

LABORATORY ANIMAL BIOMETHODOLOGY WORKSHOP

THE LABORATORY MOUSE

INTRAVENOUS TAIL INJECTION

1. Substance

- Solutions should be isotonic (same tonicity as blood; 280–310 mosm/L). Non-isotonic solutions must be injected slowly.
- Warm the solutions to body temperature (or at least room temperature) immediately prior to administration, if possible.
- Verify the solubility of the substance. Precipitation may cause the formation of large particles.
- Inject separate substances at different sites to avoid cross reaction of chemicals.
- Avoid injecting highly viscous liquids as they can cause discomfort and require a larger needle size for injection.
- Substances to be injected must be sterile as contamination can lead to infection or irritation of the injection site. Sterilize solutions by autoclaving or microfiltration and use aseptic technique for injection.

2. Injections

- Injection sites: lateral tail vein (Figure 1)
- Remove air bubbles and air pockets prior to injection.
- Do not inject into inflamed or damaged tissue.
- Alternate the injection sites, if possible.
- Limit the number of punctures to 5 per site, per day.
- Limit the number of puncture attempts to 3. After 3 unsuccessful attempts, request the assistance of another trained person.
- For continuous infusion, indwelling catheters may be surgically implanted.
- Administer injections at a constant flow rate.

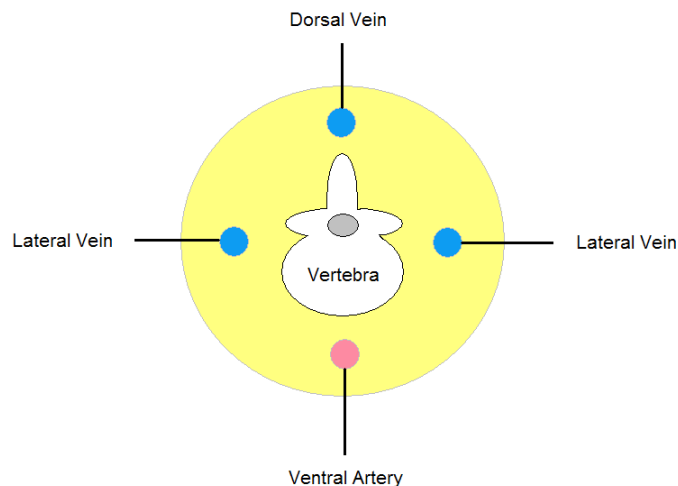


Figure 1

3. Needles

- Always use sharp needles.
- Use the smallest gauge of needle possible that allows accurate injection of the substance.
- Recommended needle sizes (gauge): 26-30 G

4. Volume for Substance Administration

- Use the smallest possible volume for injection.
- Recommended volumes for substance administration:
 - Intravenous bolus: 0-5 ml/kg
 - Intravenous slow injection: 25 ml/kg
- If the volume administered must exceed the recommended volumes listed above, justification must be provided and will require approval by the FACC.

5. Procedure:

- Weigh the animal and calculate the optimal volume for administration.
- Choose the adequate gauge of needle.
- Induce peripheral vasodilatation:
 - Warm the animal 5 to 10 minutes prior to injection in order to dilate the veins. Care should be taken not to overheat the animals.
 - Ex: red heat lamp (at a distance of 2-3 feet for a 250W bulb), tail dipped into warm water (110 °F or 43°C)
 - Administer vasodilating agents.
 - Ex. acepromazine: 0.5-.075 mg/kg administered subcutaneously 20 minutes prior to intravenous injection
- Animals must be placed in a restraining device in sternal position. (Figure 2)
- With your non-dominant hand, grasp the cranial part of the tail with your index and middle finger and grasp the distal part of the tail with your thumb and ring fingers, below the injection site. Apply gentle pressure at the cranial end of the tail in order to stabilize the tail and raise the veins.
- Slightly rotate the tail to visualize the lateral vein. The veins are located superficially (Figure 3).



Figure 2



Figure 3

- Apply alcohol to the injection site..
- Insert the needle, bevel facing up, into the vein. Maintaining the needle and syringe parallel to the tail. (Figure 4).
- Once the needle is correctly placed, you may or may not see a flash of blood in the needle hub.
- Proper placement can also be confirmed if you are able to advance the needle smoothly into the vein without any resistance.
- Release the pressure on the distal portion of the tail and inject the substance (Figure 5). The fluid will flow easily and clear the vein as it temporarily displaces the blood.
- If resistance is felt while injecting, it is likely due to incorrect placement of the needle. The fluid will not flow through the vein but will cause a bleb or blanching at the injection site. This is a perivascular injection. In this instance, stop the procedure, remove the needle and re-insert it proximal to the previous injection site.
- In case of perivascular injection, monitor the animal closely as tissue necrosis can occur at the injection site.
- Once the substance administration is complete, remove the needle and apply pressure with a clean gauze to stop bleeding.

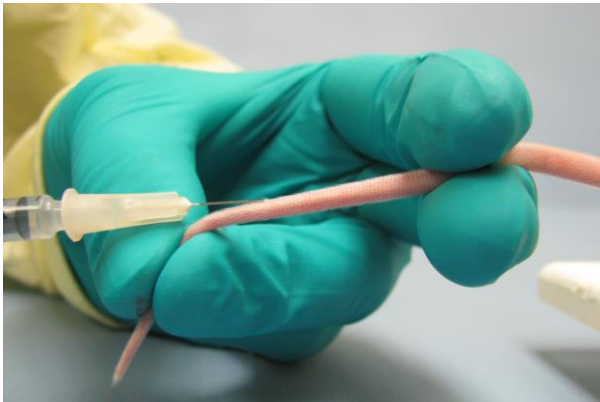


Figure 4



Figure 5