

# Challenge Whole Body Plethysmography IM

## PC\_CHL\_001

### Purpose

The purpose of this procedure is to record the respiratory function of mice, when submitted to methacholine or hypoxia challenge. Other similar protocols, for allergen sensitization and for LPS challenges, will also be available.

Ontological description: MP:0002327 - abnormal respiratory function

### Experimental Design

- **Minimum number of animals :** 4M + 4F
- **Age at test:** Week 13

### Equipment

1. Scale/balance
2. Flow chambers
3. Plethysmographs
4. Nebulizers
5. Computer connected to flow chamber
6. Challenge reagents
7. Personal safety equipment (masks, gloves, etc.)

### Procedure

1. Before starting, make sure the chambers are calibrated
2. Weigh the mouse and transfer to test room
3. Turn on amplifier, nebulizer and computer
4. Place the mouse in the chamber
5. Methacholine challenge:
  1. Nebulize with PBS for 2 minutes
  2. Measure response to PBS for 5 minutes
  3. Nebulize with 12.5mg/ml MCh for 2 minutes
  4. Measure response to 12.5mg/ml for 5 minutes
  5. Nebulize with 25mg/ml MCh for 2 minutes
  6. Measure response to 25mg/ml for 5 minutes
  7. Nebulize with 50mg/ml MCh for 2 minutes
  8. Measure response to 50mg/ml MCh for 5 minutes

6. Additional optional hypoxia challenge:
  1. Measure response unchallenged for 5 minutes
  2. Measure response baseline for 5 minutes
  3. Measure response to challenge with 10% O2 for 5 minutes
  4. Measure response to challenge with 21% O2 for 5 minutes
7. Remove the mouse from its chamber and place back in the home cage.

## Notes

If any animal is manifesting difficulties at any stage of the procedure, regardless of the test, it should be removed from the nebulizing chamber and allowed to recover. It should not go through the rest of the test nor re-tested.

Aerosolized methacholine leads to bronchoconstriction; Asthmatic patients should not handle this substance nor be present in the room where the challenge takes place due to high risk of asthma attack and health hazard.

## Parameters and Metadata

### Body weight IMPC\_CHL\_001\_001 | v1.1

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Unit Measured: g

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### Frequency of breathing (f) IMPC\_CHL\_002\_001 | v1.5

seriesParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: true

Unit Measured: bpm

Increments: Minimum 1

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**Tidal volume (TVb)** IMPC\_CHL\_003\_001 | v1.2

seriesParameter

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

Unit Measured: ml

Increments: Minimum 1

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**Minute volume (MVb)** IMPC\_CHL\_004\_001 | v1.2

seriesParameter

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

Unit Measured: ml/min

Increments: Minimum 1

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**Peak expiratory flow (PEFb)** IMPC\_CHL\_005\_001 | v1.2

seriesParameter

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

Unit Measured: ml/s

Increments: Minimum 1

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**Peak inspiratory flow (PIFb)** IMPC\_CHL\_006\_001 | v1.2

seriesParameter

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

Unit Measured: ml/s

Increments: Minimum 1

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**Pause (PAU)** IMPC\_CHL\_007\_001 | v1.2

seriesParameter

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

Unit Measured: s

Increments: Minimum 1

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**Inspiratory time (Ti)** IMPC\_CHL\_008\_001 | v1.2

seriesParameter

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

Unit Measured: s

Increments: Minimum 1

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## Expiratory time (Te) IMPC\_CHL\_009\_001 | v1.3

seriesParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: true

Unit Measured: s

Increments: Minimum 1

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## Relaxation time (Tr) IMPC\_CHL\_010\_001 | v1.2

seriesParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: true

Unit Measured: s

Increments: Minimum 1

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## Time of pause (Tp) IMPC\_CHL\_011\_001 | v1.3

seriesParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Unit Measured: s

Increments: Minimum 1

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## Enhanced pause (Penh) IMPC\_CHL\_012\_001 | v1.2

seriesParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: true

Increments: Minimum 1

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## Rejection index (Rinx) IMPC\_CHL\_013\_001 | v1.2

seriesParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Increments: Minimum 1

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## Rpef IMPC\_CHL\_014\_001 | v1.2

seriesParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: true

Increments: Minimum 1

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## TB IMPC\_CHL\_015\_001 | v1.2

seriesParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** true

**Unit Measured:** %

**Increments:** Minimum 1

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## Compensation (Comp) IMPC\_CHL\_016\_001 | v1.2

seriesParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Increments:** Minimum 1

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## Flow at point 50% TV expired (EF50) IMPC\_CHL\_017\_001 | v1.2

seriesParameter

**Req. Analysis:** false

**Req. Upload:** true

**Is Annotated:** true

**Unit Measured:** ml/s

**Increments:** Minimum 1

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## Equipment ID IMPC\_CHL\_018\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

