

# Fear Conditioning IMPC\_FEA\_001

## Purpose

This procedure is used for measuring aversive learning and memory. A neutral conditioned stimulus (CS) such as steady tone is paired with an aversive unconditioned stimulus (US) such as one or more mild foot shocks. After conditioning, the spatial context or the CS (tone) elicits a central state of fear in the absence of the US (shock) that is expressed as reduced locomotor activity or total lack of movement (freezing). Immobility time is used as a measure of learning/memory performances.

## Experimental Design

- **Minimum number of animals :** 7M + 7F
- **Age at test:** Week 11
- **Sex:** We would expect the results of this test to show sexual dimorphism

## Equipment

- Fear conditioning chambers
- Arenas and components for cue and conditioning phases
- Computer with recording software
- Olfactory substance

## Procedure

1. Day 1: Conditioning
  - a. Transport animals to the testing area.
  - b. Set up conditioning arenas in the chambers ensuring that shocker, tone delivery and camera / beam break system are working correctly. If using video tracking equipment, ensure camera lenses are free of dust.
  - c. Remove the animals from their cages and place in the arenas. Animals are conditioned using the training protocol which consists of a baseline period, audible tone, a single foot shock that co-terminates with the tone, and a period with no stimuli at the end.
  - d. Remove animals from arenas and place back in home cage. Clean arenas.
2. Day 2: Context
  - a. To be performed 24 hours after conditioning.
  - b. Transport animals to the testing area.
  - c. Set up conditioning arenas in the chamber as on day 1 except for shocker and tone delivery system which are not used.
  - d. Remove animals from their cages and place in the arena. No CS or US stimuli are presented.

- e. Remove animals from arenas and place back in home cage. Clean arenas.
- 3. Day 2: Cue
  - a. To be performed performed from 2 - 24 hours after the context protocol.
  - b. Set up cue arenas using different floors, walls, olfactory cues and / or lighting from the conditioning context. Ensure that tone delivery and camera / beam break system are working correctly.
  - c. Remove animals from their cages and place in the arena. Animals are exposed to a baseline period without any stimulus followed by the presentation of the tone.
  - d. Remove animals from arenas and place back in home cage. Clean arenas.
- 4. At the end of the cue protocol animals are placed back into their holding room and data is analyzed by collecting the number of freezing episodes and the total freezing /immobility time.

## Parameters and Metadata

### Conditioning Baseline Freeze Count IMPC\_FEA\_001\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Description: conditioning\_baseline\_freeze\_count

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### Conditioning Baseline Freezing Time IMPC\_FEA\_002\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Unit Measured: s

Description: conditioning\_baseline\_freezing\_time

---

### Conditioning Baseline % Freezing Time IMPC\_FEA\_003\_001 | v1.1

simpleParameter

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

Unit Measured: %

Description: conditioning\_baseline\_freezing\_time

Derivation: mul(div('IMPC\_FEA\_002\_001', 'IMPC\_FEA\_033\_001'), 100)

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## Conditioning Baseline Average Motion Index IMPC\_FEA\_004\_001 | v1.0

simpleParameter

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

Description: conditioning\_baseline\_average\_motion\_index

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## Conditioning Baseline Minimum Motion Index IMPC\_FEA\_005\_001 | v1.0

simpleParameter

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

Description: conditioning\_baseline\_minimum\_motion\_index

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# Conditioning Baseline Maximum Motion Index IMPC\_FEA\_006\_001 | v1.0

simpleParameter

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

Description: conditioning\_baseline\_maximum\_motion\_index

---

# Context Freeze Count IMPC\_FEA\_007\_001 | v1.0

simpleParameter

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

Description: context\_freeze\_count

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# Context Freezing Time IMPC\_FEA\_008\_001 | v1.0

simpleParameter

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

Unit Measured: s

Description: context\_freezing\_time

---

# Context % Freezing Time IMPC\_FEA\_009\_001 | v1.1

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Unit Measured: %

Description: context\_freezing\_time

Derivation: mul(div('IMPC\_FEA\_008\_001', 'IMPC\_FEA\_049\_001'), 100)

