Common Laboratory Techniques- Blood withdrawal

Blood withdrawal is a common laboratory technique used in pharmacological research to collect blood samples from rats and mice for various analyses. This procedure must be performed with care to ensure the well-being of the animals and the accuracy of the samples.

1. Preparation

Equipment: Sterile syringes, needles, collection tubes, antiseptic wipes, and anesthesia (if required).

Animal Handling: Ensure the animal is calm and properly restrained to minimize stress and movement. Use appropriate restraint devices or manual restraint techniques.

2. Sites for Blood Withdrawal

Rats:

Lateral Tail Vein: Commonly used for small volume blood collection. The tail is warmed to dilate the vein, and a needle is inserted into the lateral tail vein.

Saphenous Vein: Located on the hind leg, this site is used for moderate volume collection. The leg is shaved, and the vein is punctured with a needle.

Retro-Orbital Sinus: Used for larger volume collection under anesthesia. A capillary tube is inserted into the retro-orbital sinus behind the eye.

Mice:

Lateral Tail Vein: Similar to rats, the tail is warmed, and a needle is inserted into the lateral tail vein.

Saphenous Vein: The hind leg is shaved, and the vein is punctured with a needle for moderate volume collection.

Submandibular Vein: Located under the jaw, this site allows for quick and relatively large volume collection. A lancet is used to puncture the vein.

3. Procedure

Anesthesia: Depending on the volume of blood required and the site of collection, anesthesia may be used to minimize pain and stress. Isoflurane or injectable anesthetics are commonly used.

Blood Collection:

- Sterilization: Clean the collection site with antiseptic wipes to prevent infection.

- Needle Insertion: Insert the needle or lancet into the chosen vein with a steady hand. For tail vein collection, ensure the tail is properly immobilized.
- Blood Withdrawal: Gently draw the required volume of blood into the syringe or collection tube. Avoid excessive suction to prevent vein collapse.
- Post-Collection Care: Apply gentle pressure to the puncture site to stop bleeding. Monitor the animal for any signs of distress or complications.

4. Volume of Blood Collection

Rats: Typically, up to 10% of the total blood volume can be safely collected at one time. For a 250g rat, this is approximately 1.5-2.5 ml.

Mice: Up to 10% of the total blood volume can be collected. For a 25g mouse, this is approximately 0.2-0.3 ml.

5. Post-Procedure Care

Observation: Monitor the animal for any signs of distress, bleeding, or infection. Ensure the animal is fully recovered from anesthesia before returning it to its cage.

Hydration and Nutrition: Provide fresh water and food to help the animal recover from the procedure. Consider offering a high-calorie supplement if a large volume of blood was collected.

Record Keeping: Document the procedure, including the volume of blood collected, the site of collection, and any observations about the animal's condition.