**Experimenter ID** IMPC\_CHL\_019\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

**Equipment manufacturer** IMPC\_CHL\_020\_001 | v1.1

procedureMetadata

Req. Analysis: true

Req. Upload: true

Is Annotated: false

Options: Buxco,

**Equipment model** IMPC\_CHL\_021\_001 | v1.1

procedureMetadata

Req. Analysis: true

Req. Upload: true

Is Annotated: false

**Date equipment last calibrated** IMPC\_CHL\_022\_001 | v1.2

procedureMetadata



Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Chamber temperature (Tc) IMPC\_CHL\_026\_001 | v1.1

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Unit Measured: C

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## Relative Humidity (RH) IMPC\_CHL\_027\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Unit Measured: %

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## Hypoxia challenge data present in submission IMPC\_CHL\_029\_001 | v1.1

procedureMetadata

Req. Analysis: true

Req. Upload: true

Is Annotated: false

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## Methacholine challenge: duration of PBS measurement period

IMPC\_CHL\_023\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Unit Measured: min

Description: Length in minutes of the period for measuring reaction to PBS.

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## Methacholine challenge: duration of 12.5 mg/ml MCh measurement period

IMPC\_CHL\_024\_001 | v1.2

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Unit Measured: min

Description: Length in minutes of the period for measuring reaction to 12.5mg/ml MCh.

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## Methacholine challenge: duration of 25 mg/ml MCh measurement period

IMPC\_CHL\_025\_001 | v1.1

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Unit Measured: min

Description: Length in minutes of the period for measuring reaction to 25mg/ml MCh.

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## Methacholine challenge: duration of 50 mg/ml MCh measurement period

IMPC\_CHL\_030\_001 | v1.3

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

Unit Measured: min

Description: Length in minutes of the period for measuring reaction to 50mg/ml MCh.

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## Methacholine challenge: start of PBS measurement timestamp

IMPC\_CHL\_031\_001 | v1.1

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

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## Methacholine challenge: end of PBS measurement timestamp

IMPC\_CHL\_032\_001 | v1.1

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

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**Methacholine challenge: start of 12.5 mg/ml MCh measurement timestamp** IMPC\_CHL\_033\_001 | v1.2

procedureMetadata

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

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**Methacholine challenge: end of 12.5 mg/ml MCh measurement timestamp** IMPC\_CHL\_034\_001 | v1.2

procedureMetadata

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

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**Methacholine challenge: start of 25 mg/ml MCh measurement timestamp** IMPC\_CHL\_035\_001 | v1.3

procedureMetadata

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

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**Methacholine challenge: end of 25 mg/ml MCh measurement timestamp** IMPC\_CHL\_036\_001 | v1.2

procedureMetadata

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

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**Methacholine challenge: start of 50 mg/ml MCh measurement timestamp** IMPC\_CHL\_037\_001 | v1.2

procedureMetadata

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

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**Methacholine challenge: end of 50 mg/ml MCh measurement timestamp** IMPC\_CHL\_038\_001 | v1.2

procedureMetadata

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

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**Hypoxia challenge: duration of Unchallenged measurement period** IMPC\_CHL\_028\_001 | v1.1

procedureMetadata

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

Unit Measured: min

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**Hypoxia challenge: start of Unchallenged measurement timestamp** IMPC\_CHL\_039\_001 | v1.2

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Hypoxia challenge: end of Unchallenged measurement timestamp

IMPC\_CHL\_040\_001 | v1.1

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Hypoxia challenge: duration of 10% O2 measurement period

IMPC\_CHL\_041\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Unit Measured: min

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## Hypoxia challenge: start of 10% O2 measurement timestamp

IMPC\_CHL\_042\_001 | v1.1

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Hypoxia challenge: end of 10% O2 measurement timestamp

IMPC\_CHL\_043\_001 | v1.1

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Hypoxia challenge: duration of 21% O2 measurement period

IMPC\_CHL\_044\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Unit Measured: min

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## Hypoxia challenge: start of 21% O2 measurement timestamp

IMPC\_CHL\_045\_001 | v1.1

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Hypoxia challenge: end of 21% O2 measurement timestamp

IMPC\_CHL\_046\_001 | v1.1

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Hypoxia challenge: duration of Baseline measurement period

IMPC\_CHL\_047\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Unit Measured: min

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## Hypoxia challenge: start of Baseline measurement timestamp

IMPC\_CHL\_048\_001 | v1.1

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Hypoxia challenge: end of Baseline measurement timestamp

IMPC\_CHL\_049\_001 | v1.1

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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