

## TAIL VEIN INJECTION (SOP-7)

### INTRODUCTION

Several techniques can be employed which allow for repeated intravenous administration of a drug or other experimental compound. Permanent cannulation of major veins is one such method, but it requires a surgical procedure which is relatively time consuming, and which compromises a significant stress, elevating catecholamine and corticosteroid levels. Described below is a method which is relatively quick and simple. This technique enables repeated infusion of fluids intravenously and is not very stressful. It can be performed on animals (rats or mice) which are appropriately passively restrained or lightly anesthetized.

### SUPPLIES

Metafane™ (methoxyflurane) or (device/ holder for passive restraint)  
Glass dessicator  
Gauze pads  
Paper towels  
50 ml beaker  
Cotton tipped applicators  
Tuberculin 1 cc syringe  
27-22 gauge 5/8 inch needles (depending on size of animal)  
1500 ml beaker and hot plate (or heat lamp)

### PROCEDURE

1. Anesthetize animals with Metafane™. If injection of unanesthetized animals is required, the animal is placed in an appropriate passive restraint device (e.g. tunnel restrainer).
2. Place the tail in large beaker filled with warm water (40°C) for 30 seconds. Alternately, the tail can be warmed under a heat lamp. Warming the tail causes the veins to dilate.
3. Locate the right or left tail vein on the lateral aspects of the tail. Hold the tail between the thumb and index finger, with the index finger positioned underneath the tail. Insert the needle (bevel up) into the skin directly over the vein where the tail bends over the forefinger. The tail vein lies in a sheath of muscle and connective tissue, so the needle should glide smoothly with minimal resistance as it passes into the vein.
4. If repeated injections will be made, the injection should be as distally as practicable as the vein may collapse or be otherwise damaged by the injection procedure. Alternate veins (i.e., right and left) for each consecutive dose.
5. A 27-25 g needle is appropriate for mice and young rats. The tail skin is tough on older rats and the vessels are larger, therefore a larger needle, up to 22 g, may be used. To facilitate injection, the tail scale may be removed by scraping against the grain with a scalpel blade or tongue depressor. Where necessary, this should be done a day or two before

- veinpuncture as it may cause enough local irritation to obscure the underlying vessels.
6. To assure proper placement of the needle, in larger rats a small amount of blood may be aspirated into the syringes. In mice and immature rats, aspiration will often reveal no blood, even when the needle is appropriately placed. However, upon injection, the vessel will blanch and the solution will flow readily if the needle is located within the vein. If the injection is placed subcutaneously, the tail may also blanch but the resistance to injection will be much higher and there will be some degree of local swelling at the injection site.
  7. Small injection volumes are preferred, and should not exceed 0.2 ml in the mouse or 0.5 ml in adult rats. When the dose has been administered, slowly remove the needle and apply light pressure to the injection site with a sterile cotton swab or gauze sponge.
  8. Remove the animal from the restraint or monitor the animal for recovery from the effects of anesthesia.