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## Context Average Motion Index IMPC\_FEA\_010\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Description: context\_average\_motion\_index

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## Context Minimum Motion Index IMPC\_FEA\_011\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Description: context\_minimum\_motion\_index

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## Context Maximum Motion Index IMPC\_FEA\_012\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Description: context\_maximum\_motion\_index

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**Cue Baseline Freeze Count** IMPC\_FEA\_013\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Description: cue\_baseline\_freeze\_count

---

**Cue Baseline Freezing Time** IMPC\_FEA\_014\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Unit Measured: s

Description: cue\_baseline\_freezing\_time

---

**Cue Baseline % Freezing Time** IMPC\_FEA\_015\_001 | v1.1

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

**Unit Measured:** %

**Description:** cue\_baseline\_freezing\_time

**Derivation:** mul(div('IMPC\_FEA\_014\_001', 'IMPC\_FEA\_057\_001'), 100)

---

## Cue Baseline Average Motion Index IMPC\_FEA\_016\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Description:** cue\_baseline\_average\_motion\_index

---

## Cue Baseline Minimum Motion Index IMPC\_FEA\_017\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Description:** cue\_baseline\_minimum\_motion\_index

---

## Cue Baseline Maximum Motion Index IMPC\_FEA\_018\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Description:** cue\_baseline\_maximum\_motion\_index

---

**Cue Tone Freeze Count** IMPC\_FEA\_019\_001 | v1.0

seriesParameter

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

**Description:** cue\_tone\_freeze\_count

**Increments:** Minimum 1

---

**Cue Tone Freezing Time** IMPC\_FEA\_020\_001 | v1.0

seriesParameter

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

**Unit Measured:** s

**Description:** cue\_tone\_freezing\_time

**Increments:** Minimum 1

---

**Cue Tone % Freezing Time** IMPC\_FEA\_021\_001 | v1.1

simpleParameter

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



**Unit Measured:** %

**Description:** cue\_tone\_freezing\_time

**Derivation:**

mul(div(sumOfIncrements('IMPC\_FEA\_020\_001',1), 'IMPC\_FEA\_060\_001'), 100)

---

## Cue Tone Average Motion Index IMPC\_FEA\_022\_001 | v1.0

seriesParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Description:** cue\_tone\_average\_motion\_index

**Increments:** Minimum 1

---

## Cue Tone Minimum Motion Index IMPC\_FEA\_023\_001 | v1.0

seriesParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Description:** cue\_tone\_minimum\_motion\_index

**Increments:** Minimum 1

---

## Cue Tone Maximum Motion Index IMPC\_FEA\_024\_001 | v1.0

seriesParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Description:** cue\_tone\_maximum\_motion\_index

**Increments:** Minimum 1

---

## **Conditioning: Date and time** IMPC\_FEA\_025\_001 | v1.0

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** false

**Description:** conditioning\_date\_and\_time

---

## **Conditioning: Room acclimation time** IMPC\_FEA\_026\_001 | v1.0

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** false

**Unit Measured:** min

**Description:** conditioning\_room\_acclimation\_time

**Options:** 30, 60,

---

# Conditioning: White house light level in arena IMPC\_FEA\_027\_

001 | v1.0

procedureMetadata

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

Unit Measured: Lux

Description: conditioning\_white\_house\_light\_level\_in\_arena

Options: 26, 100, 200, 40,

---

# Conditioning: Olfactory cue IMPC\_FEA\_028\_001 | v1.0

procedureMetadata

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

Description: conditioning\_olfactory\_cue

Options: Alcohol, None,

---

# Conditioning: Mouse arena shape IMPC\_FEA\_029\_001 | v1.0

procedureMetadata

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

Description: conditioning\_mouse\_arena\_shape

Options: Rectangle, Square,

---

## Conditioning: Mouse arena dimension IMPC\_FEA\_030\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Unit Measured: cm

