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Hypothermia Induction in Mice

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We use this protocol and it's working

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Abstract

This protocol describes a detailed method for inducing and measuring hypothermia in mice using Etomoxir and KLH45, enabling the evaluation of pharmacological effects on thermoregulation.

Guidelines

The protocol needs prior approval by the users' Institutional Animal Care and Use Committee (IACUC) or equivalent ethics committee.

Materials

Materials:

- Etomoxir **Merck MilliporeSigma (Sigma-Aldrich) Catalog #**236020 : 30 mg/kg, dissolved in phosphate-buffered saline (PBS).
- KLH45 **Merck MilliporeSigma (Sigma-Aldrich) Catalog #**SML1998 : 40 mg/kg, dissolved in emulphor (18:1:1 saline: ethanol: Polyethylene Glycol Monooleyl Ether **Fisher Scientific Catalog #**P071325G
- Control vehicles: PBS or emulphor.

Equipments:

- Heating block or water bath for solution preparation
- Syringes and needles for intraperitoneal (IP) injection
- Rectal thermometer for mice (Kent Scientific, RET-3)
- Cage with controlled environment for post-injection monitoring

Preparation of Solutions

1 Dissolve Etomoxir in PBS to achieve the desired concentration for 30 mg/kg dosing.

2 Prepare KLH45 in emulphor composed of 18:1:1 saline: ethanol: polyethylene glycol monooleyl ether to achieve a 40 mg/kg dosing concentration.

3 Prepare control vehicles (PBS for Etomoxir and emulphor for KLH45).

Pre-Injection Procedure

4 Place mice on food restriction 3 hours prior to the injection to minimize metabolic variability.

5 Weigh each mouse to calculate the appropriate injection volume based on body weight.

Hypothermia Induction

6 Administer the following intraperitoneally (IP):

6.1 Etomoxir group: 30 mg/kg in PBS.

6.2 KLH45 group: 40 mg/kg in emulphor.

6.3 Control groups: Corresponding vehicle (PBS or emulphor).

7 Ensure proper injection technique to avoid discomfort or improper dosing.

Body Temperature Measurement

8 Measure the baseline body temperature (Tb) of each mouse using a rectal probe.

9 Record body temperature at the following time points post-injection: 0 hour (immediately after injection), 0.5 hour, 1 hour, and 3 hours.

Post-Injection Monitoring

10 Return the mice to their cages immediately after injection.

11 Ensure the mice are housed without access to feed during the post-injection monitoring period.

12 Monitor for any signs of distress or abnormal behavior during the experiment.

Data Recording

13 Record all temperature measurements and note any significant changes or observations during the experiment.

14 Analyze temperature data to assess the hypothermic response induced by the treatments.

Note

- Ensure accurate dosing by calibrating the syringe and needle prior to injection.
- Use sterile techniques when preparing solutions and administering injections.
- Mice should be handled gently to minimize stress, which can influence body temperature measurements.
- Include adequate sample size and control groups for statistical reliability.