

INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE (IACUC)

Guidelines for Blood Collection in the Rat

The following information represents MGH IACUC-approved general laboratory guidelines for blood collection in rats.

1. Too much blood collected at any one time may cause hypovolemic shock, physiological stress and even death. If small volumes are collected too frequently, anemia can result.
2. Generally, 15% of the total blood volume can be collected at one time every 2-4 weeks or 1% of the total blood volume can be collected at intervals of 24 hours or more. Total blood volume can be calculated as approximately 6% of the animal's body weight.
3. The estimated volume at exsanguination is approximately half of the total blood volume.

EXAMPLE

Average Adult Weight	Total Blood Volume	Maximum Sample Every 2-4 Weeks	Maximum Sample Every 24 h	Estimated Exsanguination Volume
300 grams	18.0 ml	2.70 ml	0.18 ml	9.0 ml

4. Important considerations when collecting blood
 - To improve vasodilation effects in rodents, it is helpful to warm the entire animal.
 - Collect the minimum amount of blood necessary.
 - The choice of anesthetics is an important consideration when collecting blood from rodents due to physiologic effects of the anesthetic. Consult with your [facility veterinarian](#).
5. The following table provides information on the collection sites available for use.

- Consult with your [facility veterinarian](#) for advice on the best site to use for your experimental model.
- Training is available if you are not experienced in blood collection techniques. Contact your [facility veterinarian](#) for more information.
- IACUC Pre-approved Procedure Form templates are available for many of these techniques and describe how these techniques are to be performed. These pre-approved forms are available in the Procedure Form Bank in Insight and can easily be incorporated into your IACUC protocol in Insight. For more information consult the Instruction section for the Procedure Form in Insight. To preview the Procedure Bank Forms available, navigate to the [Standard Procedure Form](#) section of IACUC Web site.

Collection Site	Advantages	Disadvantages
Lateral tail vein	<ul style="list-style-type: none"> • Anesthesia not required • Vein is easily accessed • Yields moderate quantities 	<ul style="list-style-type: none"> • Must be securely restrained • Some specialized equipment needed
Ventral Tail Artery	<ul style="list-style-type: none"> • Large volumes of blood can be collected 	<ul style="list-style-type: none"> • Anesthesia is required • Requires training
Orbital Sinus or Plexus	<ul style="list-style-type: none"> • Large volumes of blood can be collected 	<ul style="list-style-type: none"> • Anesthesia is required • Requires training
Lateral Saphenous Vein (demonstration of procedure)	<ul style="list-style-type: none"> • Anesthesia not required • Excellent technique for serial blood sampling • Moderate volume of blood can be collected 	<ul style="list-style-type: none"> • Requires some specialized training • Some specialized equipment required
Cardiac Puncture	<ul style="list-style-type: none"> • Maximum volume of blood can be collected 	<ul style="list-style-type: none"> • Requires deep anesthesia. • Non-survival procedure only

If you have questions or comments about any of the above techniques, contact your [facility veterinarian](#)