s

Description: light_side_time_spent

Increments: 5, 10, 15, 20,

**Time mobile light side** IMPC_LDT_003_001 | v1.0

seriesParameter
<table>
<thead>
<tr>
<th>Description</th>
<th>Increments</th>
</tr>
</thead>
<tbody>
<tr>
<td>time_mobile_light_side</td>
<td>5, 10, 15, 20</td>
</tr>
<tr>
<td>dark_side_time_spent</td>
<td>5, 10, 15, 20</td>
</tr>
<tr>
<td>time_mobile_dark_side</td>
<td>5, 10, 15, 20</td>
</tr>
</tbody>
</table>
Latency to first transition into dark  IMPC_LDT_006_001 | v1.0

simpleParameter


Unit Measured: s

Description: latency_to_first_transition_into_dark

Percent time in dark  IMPC_LDT_007_001 | v1.0

simpleParameter


Unit Measured: %

Description: percent_time_in_dark

Derivation:
mul(div(sumOfIncrements('IMPC_LDT_004_001',1), add(sumOfIncrements
('IMPC_LDT_004_001',1), sub(sumOfIncrements('IMPC_LDT_002_001',1),
'IMPC_LDT_006_001'))), 100)

Percent time in light  IMPC_LDT_008_001 | v1.0

simpleParameter

Unit Measured: %

Description: percent_time_in_light

Derivation:
\[
\text{mul}\left(\frac{\text{div}\left(\text{sub}\left(\text{sumOfIncrements('IMPC_LDT_002_001',1)}, \text{'IMPC_LDT_006_001'}\right), \text{add}\left(\text{sumOfIncrements('IMPC_LDT_004_001',1)}, \text{sub}\left(\text{sumOfIncrements('IMPC_LDT_002_001',1)}, \text{'IMPC_LDT_006_001'}\right)\right)}{100}\right)
\]

Transition IMPC_LDT_009_001 | v1.1

Description: transition

Options: No, Yes,

Light side distance travelled IMPC_LDT_010_001 | v1.0

Unit Measured: cm

Description: light_side_distance_travelled

Increments: 5, 10, 15, 20,
**Dark side distance travelled** IMPC_LDT_011_001 | v1.0

*seriesParameter*

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

**Unit Measured:** cm

**Description:** dark_side_distance_travelled

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

**-----------------------------------------------**

**Vertical activity (rearing)** IMPC_LDT_012_001 | v1.0

*seriesParameter*

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

**Unit Measured:** count

**Description:** vertical_activity_rearing

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

**-----------------------------------------------**

**Horizontal activity** IMPC_LDT_013_001 | v1.0

*seriesParameter*

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

**Unit Measured:** count

**Description:** horizontal_activity
Repetitive beam break ('stereotypy counts') IMPC_LDT_014_001 | v1.0

seriesParameter


Unit Measured: count

Description: repetitive_beam_break_stereotypy_counts

Increments: 5, 10, 15, 20,

Total distance travelled IMPC_LDT_015_001 | v1.0

seriesParameter


Unit Measured: cm

Description: total_distance_travelled

Increments: 5, 10, 15, 20,

Light level light chamber IMPC_LDT_016_001 | v1.0
**Light level light chamber** IMPC_LDT_017_001 | v1.0

**Unit Measured:** Lux

**Description:** light_level_light_chamber

**Options:** 100 - 200, 275 Lux,

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**Experiment ID** IMPC_LDT_018_001 | v1.0

**Description:** experimenter_id
**Start time**  IMPC_LDT_019_001 | v1.0

procedureMetadata

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

Description: start_time

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**Arena ID**  IMPC_LDT_020_001 | v1.0

procedureMetadata

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

Description: arena_id

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**Arena version**  IMPC_LDT_021_001 | v1.0

procedureMetadata

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

Description: arena_version

Options: Custom made, MED-OFAS-RSU,

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**Equipment ID**  IMPC_LDT_022_001 | v1.0

procedureMetadata
Description: equipment_id
Options: Light-Dark Insert, Custom made, Dark Box Insert ENV-516,

Equipment manufacturer IMPC_LDT_023_001 | v1.0

Description: equipment_manufacturer
Options: Accuscan, Custom made, Med Association Inc., Med Associates,

Equipment model IMPC_LDT_024_001 | v1.0

Description: equipment_model
Options: Versamax, Custom made, Activity Test Chamber ENV-515,

Disinfectant IMPC_LDT_025_001 | v1.0
**disinfectant**

**Options:** Alcohol, Pursept-A, 50% alcohol, 1% Virkon solution, 10% Nolvasan Solution, 70% ethanol, Clidox, 70% Isopropanol, Distel 2%, 50% Ethanol,

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**Starting position** IMPC_LDT_026_001 | v1.0

**Options:** Facing away from entry, Facing towards entry,

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**Light-Dark box’s walls opaque** IMPC_LDT_027_001 | v1.0

**Options:** Yes, No,
**Light-Dark box set-up** IMPC_LDT_028_001 | v1.0

**procedureMetadata**

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

**Description:** light_dark_box_set_up

**Options:** Cabinet enclosure, Standalone,

**Light side arena dimensions (L x W x H, in mm)** IMPC_LDT_029_001 | v1.0

**procedureMetadata**

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

**Description:** light_side_arena_dimensions_L_x_W_x_H_in_mm

**Options:** 180 x 207 x 140, 431.8 x 212.725 x 203.2, 433 x 215 x 305, 250 x 190 x 250,

**Dark side arena dimensions (L x W x H, in mm)** IMPC_LDT_030_001 | v1.0

**procedureMetadata**

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

**Description:** dark_side_arena_dimensions_L_x_W_x_H_in_mm

**Options:** 180 x 207 x 140, 431.8 x 212.725 x 203.2, 425 x 210 x 305, 150 x 190 x 250,
Entry way dimensions (L x W x H, in mm) IMPC_LDT_031_001 | v1.0

Description: entry_way_dimensions_l_x_w_x_h_in_mm

Options: 5 x 100 x 40, 101.6 x 3.175 x 101.6, 90 x 3 x 115, 5 x 100 x 50,

Time spent in the light side in the first 5 minutes IMPC_LDT_032_001 | v1.0

Derivation:
ifElse('IMPC_LDT_006_001'<300, sub(incrementValue('IMPC_LDT_002_001', 1),'IMPC_LDT_006_001'), 300)

Test duration IMPC_LDT_033_001 | v1.0

Unit Measured: min
Options: 5, 20, 10, 15,

Software version IMPC_LDT_034_001 | v1.0


Options: Activity Monitor V6.02, Activity Monitor V7.0.5.10, Versamap Version 1.7,