Description: conditioning\_mouse\_arena\_dimension

Options: 30.5 L X 24.1 W X 24.5 H cm, 16.6 L X 17 W X 25 H cm, 25 L x 21 W x 19 H cm, 25 x 25 x 19 cm, 17 x 17 x 25 cm, 30.5 cm L X 24.1 cm W X 21 cm H,

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## Conditioning: Mouse arena colour IMPC\_FEA\_031\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Description: conditioning\_mouse\_arena\_colour

Options: Metallic, White and Clear, Clear, White, Metallic, clear,

---

## Conditioning: Mouse arena floor IMPC\_FEA\_032\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

**Description:** conditioning\_mouse\_arena\_floor

**Options:** Metal grill, Clean saw dust, Steel rods,

---

**Conditioning: Length of time baseline** IMPC\_FEA\_033\_001 | v1.0  
procedureMetadata

**Req. Analysis:** true

**Req. Upload:** true

**Is Annotated:** false

**Unit Measured:** s

**Description:** conditioning\_length\_of\_time\_baseline

**Options:** 240, 150, 120,

---

**Conditioning: Tone stimulus intensity ( dB; conditioned stimulus)** IMPC\_FEA\_034\_001 | v1.0  
procedureMetadata

**Req. Analysis:** true

**Req. Upload:** true

**Is Annotated:** false

**Unit Measured:** dB

**Description:** conditioning\_tone\_stimulus\_intensity\_db\_conditioned\_stimulus

**Options:** 85, 80, 75, 77, 70,

---

**Conditioning: Tone stimulus frequency (Hz; conditioned stimulus)** IMPC\_FEA\_035\_001 | v1.0

procedureMetadata

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

Unit Measured: kHz

Description: conditioning\_tone\_stimulus\_frequency\_hz\_conditioned\_stimulus

Options: 10, 2.8, 4, 2,

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**Conditioning: Length of time tone stimulus** IMPC\_FEA\_036\_001 | v1.0

procedureMetadata

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

Unit Measured: s

Description: conditioning\_length\_of\_time\_tone\_stimulus

Options: 20, 30,

---

**Conditioning: Shock stimulus intensity (unconditioned stimulus)** IMPC\_FEA\_037\_001 | v1.1

procedureMetadata

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

**Unit Measured:** mA

**Description:** conditioning\_shock\_stimulus\_intensity\_unconditioned\_stimulus

**Options:** 0.4, 0.5, 0.75,

---

## Conditioning: Length of time shock stimulus IMPC\_FEA\_038\_01 | v1.0

procedureMetadata

**Req. Analysis:** true

**Req. Upload:** true

**Is Annotated:** false

**Unit Measured:** s

**Description:** conditioning\_length\_of\_time\_shock\_stimulus

**Options:** 0.5, 1, 2,

---

## Conditioning: Length of time no stimulus IMPC\_FEA\_039\_001 | v1.0

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** false

**Unit Measured:** s

**Description:** conditioning\_length\_of\_time\_no\_stimulus

**Options:** 120, 150,

---

## Conditioning: Total time IMPC\_FEA\_040\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Unit Measured: s

Description: conditioning\_total\_time

Options: 380, 300,

---

## Context: Date and time IMPC\_FEA\_041\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Description: context\_date\_and\_time

