

Lung Function 肺功能檢測

1. Purpose

- 1.1 To examine the lung function of a mouse by using unstrained whole body plethysmography.

2. Safety Requirements

- 2.1 General laboratory procedures should be followed, which include: no eating, no chewing gum, no drinking, and no applying of cosmetics in the work area. The researcher must wear the laboratory coat, gloves and a mask during the experiment.

3. Associated Documents

- 3.1 http://www.buxco.com/products_technologies_wholebodyplethysmography.aspx

4. Notes

- 4.1 The mice must be maintained in a controlled environment with stable temperature, humidity, and air pressure. Keep minimal disturbing and stress on the tested mice whenever is possible.
- 4.2 The lung function of a mouse is age/sex/strain dependent. It is important to have the age-matched mice with the same sex and strain background in a single experiment.
- 4.3 The measurement of mouse lung function is airflow and volume dependent, so we should control atmospheric pressure stable during the experiment.
- 4.4 The Buxco chambers will be cleaned after all cases of a single user are completed.

5. Quality Control

- 5.1 Calibrate the whole body plethysmograph system before measurement.
- 5.2 Before the test, the mouse will habituate in the Buxco chamber for 15min.
- 5.3 We will avoid opening the lab door to maintain the atmospheric pressure stable.

6. Equipment

- 6.1 Unrestrained whole body plethysmograph (Buxco) chamber for mouse
- 6.2 Ponemah (signal recorder ; preamplifier)
- 6.3 Pressure transducer
- 6.4 Bias flow regulator
- 6.5 FinePointe (lung function analysis software for mouse)
- 6.6 Aerosol system for whole body plethysmograph

7. Supplies

- 7.1 Cap
- 7.2 Dry stone
- 7.3 Gloves
- 7.4 Mask
- 7.5 Ethanol 70%
- 7.6 paper towel
- 7.7 PBS

7.8 Methacholine

7.9 HOCl

8. Procedures

8.1 Turn on the computer.

8.2 Turn on the bias flow regulator, and link the tube to the Buxco chamber.

8.3 Turn on the preamplifier, and link the transducer to the Buxco chamber.

8.4 Calibrate the Buxco system with FinPointe software.

8.5 Put the mouse in the Buxco chamber to measure lung function.

8.6 The mouse is allowed to habituate in the Buxco chamber for 15min.

8.7 Spray aerosol of PBS or Methacholine for 3min (user can adjust the time).

8.8 Record respiratory data for 3min (user can adjust the recording time).

8.9 Allow a 5-min resting (or longer, depending on the mouse respiration condition) before next procedure.

8.10 Repeat steps 7-9. The order of neutralization is PBS 、Methacholine 3.125 、12.5 、25 、50 mg/ml for mouse inhalation (up to 4 different Methacholine concentrations).

8.11 Move the mice to their home cage and then clean the Buxco chamber.

P.S. The user can choose to skip or revise the steps of 7~10.

If the user wants to test the basal lung function, we propose to skip the steps of 7~10. The basal respiratory parameters will be measured for 1 hour and spray a single dose of aerosolized Methacholine (12.5 mg/ml) at the 50th min.

The researcher should avoid inhaling the aerosolized Methacholine, because it would induce asthma.

