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Oral exposures for the assessment of GI function in mice

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Alexandria White¹

¹Emory University



Alexandria White

Emory University

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We use this protocol and it's working

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All animal husbandry and experimental procedures were performed in accordance with Emory's Institutional Animal Care and Use Committee (IACUC) protocol #201900030.

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Abstract

This protocol is intended for the oral or intragastric administration of the pyrethroid insecticide deltamethrin followed by a mixed-meal nutrient stimulus for the assessment of gastrointestinal function after toxicant exposure in mice. The toxicant, vehicle, dose, or dose volume can be adjusted as needed.

Deltamethrin gavage

- 1 One day prior to gavage, prepare deltamethrin in a corn oil vehicle to achieve a dosage of 3 mg/kg body weight, as follows.
 - 1.1 For example:
Avg. mouse weight: 30g
Desired dose: 3 mg/kg
Desired dose volume: 50 uL

Convert 3 mg/kg to ug/g: $3 \text{ ug/g} \times 30 \text{ g mouse weight} = 90 \text{ ug}$
90 ug deltamethrin per 50 uL dose = 1.8 ug/uL

Convert back to mg/mL: 1.8 mg deltamethrin per mL corn oil vehicle needed.
 - 1.2 Weigh 1.8 mg (or more, as needed) deltamethrin, add to a 4mL glass vial, and add 50 uL pure acetone to facilitate dissolution. Vortex thoroughly.
 - 1.3 Once deltamethrin is fully dissolved in acetone, add the appropriate volume of filter-sterilized corn oil. Prepare as much as necessary according to the amount of mice being treated.
 - 1.4 Place the vials (including the vehicle control vial, which should consist only of 50 uL acetone and corn oil) under a chemical fume hood with the caps off to allow the acetone to evaporate overnight.
 - 1.5 The next day, the deltamethrin and vehicle preparations will be ready for oral gavage.
- 2 Using a sterilized 22G metal (not plastic, which can absorb deltamethrin) feeding needle, gently gavage mice intragastrically with 50 uL deltamethrin solution or vehicle control. Ensure that different gavage needles are used for each treatment group.
 - 2.1 Optional: if performing acute exposure assessments (<24h), stagger the gavage time by ~7-8 minute intervals (the approximate time it takes to perfuse 1 mouse) to ensure precision in the exposure period between gavage and sacrifice. This is especially important if interested in gastrointestinal (GI) function.
 - 2.2 Observe mice periodically after gavage for signs of acute toxicity.

Optional mixed-meal nutrient stimulus gavage



- 3 Prepare mixed-meal nutrient stimulus mixture as follows.
 - 3.1 Dissolve carmine red powder into Ensure (Abbott Pharmaceuticals) nutrient drink to achieve 6% carmine. Ex.) 600 mg carmine into 10 mL Ensure. Vortex thoroughly. Note: the addition of carmine red dye is optional but allows visualization and measurement of gastrointestinal motility upon sacrifice.
- 4 To ensure accurate measurements of GI function and status, fast the animals for 4-6h prior to gavage with the mixed-meal nutrient stimulus.
- 5 Gavage mice with 100 uL of the mixed-meal nutrient mixture using a plastic feeding needle, staggering the gavages every ~7-8 minutes for each mouse.