



## CM SOP #208 – Blood Collection in Mice and Rats

Original release date: 10/14/2016    Version: 5    Date last revised: 03/29/2026

### I. Purpose & Scope

The purpose of this Standard Operating Procedure (SOP) is to establish standardized methods for the safe, humane, and consistent collection of blood from mice and rats housed in Comparative Medicine (CM) facilities.

Blood collection procedures are performed for:

- Animal health monitoring
- Quarantine and health status determination
- Diagnostic testing
- Approved research procedures

This SOP applies to all personnel performing survival and terminal blood collection procedures in rodents under approved IACUC protocols or under the direction of veterinary staff for animal health-related purposes.

The goals of this SOP are to:

- Ensure humane treatment of animals
- Minimize pain, distress, and tissue trauma
- Prevent excessive blood loss or complications
- Promote consistent technique across campuses

### II. Roles & Responsibilities

#### Comparative Medicine Staff

- Performing blood collection procedures according to this SOP and approved protocols
- Using appropriate restraint and aseptic technique
- Monitoring animals following blood collection
- Documenting procedures and observations accurately
- Reporting complications or adverse events immediately
- Veterinary staff may perform blood collection for:
  - Quarantine
  - Health monitoring
  - Diagnostic testing
  - Animal welfare evaluation

#### Research Staff, Students, Visitors

- Performing blood collection only after documented training and competency
- Following approved IACUC protocol procedures
- Using appropriate blood collection volumes and techniques
- Monitoring animals after procedures
- Maintaining accurate experimental records



- Research personnel must consult veterinary staff before:
  - Collecting large blood volumes
  - Performing repeated sampling
  - Using unfamiliar collection techniques
  - Observing complications

#### CM Management

- Ensuring personnel receive appropriate training and competency assessment
- Maintaining documentation of training records
- Ensuring equipment and supplies are available
- Monitoring compliance with this SOP

#### CM Director and AV

- Providing veterinary oversight of blood collection practices
- Establishing acceptable blood collection limits and frequencies
- Serving as a resource for blood collection technique selection
- Determining appropriate response to complications
- Ensuring compliance with animal welfare standards
- The Attending Veterinarian has final authority regarding:
  - Maximum allowable blood collection volumes
  - Clinical decisions
  - Humane endpoints

### III. General Notes & Definitions

- The method of blood collection depends on:
  - Species
  - Size of the animal
  - Volume required
  - Frequency of sampling
  - Health status
  - Personnel training and experience
- All blood collection procedures must be:
  - Described in the approved IACUC protocol
  - Performed using appropriate restraint
  - Conducted using aseptic technique
- Cardiac puncture is permitted only for terminal procedures and must be performed under a deep surgical plane of anesthesia.

#### Blood Volume Guidance

- Personnel must follow FAU Guidelines of Rodent Survival Blood Collection
- General guidance:
  - Up to 10% of circulating blood volume may be collected at one time
  - Larger volumes require veterinary consultation and IACUC approval
  - Repeated sampling requires recovery intervals
- When more than 10% of blood volume is collected, SC fluid replacement is required.
- Recommended fluid replacement:
  - Warmed 0.9% saline
  - Lactated Ringer's solution
  - Typical volume: 0.25 mL to 1 mL per animal



- CAUTION: Fluids must not exceed approximately 99°F prior to administration.
- Important Physiologic Consideration
  - Rodents have high platelet counts.
  - Blood samples may clot rapidly.
  - Use EDTA-coated syringes or tubes when appropriate.

#### IV. Materials & Equipment

- Sterile syringes
- Sterile needles or lancets
- Microcapillary tubes
- Blood collection tubes
- Alcohol swabs (70%)
- Gauze
- Ophthalmic ointment
- Vaseline or Puralube
- Animal restraint devices
- Clippers
- Tail warming device or warm water
- Heating device
- Sharps container
- Personal protective equipment
- Health monitoring cards
- Experimental health monitoring sheet

#### V. Procedure

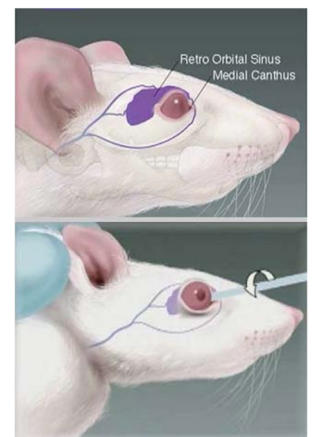
##### General Preparation

1. Verify that the blood collection method is approved in the IACUC protocol.
2. Confirm the animal identification.
3. Determine required blood volume.
4. Prepare all equipment before restraining the animal.
5. Ensure appropriate restraint device is available.
6. Wear required personal protective equipment.
7. Use aseptic technique throughout the procedure.

