VIRGINIA TECH

UNIVERSITY VETERINARIAN & ANIMAL RESOURCES

SOP: Oral Gavage in the Rat

These SOPs were developed by the Office of the University Veterinarian and reviewed by Virginia Tech IACUC to provide a reference and guidance to investigators during protocol preparation and IACUC reviewers during protocol review. They can be used as referenced descriptions for procedures on IACUC protocols. However, it is the sole responsibility of the Principal Investigator to ensure that the referenced SOPs adequately cover and accurately represent procedures to be undertaken in any research project. Any modification to procedure as described in the SOP must be outlined in each IACUC protocol application (e.g. if the Principal Investigator plans to use a needle size that is not referenced in the SOP, simply state that alteration in the IACUC protocol itself).

Table of Contents

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I. Procedure Summary and Goal

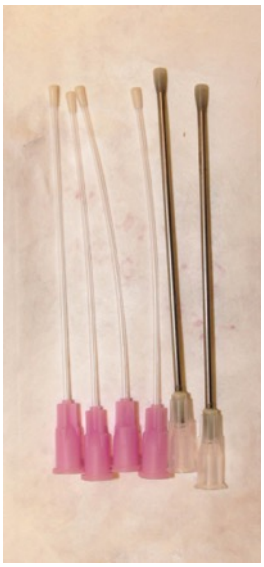
Describes the procedure for the administration of fluids directly into the stomach through the use of a standard gavage needle (or feeding needle) introduced into the mouth and threaded down the esophagus.

Considerations

1. With proper training, this method is performed easily and quickly with minimal distress to the animal. Firm manual restraint with immobilization of the head is necessary.
2. The position of the rat is very important. Align the head and body vertically with the esophagus.
3. Never force the feeding needle down, allowing the rat to swallow and gravity to assist.
4. Always administer the compound slowly and finish administering *before* pulling gavage needle out. Always pull needle straight out. Do Not Aspirate!
5. STOP the procedure if mucous membranes are blue, the animal struggles vigorously, or fluid comes from the nose.
6. Precoating the gavage needle with sucrose has been demonstrated to decrease stress-related reactions and thereby improve animal welfare during oral gavage.(J Am Assoc Lab Anim Sci. 2010 May;49(3):329-34)

II. Personal Protective Equipment (PPE) and Hygiene

a. Ensure appropriate PPE is used to protect technician from accidental exposure to blood and other body fluids, such as:
   i. Gloves
   ii. Eye protection
   iii. Mask
   iv. Other PPE as required by protocol/facility
b. Hands should be washed and/or gloves changed between animals.
c. Promptly dispose of used sharps in the provided leak-proof, puncture resistant sharps container.



III. Supply List

a. Prefilled syringes
b. Gavage needles (Figure 1)
   i. Reusable: stainless steel (ball tip, shaft, and hub)
   ii. Single-use: silicone ball tip, stainless steel shaft, plastic hub

Figure 1. Gavage Needles

IV. Detailed Procedure

a. Frequency and Volume

i. Volume: Up to 20 ml/kg

ii. Dosing can be repeated up to three times in a 24 hour period

a) If additional dosing is necessary, it must be justified in the animal use protocol.

b. Anesthesia

i. General anesthesia is not recommended and may interfere with gastric emptying.

c. Procedure

i. Select the appropriate sized gavage needle based upon weight and size of animal (Figure 2).

Weight (gms)	Gauge	Length (inch)	Ball diameter (mm)	Shape
50-75	20	1-3	1.9-2.25	Straight or Curved
75-120	18	1 - 1.5	2.0-2.25	Straight or Curved
100-200	18	2 - 3.1	2.0-2.3	Straight or Curved
100-200	17	1 - 3.3	2.4	Straight or Curved
100-200	16	2 - 3	3	Straight or Curved
150-300	16 - 15	3 - 4	2.8-3.0	Straight or Curved
200-350	14 - 13	3 - 5	2.9-4.0	Straight or Curved

Figure 2. Suggested gavage needle sizes for rats (as listed in Braintree Scientific Catalog)

ii. Place the gavage needle along the lateral aspect of the animal so that the ball tip of the gavage needle is adjacent to the last rib. Note where the shaft of the needle lines up with incisors to determine how far needle can be safely advanced (Figure 3).

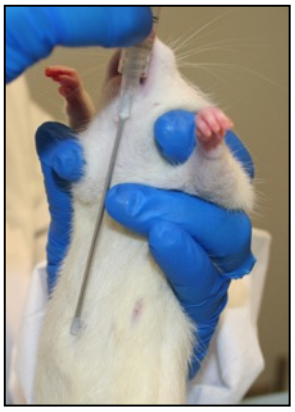


Figure 3. Measuring the Gavage Needle

iii. To restrain, securely scruff the animal and hold its head up with the longitudinal axis of the body in a vertical position; animal should face handler with head immobilized. This position allows gravity to assist in preventing reflux of the material being administered (Figure 4).

iv. Insert the gavage needle into the mouth and direct over the tongue and into the pharynx. Slightly hyperextending the animal's head back will facilitate entry of the gavage needle into the esophagus (Figures 5 and 6).

a) The animal will swallow by reflex when the pharynx is entered and the needle should easily slide into the esophagus with minimum pressure. Do not force.

b) The ball tip should prevent gavage needle from entering the trachea, but if animal gasps, remove needle into oral cavity and repeat procedure of passing the needle over the tongue.

v. If animal breathes without struggling, administer amount of material slowly and smoothly.

vi. Once administration completed, pull gavage needle straight out.

vii. Return the animal to the cage and monitor for 5-10 minutes.

a) Observe for signs of labored breathing or distress

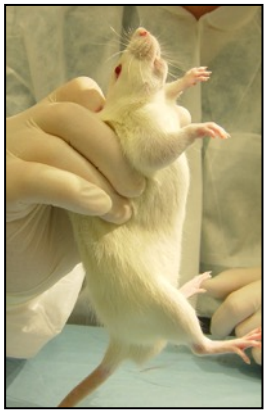


Figure 4. Restraint

Figure 5. Introducing the Gavage Needle

Figure 6. Insertion, Straightening Position

Figure 7. Ready for Administration

V. Variations

None

VI. Potential Adverse Effects, Mitigation, or Treatment

a. Tracheal administration

i. Stop administration of substance, remove gavage needle

ii. Contact veterinary personnel immediately

b. Reflux, aspiration and/or respiratory distress

i. Stop administration of substance, remove gavage needle

ii. Contact veterinary personnel immediately

c. Pharyngeal, esophageal, gastric irritation, injury or rupture

i. Contact veterinary personnel immediately

d. Death

VII. References

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