Options: Conditioning +24h,

---

## Context: Room acclimation time IMPC\_FEA\_042\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Unit Measured: min



**Description:** context\_room\_acclimation\_time

**Options:** 30, 60,

---

**Context: White house light level in arena** IMPC\_FEA\_043\_001 | v1  
.2

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** false

**Unit Measured:** Lux

**Description:** context\_white\_house\_light\_level\_in\_arena

**Options:** 26, 100, 200, 40,

---

**Context: Olfactory cue** IMPC\_FEA\_044\_001 | v1.0

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** false

**Description:** context\_olfactory\_cue

**Options:** Alcohol, None,

---

**Context: Mouse arena shape** IMPC\_FEA\_045\_001 | v1.0

procedureMetadata

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

Description: context\_mouse\_arena\_shape

Options: Rectangle, Square,

-----

**Context: Mouse arena dimension** IMPC\_FEA\_046\_001 | v1.0

procedureMetadata

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

Unit Measured: cm

Description: context\_mouse\_arena\_dimension

Options: 30.5 cm L X 24.1 cm W X 24.5 cm H, 16.6 cm L X 17 cm W X 25 cm H,  
25 L x 21 W x 19 H cm, 25 x 25 x 19 cm, 17 x 17 x 25 cm,  
30.5 cm L X 24.1 cm W X 21 cm H,

-----

**Context: Mouse arena colour** IMPC\_FEA\_047\_001 | v1.0

procedureMetadata

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

Description: context\_mouse\_arena\_colour

Options: Metallic, White and Clear, Clear, White, Metallic, clear,

---

## Context: Mouse arena floor IMPC\_FEA\_048\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Description: context\_mouse\_arena\_floor

Options: Metal grill, Steel rods,

---

## Context: Total time IMPC\_FEA\_049\_001 | v1.0

procedureMetadata

Req. Analysis: true

Req. Upload: true

Is Annotated: false

Unit Measured: s

Description: context\_total\_time

Options: 360, 300,

---

## Cue: Date and time IMPC\_FEA\_050\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Description: cue\_date\_and\_time

**Options:** Context + 2-4h, Context + 4h, Context + 24h,

---

## **Cue: White house light level in arena** IMPC\_FEA\_051\_001 | v1.1

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** false

**Unit Measured:** Lux

**Description:** cue\_white\_house\_light\_level\_in\_arena

**Options:** 0, 16, 14-18,

---

## **Cue: Olfactory cue** IMPC\_FEA\_052\_001 | v1.0

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** false

**Description:** cue\_olfactory\_cue

**Options:** 5% acetic acid, Vanillin, Cinnamon,

---

## **Cue: Mouse arena shape** IMPC\_FEA\_053\_001 | v1.0

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** false

**Description:** cue\_mouse\_arena\_shape

**Options:** A frame ceiling, Cylinder, Rectangle,

---

## Cue: Mouse arena dimension IMPC\_FEA\_054\_001 | v1.0

[procedureMetadata](#)

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** false

**Unit Measured:** cm

**Description:** cue\_mouse\_arena\_dimension

**Options:** 30.5 cm L X 24.1 cm W X 24.5cm H, 20 cm dia X 30 cm H, 25 L x 21 W x 19 H cm, 25 x 25 x 19 cm, 17 x 17 x 25 cm, 30.5 cm L X 24.1 cm W X 21 cm H,

---

## Cue: Mouse arena colour IMPC\_FEA\_055\_001 | v1.0

[procedureMetadata](#)

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** false

**Description:** cue\_mouse\_arena\_colour

**Options:** Black and white, Red, Clear, Beige, black and white,

---

## Cue: Mouse arena floor IMPC\_FEA\_056\_001 | v1.0

[procedureMetadata](#)

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** false

**Description:** cue\_mouse\_arena\_floor

**Options:** PVC, Plexi glass, Polyethylene, Perspex,

---

## **Cue: Length of time baseline** IMPC\_FEA\_057\_001 | v1.0

[procedure](#)[Metadata](#)

**Req. Analysis:** true

**Req. Upload:** true

**Is Annotated:** false

**Unit Measured:** s

**Description:** cue\_length\_of\_time\_baseline

**Options:** 120,

---

## **Cue: Tone stimulus intensity (conditioned stimulus)** IMPC\_F

EA\_058\_001 | v1.1

[procedure](#)[Metadata](#)