##### Survival Blood Collection — Mouse

###### A. Retro-Orbital Sinus Bleed

1. General anesthesia is REQUIRED.
2. Anesthetize the animal according to the approved protocol.
3. Place the mouse in lateral recumbency.
4. Apply gentle pressure to position the eye slightly protruded.
5. Inspect the capillary tube for defects.
6. Insert the capillary tube into the medial or lateral canthus at approximately a 45-degree angle (see Figure).
7. Rotate the tube gently until blood flow begins.
8. Collect the required volume.
9. Remove the tube carefully.
10. Apply gentle pressure to the closed eyelid using gauze.



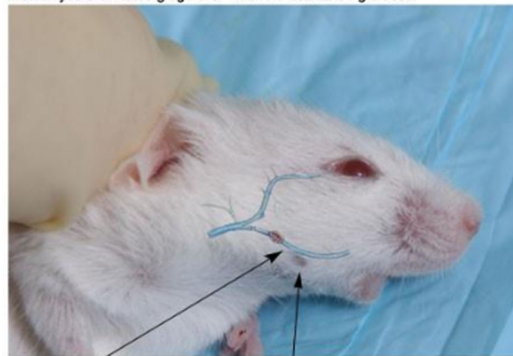


11. Apply ophthalmic ointment to protect the cornea.
12. Return the animal to its cage and monitor the animal until fully recovered.
13. Place a Health Monitoring card on the cage.
14. Recheck the animal daily for three days.
15. Immediately notify veterinary staff if any if any of the following are observed:
  - a) Swelling
  - b) Discharge
  - c) Ocular damage
  - d) Vision impairment

B. Submandibular (Facial) Vein Collection

1. Restrain the mouse securely by pinching the scruff of the neck with your thumb and forefinger, while grasping the tail between the pinkie and ring fingers. Eyes should be slightly bulging during scruff pinch to increase blood flow to the blood collection site.
2. Identify the puncture site behind the jaw, as shown below.

Note: Eyes are not bulging here. Risk of not obtaining blood.



Facial Vein. Your target blood vessel, running just along the bottom of the mandible (jaw).  
Freckle. Easily seen on white mice, also visible on dark mice.

3. Use the appropriate lancet size:
  - a) 4 mm — 3-4 week old mice
  - b) 5 mm — adult mice
4. Pierce the skin quickly and firmly.
5. Collect blood into the collection tube, then relax the restraint grip.
6. Apply pressure to the puncture site.
7. Return the mouse to its cage.
8. Monitor for bleeding.

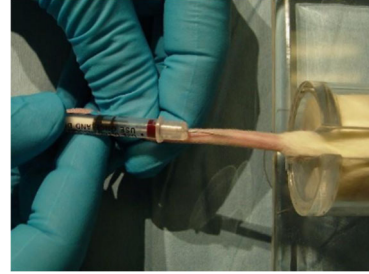
C. Lateral Saphenous Vein Collection

1. Place the mouse into an approved restraint device.
2. Extend the hind limb as shown to the right.
3. Remove hair using clippers or gentle plucking.
4. Clean the site using alcohol.
5. Apply a small amount of Vaseline or Puralube.
6. Puncture the vein using a 23-25 gauge needle or lancet.
7. Collect blood using a capillary tube.
8. Apply pressure to the site until bleeding stops.
9. Return the mouse to its cage.
10. Monitor the site for continued bleeding.

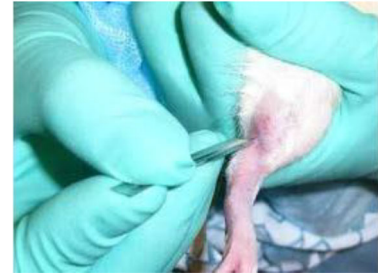


**D. Lateral Tail Vein Collection**

1. Place the mouse into a restraint device.
2. Warm the tail to promote vasodilation.
3. Clean the tail using alcohol.
4. Insert a 25–30 gauge needle into the vein.
5. Aspirate blood slowly.
6. Remove the needle.
7. Apply pressure until bleeding stops.
8. Return the mouse to its cage.
9. Monitor for complications.

