Challenge Whole Body Plethysmography T CP_CHL_002

Purpose

The purpose of this procedure is to record the respiratory function of mice after sensitization with an inert allergen (ovalbumin; OVA) in response to challenge with a non-allergen airway agonist (Methacholine; MCh) using unrestrained whole-body plethysmography and assess the ability of the immune system to mount an acquired Type I allergic hypersensitivity immune response (allergic airway disease).

Experimental Design

- Minimum number of animals : 6M + 6F
- Age at test: Unrestricted
- Sex: We would expect the results of this test to show sexual dimorphism

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

Sensitization:

- Day 0: administrate OVA (20 µg) + Alum (2mg) ip
- Day 7: administrate OVA (20 μg) + Alum (2mg) ip
- Day 14: administrate aerosol 2.5% OVA (40min/day)
- Day 15/16: administrate aerosol 2.5% OVA (40min/day)
- Day 17/18: administrate aerosol 2.5% OVA (40min/day)
- Day 20: administrate aerosol 2.5% OVA (40min/day)

On the day of the Whole Body Plethysmography procedure:

- 1. Transfer the cohort to be tested to the test room.
- 2. Weigh each mouse in the cohort and record weight.

- 3. Turn on amplifier, nebulizer and computer, and calibrate the equipment.
- 4. Place each mouse in the cohort in an individual plethysmograph chamber and acclimatize for 30 minutes.
- 5. Methacholine (MCh) challenge:
 - Measure and record baseline data for 5 minutes
 - Nebulize with PBS for 2 minutes
 - Measure and record response to PBS for 5 minutes
 - Nebulize with 12.5mg/ml MCh for 2 minutes
 - Measure and record response to 12.5mg/ml for 5 minutes
 - Nebulize with 25mg/ml MCh for 2 minutes
 - Measure and record response to 25mg/ml for 5 minutes
 - Nebulize with 50mg/ml MCh for 2 minutes
 - Measure and record response to 50mg/ml MCh for 5 minutes
- 6. Remove each mouse from its chamber and place back in the home cage.
- 7. Sacrifice the mouse and collect samples:
 - Whole blood by cardiac punture to prepare for serum analysis of IgE and IgG
 - Bronchoalveolar lavage (BAL) fluid into 1.5ml eppendorf tube for analysis of inflammatory cells and cytokines
 - Whole lung tissue immersion fixation in 10% NBF for histopathology

Parameters and Metadata

Body weight TCP_CHL_001_001 | v1.2

simpleParameter

Req. Analysis: false Req. Upload: true

Is Annotated: false

Unit Measured: g

Frequency of breathing (f) TCP_CHL_002_001 | v1.1

seriesParameter

Req. Analysis: false Req. Upload: true

Is Annotated: true

Unit Measured: bpm

Tidal volume (TV) TCP_CHL_003_001 | v1.1

seriesParameter

Req. Analysis: false	Req. Upload: true	Is Annotated: true
Unit Measured: ml		
Increments: Minimum 1		

Minute volume (MV) TCP_CHL_004_001 | v1.1

seriesParameter

Req. Analysis: false	Req. Upload: true	Is Annotated: true
Unit Measured: ml/min		
Increments: Minimum 1		

Peak expiratory flow (PEF) TCP_CHL_005_001 | v1.1

seriesParameter

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

Unit Measured: ml/s

Increments: Minimum 1

Peak inspiratory flow (PIF) TCP_CHL_006_001 | v1.1

seriesParameter

Req. Analysis: false	Req. Upload: true	Is Annotated: true
Unit Measured: ml/s		
Increments: Minimum 1		

Pause (PAU) TCP_CHL_007_001 | v1.1

seriesParameter

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

Unit Measured: s

Increments: Minimum 1

Inspiratory time (Ti) TCP_CHL_008_001 | v1.2

seriesParameter

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

Unit Measured: s

Increments: Minimum 1

Expiratory time (Te) TCP_CHL_009_001 | v1.1

seriesParameter

Req. Analysis: false	Req. Upload: true	Is Annotated: true
Unit Magguradu a		
Unit Measured: S		
Increments: Minimum 1		

Relaxation time (RT) TCP_CHL_010_001 | v1.1

seriesParameter

Req. Analysis: false	Req. Upload: true	Is Annotated: true
Unit Measured: s		
Increments: Minimum 1		

End-inspiratory pause (EIP) TCP_CHL_011_001 | v1.2

seriesParameter

Req. Analysis: false

Unit Measured: ml/s

Increments: Minimum 1

End-expiratory pause (EEP) TCP_CHL_012_001 | v1.2

seriesParameter

Req. Analysis: false	Req. Upload: false	Is Annotated: true
Unit Measured: ml/s		
Increments: Minimum 1		

Enhanced pause (Penh) TCP_CHL_013_001 | v1.1

seriesParameter

Req. Analysis: false	Req. Upload: true	Is Annotated: true
Unit Measured: ratio		
Increments: Minimum 1		