**Req. Analysis:** true

**Req. Upload:** true

**Is Annotated:** false

**Unit Measured:** dB

**Description:** cue\_tone\_stimulus\_intensity\_conditioned\_stimulus

**Options:** 85, 80, 75, 77, 70,

---

## Cue: Tone stimulus frequency (Hz; conditioned stimulus) |

MPC\_FEA\_059\_001 | v1.0

procedureMetadata

Req. Analysis: true

Req. Upload: true

Is Annotated: false

Unit Measured: kHz

Description: cue\_tone\_stimulus\_frequency\_hz\_conditioned\_stimulus

Options: 10, 2.8, 4, 2,

---

## Cue: tone response measurement time IMPC\_FEA\_060\_001 | v1.0

procedureMetadata

Req. Analysis: true

Req. Upload: true

Is Annotated: false

Unit Measured: s

Options: 120, 180,

---

## Cue: Length of time no stimulus IMPC\_FEA\_061\_001 | v1.0

procedureMetadata

Req. Analysis: true

Req. Upload: true

Is Annotated: false

Unit Measured: s

**Description:** cue\_length\_of\_time\_no\_stimulus

**Options:** 120, 0, 220,

---

**Cue: Total time** IMPC\_FEA\_062\_001 | v1.0

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** false

**Unit Measured:** s

**Description:** cue\_total\_time

**Options:** 480, 300, 420, 240,

---

**Mouse arenaID** IMPC\_FEA\_063\_001 | v1.0

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** false

**Description:** mouse\_arenaid

**Options:** Arena 1, Arena 2, Arena 3, Arena 4, Arena 5, Arena 6, Arena 7, Arena 8,

---

**Equipment ID** IMPC\_FEA\_064\_001 | v1.0

procedureMetadata



**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** false

**Description:** equipment\_id

**Options:** Machine A, Machine B, Machine 1, Machine 2,

---

## Equipment Manufacturer IMPC\_FEA\_065\_001 | v1.0

procedureMetadata

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** false

**Description:** equipment\_manufacturer

**Options:** Med Assoicates, Ugo Basile, San Diego Instruments,

---

## Equipment Model IMPC\_FEA\_066\_001 | v1.0

procedureMetadata

**Req. Analysis:** true

**Req. Upload:** true

**Is Annotated:** false

**Description:** equipment\_model

**Options:** MED-FVC-SCT-M, Freeze monitor, FearCS Mouse-46152, MED-VFC2-SCT-M, 46000, MED-VFC-NIR-M SOP #1, MED-VFC-NIR-M SOP #3, MED-VFC-NIR-M SOP #2,

---

## Tracking Method IMPC\_FEA\_067\_001 | v1.0

procedureMetadata

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

Description: tracking\_method

Options: Video tracking, Beam break,

-----

**Software** IMPC\_FEA\_068\_001 | v1.0

procedureMetadata

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

Description: software

Options: Med Associates Video Freeze, Anymaze, Freeze Monitor,

-----

**Sound generator manufacturer** IMPC\_FEA\_069\_001 | v1.0

procedureMetadata

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

Description: sound\_generator\_manufacturer

Options: Med Associates, Ugo Basile, San Diego Instruments,

-----

# Sound generator model IMPC\_FEA\_070\_001 | v1.0

procedureMetadata

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

Description: sound\_generator\_model

Options: VFC-100, other, 46000-165,

---

# Sound-proof box dimension IMPC\_FEA\_071\_001 | v1.0

procedureMetadata

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

Description: sound\_proof\_box\_dimension

Options: 71 cm L X 63.5 cm W X 35.5 cm H, 71 cm L X 59.7 cm W X 31.7 cm H, other, 47 cm L X 35 cm W X 49 cm H,