**Survival Blood Collection — Rat****A. Lateral Saphenous Vein**

1. Restrain the rat with either isoflurane anesthesia, or by securely wrapping them in a towel.
2. Extend the back leg by grasping the dorsal thigh.
3. Shave or pluck hair over the vein.
4. Clean the site with alcohol.
5. Apply a small amount of Vaseline or Puralube.
6. Apply gentle pressure above the stifle.
7. Insert a 22 gauge needle at an approximately 45-degree angle.
8. Collect the required volume.
9. Apply pressure to the site.
10. Monitor the animal for bleeding.

**B. Lateral Tail Vein**

1. Place the rat into a restraint device.
2. Warm the tail to dilate the vein.
3. Clean the tail using alcohol.
4. Insert a 24–25 gauge needle.
5. Collect blood slowly.
6. Apply pressure to the puncture site.
7. Monitor the animal for bleeding.

**Post-Procedural Monitoring**

1. Observe animals for:
  - a) Bleeding
  - b) Labored breathing
  - c) Discharge
  - d) Hunched posture
  - e) Lethargy
  - f) Minimal responsiveness
  - g) Excessive licking or biting
2. Animals receiving large blood draws may appear sluggish for up to 20 minutes
3. Continuous observation is required.
4. Contact veterinary staff immediately if abnormal signs persist beyond approximately 30 minutes.

**Terminal Blood Collection**

- A. Cardiac Puncture is permitted only for terminal procedures.



1. The animal must be:
  - a) Under deep surgical anesthesia
  - b) Unresponsive to toe pinch
  - c) Without palpebral reflex
- B. Mouse or Rat
  1. Place the anesthetized animal in dorsal recumbency.
  2. Insert a 22–25 gauge needle attached to a 1–3 mL (mouse) or 3–5 mL (rat) syringe under the xiphoid process slightly left of midline.
  3. Advance the needle at a 20–30-degree angle.
  4. Aspirate gently until blood is obtained.
  5. Withdraw blood slowly.
  6. Immediately perform an approved euthanasia method.
- C. If insufficient blood is obtained:
  1. Perform euthanasia
  2. Then collect blood via thoracotomy.



### Recordkeeping

- Personnel must document:
  - Animal identification
  - Date and time
  - Blood collection method
  - Volume collected
  - Observations
  - Complications
- Documentation must be recorded in:
  - Experimental logbooks
  - Health monitoring sheets
  - Veterinary medical records
  - Diagnostic testing documentation

### VI. Health & Safety

- Personnel must:
  - Wear appropriate PPE according to SOP 101
  - Use proper restraint techniques
  - Dispose of sharps immediately
  - Never recap needles
  - Wash hands before and after procedures
- Blood collection procedures using inhalant anesthesia must be performed:
  - Under an externally vented hood, or
  - Using a vaporizer with scavenging system
- Whenever possible, procedures should be performed:
  - In a ventilated hood, or
  - Cage changing station
- Bite or Scratch Response
  - Wash the wound immediately with soap and water for 5–10 minutes.
  - Apply pressure to control bleeding.
  - Notify supervisor immediately.



- Follow procedures in *CM SOP 008: Reporting Workplace Accident, Injury, or Illness.*

### VII. References & Attachments

- *Guide for the Care and Use of Laboratory Animals*
- FAU Guidelines of Rodent Survival Blood Collection
- Rodent Handling and Restraint SOP
- Blood Volume Calculation Guide
- Health Monitoring Card

### VIII. Revision History

Revision Date	Revision Number	Summary of Changes
04/27/2020	2	No changes
10/21/2020	3	Included upper limit for IV fluid temperature
05/29/2023	4	Add statement regarding platelets and using EDTA. Change gauge recommendations of facial vein collection.
03/29/2026	5	Updated format, made ADA compliant, streamlined language and processes, updated pictures

Approved by: Nicole R. Compo, DVM, DVSc, DACLAM, Attending Veterinarian