Rejection index (Rin) TCP_CHL_014_001 | v1.1

seriesParameter

Req. Analysis: false	Req. Upload: true	Is Annotated: true
Increments: Minimum 1		
Rpef TCP_CHL_015_001 seriesParameter	v1.1	
Req. Analysis: false	Req. Upload: true	Is Annotated: true
Increments: Minimum 1		

Delta Insp and Exp volume (dV) TCP_CHL_016_001 | v1.2

seriesParameter

Req. Analysis: false	Req. Upload: false	Is Annotated: true
Unit Measured: ml		
Increments: Minimum 1		

Flow at point 50% TV expired (EF50) TCP_CHL_017_001 | v1.1

seriesParameter

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

Increments: Minimum 1

Equipment ID TCP_CHL_018_001 | v1.0

procedureMetadata

Req. Analysis: false	Req. Upload: true	Is Annotated: false
Experimenter ID	TCP_CHL_019_001 v1.0	

procedureMetadata

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

Equipment manufacturer TCP_CHL_020_001 | v1.0

procedureMetadata

Req. Analysis: false	Req. Upload: true	Is Annotated: false
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Options: Buxco,

Equipment model TCP_CHL_021_001 | v1.0

procedureMetadata

Req. Analysis: false	Req. Upload: true	Is Annotated: false	
Options: Aerosol Delivery Sys	stem AUT 5110, Plethysmogra	oh PLY3211, FP WBP Unite,	
Software for analys	SIS TCP_CHL_022_001 v1	.0	
Req. Analysis: false	Req. Upload: true	Is Annotated: false	
Options: BioSystem XA for W	/indows v2.9.4, FinePointe Soft	ware Research Suite v2.3.1.9,	
Analysis Algorithm TCP_CHL_023_001 v1.0 procedureMetadata			
Req. Analysis: false	Req. Upload: true	Is Annotated: false	
Options: Epstein,			
Date equipment last calibrated TCP_CHL_024_001 v1.1 procedureMetadata			

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

Type of restraint TCP_CHL_025_001 | v1.0

procedureMetadata

Req. Analysis: falseReq. Upload: trueIs Annotated: false

Options: Unrestrained,

Duration of measurement of response to PBS TCP_CHL_026_0

01 | v1.2 procedureMetadata

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

Unit Measured: min

Start of measurement of response to PBS timestamp TCP_C

HL_027_001 | v1.1

procedureMetadata

Req. Analysis: falseReq. Upload: trueIs Annotated: false

End of measurement of response to PBS timestamp TCP_C

HL_028_001 | v1.1

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

Duration of 12.5 mg/ml MCh measurement TCP_CHL_029_001 | v1

procedureMetadata

.1

Req. Analysis: false	Req. Upload: true	Is Annotated: false
Unit Measured: min		

Start of 12.5 mg/ml MCh measurement timestamp TCP_CHL_

030_001 | v1.0 procedureMetadata

Req. Analysis: false	Req. Upload: true	Is Annotated: false
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End of 12.5 mg/ml MCh measurement timestamp TCP_CHL_0

31_001 | v1.0 procedureMetadata

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

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Duration of 25 mg/ml MCh measurement TCP_CHL_032_001 | v1.

3

procedureMetadata

Req. Analysis: false	Req. Upload: true	Is Annotated: false
Unit Measured: min		

Start of 25 mg/ml MCh measurement timestamp TCP_CHL_033

_001 | v1.1 procedureMetadata

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

End of 25 mg/ml MCh measurement timestamp TCP_CHL_034_

001 | v1.1 procedureMetadata

Req. Analysis: falseReq. Upload: trueIs Annotated: false

Duration of 50 mg/ml MCh measurement TCP_CHL_035_001 | v1.

1

procedureMetadata

Unit Measured: min

Start of 50 mg/ml MCh measurement timestamp TCP_CHL_036

_001 | v1.0 procedureMetadata

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

End of 50 mg/ml MCh measurement timestamp TCP_CHL_037_

001 | v1.0 procedureMetadata

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

Methacholine challenge: duration of baseline measurement period TCP_CHL_038_001 | v1.0

procedureMetadata

Req. Analysis: false Req. Upload: true

Is Annotated: false

Unit Measured: min

Methacholine challenge: start of baseline measurement

timestamp TCP_CHL_039_001 | v1.0

procedureMetadata

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

Methacholine challenge: end of baseline measurement timestamp TCP_CHL_040_001 | v1.0

procedureMetadata

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

TB (duration of breaking) TCP_CHL_041_001 | v1.0

seriesParameter

Reg. Analysis: false **Reg. Upload:** false

Is Annotated: false

Unit Measured: %

Increments: Minimum 1

TP (duration of pause) TCP_CHL_042_001 | v1.0

seriesParameter

Req. Analysis: false

Unit Measured: %

Increments: Minimum 1