---

# Experimenter ID IMPC\_FEA\_072\_001 | v1.0

procedureMetadata

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

Description: experimenter\_id

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# Experimenter ID day 2 IMPC\_FEA\_073\_001 | v1.0

procedureMetadata

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

Description: experimenter\_id\_day\_2

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# Experimenter ID day 2 cue IMPC\_FEA\_074\_001 | v1.0

procedureMetadata

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

Description: experimenter\_id\_day\_2\_cue

-----

# Date equipment last calibrated (shock) IMPC\_FEA\_075\_001 | v1.0

procedureMetadata

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

Description: date\_equipment\_last\_calibrated\_shock

-----

# Date equipment last calibrated (tone) IMPC\_FEA\_076\_001 | v1.0

procedureMetadata

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

**Description:** date\_equipment\_last\_calibrated\_tone

---

**Freeze definition** IMPC\_FEA\_077\_001 | v1.1

[procedureMetadata](#)

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

**Unit Measured:** s

**Description:** freeze\_definition

**Options:** 1, 2, 0.25,

---

**Conditioning: Near infra red light arena** IMPC\_FEA\_078\_001 | v1.0

[procedureMetadata](#)

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

**Description:** conditioning\_near\_infra\_red\_light\_arena

**Options:** On,

---

**Context: Near infra red light arena** IMPC\_FEA\_079\_001 | v1.0

[procedureMetadata](#)

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

Description: context\_near\_infra\_red\_light\_arena

Options: On,

---

## Cue: Near infra red light arena IMPC\_FEA\_080\_001 | v1.0

[procedureMetadata](#)

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

Description: cue\_near\_infra\_red\_light\_arena

Options: On,

---

## Conditioning: Start time of baseline IMPC\_FEA\_081\_001 | v1.0

[procedureMetadata](#)

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

Unit Measured: s

Description: conditioning\_start\_time\_of\_baseline

---

## Conditioning: Start time of each tone stimulus IMPC\_FEA\_082\_001 | v1.0

procedureMetadata

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

Unit Measured: s

Description: conditioning\_start\_time\_of\_each\_tone\_stimulus

---

**Conditioning: Start time of each shock stimulus** IMPC\_FEA\_083\_001 | v1.0

procedureMetadata

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

Unit Measured: s

Description: conditioning\_start\_time\_of\_each\_shock\_stimulus

---

**Conditioning: Start time of no stimulus** IMPC\_FEA\_084\_001 | v1.0

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

Unit Measured: s

Description: conditioning\_start\_time\_of\_no\_stimulus

---

**Cue: Start time of baseline** IMPC\_FEA\_085\_001 | v1.0

procedureMetadata

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

Unit Measured: s

Description: cue\_start\_time\_of\_baseline

---

**Cue: Start time of each tone stimulus** IMPC\_FEA\_086\_001 | v1.0

procedureMetadata

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

Unit Measured: s

Description: cue\_start\_time\_of\_each\_tone\_stimulus

---

**Cue: Start time of no stimulus** IMPC\_FEA\_087\_001 | v1.0

procedureMetadata

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

Unit Measured: s

Description: cue\_start\_time\_of\_no\_stimulus

---



**Cue: arena rotation** IMPC\_FEA\_088\_001 | v1.0

procedureMetadata

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

Description: cue\_arena\_rotation

Options: 90 degrees,

---

**Conditioning Tone Freeze Count** IMPC\_FEA\_089\_001 | v1.0

simpleParameter

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

Description: conditioning\_tone\_freeze\_count

---

**Conditioning Tone Freezing Time** IMPC\_FEA\_090\_001 | v1.0

simpleParameter

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

Unit Measured: s

Description: conditioning\_tone\_freezing\_time

---

# Conditioning Tone % Freezing Time IMPC\_FEA\_091\_001 | v1.1

simpleParameter

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

Unit Measured: %

Description: conditioning\_tone\_freezing\_time

Derivation:  $\text{mul}(\text{div}(\text{'IMPC\_FEA\_090\_001'}, \text{'IMPC\_FEA\_036\_001'}), 100)$

