Lung mechanics by forced oscillations CCP_LFO_001

Purpose

Measurement of lung mechanical parameters which are relevant to the respiratory function of the animal

Experimental Design

Minimum number of animals: 7 mice of each sex

Age at test: 13 weeks

Sex: both sexes

Equipment

1. Scales
2. Intubation platform
3. Bend forceps
4. Modified catheter insertion needle (blunted and slightly bend)
5. Catheters: 18G, 1.16 inch
6. Catheters: 20G, 1.16 inch
7. Stopper to block tube during calibration
8. Flexivent FX
9. Computer with the Flexiware software linked to the Flexivent
10. Cold light source with Flexible light arm
11. Heating pad
12. Eye gel
13. Ketamine (10 mg/ml)/xylazine (1 mg/ml) in saline
14. Optional: Pulse-oximeter which is usable in mice

Procedure

1. Weigh and anaesthetise mouse.
2. Set up the software program and perform tube calibration.
3. Intubate the mouse.
4. Attach the tube to the ventilator port and pulse-oximeter to a hind limb where applicable.
5. Check the tube was correctly inserted by checking the PAO curve. If required reintubate the mouse.
6. Perform 2 deep inflations to check for tube leakage.
7. Ensure that the oxygen saturation is adequate as indicated by minimum oxygen level of 95% or regular PAO curve.

    1. If the saturation level is inadequate, leave the animal to be ventilated for 1 minute
    2. If this does not improve the saturation increase the breathing frequency to 250 bpm and ventilate until oxygen saturation is adequate.
8. Start the measurements.
9. The ventilation frequency should be set to 180 bpm at the start. If necessary for obtaining valid measurements increase the frequency to 250 bpm allowing the oxygen saturation levels to recover before commencing measurements.
10. After execution of the script, repeat the perturbations which were excluded by the software until there are 5 valid measurements for each perturbation.
    1. Leave at least one minute of ventilation between the end of the script and the repeats
    2. Leave at least 20 seconds between individual perturbations.
    3. Perform a deep inflation every 5 perturbations
11. Stop ventilation and ensure the animal starts breathing spontaneously and then extubate the mouse.
12. Apply eye gel on the mouse and place it on a heat pad until it starts moving. Place back in its home cage.

Parameters and Metadata

Weight CCP_LFO_001_001 | v1.0

simpleParameter

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

Unit Measured: g

Rsn CCP_LFO_002_001 | v1.0

simpleParameter

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

Unit Measured: cmH2O*s/ml

Csn CCP_LFO_003_001 | v1.0

simpleParameter

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

Unit Measured: ml/cmH2O

Esn CCP_LFO_004_001 | v1.0

simpleParameter

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

Unit Measured: cmH2O/ml

Rqp CCP_LFO_005_001 | v1.0

simpleParameter

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

Unit Measured: cmH2O*s/ml

Gqp CCP_LFO_006_001 | v1.0

simpleParameter

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

Unit Measured: cmH2O/ml

Hqp CCP_LFO_007_001 | v1.0

simpleParameter

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

Unit Measured: cmH2O/ml

Rp8 CCP_LFO_008_001 | v1.0

simpleParameter

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

Unit Measured: cmH2O*s/ml

Gp8 CCP_LFO_009_001 | v1.0

simpleParameter

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

Unit Measured: cmH2O/ml

Hp8 CCP_LFO_010_001 | v1.0

simpleParameter

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

Unit Measured: cmH2O/ml

Inspiratory capacity CCP_LFO_011_001 | v1.0

simpleParameter

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

Unit Measured: ml

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comment CCP_LFO_012_001 | v1.0

simpleParameter

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

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Anaesthetic agent and dose CCP_LFO_013_001 | v1.0

procedureMetadata

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

Options:
Ketamine/xylazine: (0.1 mg/g + 1.0 mg) / (0.01 mg/g + 0.1 mg) males; (0.1 mg/g + 0.5 mg) / (0.01 mg/g + 0.05 mg) females,

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Equipment manufacturer CCP_LFO_014_001 | v1.0

procedureMetadata

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

Options: Scireq,

Equipment model CCP_LFO_015_001 | v1.0

procedureMetadata

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

Options: Flexivent FX,

Equipment module CCP_LFO_016_001 | v1.0

procedureMetadata

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

Options: 1, 2, 3,

Software version CCP_LFO_017_001 | v1.0

procedureMetadata

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

Options: 7.6, 8.4,

Operator ID CCP_LFO_018_001 | v1.0

procedureMetadata

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

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Date of last calibration CCP_LFO_019_001 | v1.0

procedureMetadata

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

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