---

# Conditioning Tone Average Motion Index IMPC\_FEA\_092\_001 | v1.0

simpleParameter

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

Description: conditioning\_tone\_average\_motion\_index

---

# Conditioning Tone Minimum Motion Index IMPC\_FEA\_093\_001 | v1.0

simpleParameter

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

Description: conditioning\_tone\_minimum\_motion\_index

---

**Conditioning Tone Maximum Motion Index** IMPC\_FEA\_094\_001 |  
v1.0

simpleParameter

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

Description: conditioning\_tone\_maximum\_motion\_index

---

**Conditioning Shock Average Motion Index** IMPC\_FEA\_095\_001 |  
v1.0

simpleParameter

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

Description: conditioning\_shock\_average\_motion\_index

---

**Conditioning Shock Minimum Motion Index** IMPC\_FEA\_096\_001  
| v1.0

simpleParameter

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

Description: conditioning\_shock\_minimum\_motion\_index

---

# Conditioning Shock Maximum Motion Index IMPC\_FEA\_097\_001

| v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Description: conditioning\_shock\_maximum\_motion\_index

---

# Conditioning Post-shock Freeze Count IMPC\_FEA\_098\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Description: conditioning\_post\_shock\_freeze\_count

---

# Conditioning Post-shock Freezing Time IMPC\_FEA\_099\_001 | v1.

0

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Unit Measured: s

Description: conditioning\_post\_shock\_freezing\_time

---

# Conditioning Post-shock % Freezing Time IMPC\_FEA\_100\_001 | v1.1

simpleParameter

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

Unit Measured: %

Description: conditioning\_post\_shock\_freezing\_time

Derivation:  $\text{mul}(\text{div}(\text{'IMPC\_FEA\_099\_001'}, \text{'IMPC\_FEA\_039\_001'}), 100)$

---

# Conditioning Post-shock Average Motion Index IMPC\_FEA\_101\_001 | v1.0

simpleParameter

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

Description: conditioning\_post\_shock\_average\_motion\_index

---

# Conditioning Post-shock Minimum Motion Index IMPC\_FEA\_102\_001 | v1.0

simpleParameter

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

Description: conditioning\_post\_shock\_minimum\_motion\_index

---

# Conditioning Post-shock Maximum Motion Index IMPC\_FEA\_103\_001 | v1.0

simpleParameter

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

Description: conditioning\_post\_shock\_maximum\_motion\_index

---

# Freeze definition (minimum motion index) IMPC\_FEA\_104\_001 | v1.0

procedureMetadata

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

Description: freeze\_definition\_minimum\_motion\_index

Options: 18, 30,

---

# Difference in Context and Conditioning Baseline % Freezing IMPC\_FEA\_105\_001 | v1.0

simpleParameter

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

**Derivation:**

sub(mul(div('IMPC\_FEA\_008\_001', 'IMPC\_FEA\_049\_001'), 100), mul(div('IMPC\_FEA\_002\_001', 'IMPC\_FEA\_033\_001'), 100))

---

## Difference in Cue Tone and Cue Baseline % Freezing IMPC\_

FEA\_106\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

**Derivation:**

sub(mul(div('IMPC\_FEA\_020\_001', 'IMPC\_FEA\_060\_001'), 100), mul(div('IMPC\_FEA\_014\_001', 'IMPC\_FEA\_057\_001'), 100))

---

## Difference in Conditioning Post-shock and Conditioning Baseline % Freezing IMPC\_FEA\_107\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

**Derivation:**

sub(mul(div('IMPC\_FEA\_099\_001', 'IMPC\_FEA\_039\_001'), 100), mul(div('IMPC\_FEA\_002\_001', 'IMPC\_FEA\_033\_001'), 100))

---

## Cue: Length of time tone stimulus IMPC\_FEA\_108\_001 | v1.0

Req. Analysis: true

Req. Upload: false

Is Annotated: false

Unit Measured: s

Options: 20, 120,

-----