

Institutional Animal Care and Use Committee		UNTHSC
Title: Tail Biopsy of Mice and Rats		
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A. BACKGROUND INFORMATION

- a. There are times when a tail biopsy is needed, especially as a method for detecting the genotype of a genetically modified animal through the analysis of DNA from the tail biopsy. This SOP is intended to provide guidance when performing this procedure.

B. RESPONSIBILITIES

- a. It is the responsibility of all personnel at the University of North Texas Health Science Center using animals in research and teaching to ensure that tail biopsies of mice/rats meet the standards outlined below, when permitted in the approved IACUC protocol.
- b. It is the responsibility of the IACUC to review for approval properly justified requests for an exception to this policy.

C. PROCEDURES

- a. Only the minimum amount of tissue necessary for analysis should be taken.
- b. Tail clipping is not considered a surgical procedure. Because it is not a surgical procedure:
 - i. 70% ethanol/isopropanol can be used to wipe down the tail.
 - ii. Instruments must be sharp, sterile or disinfected and clean of visible debris. As a minimum, instruments must be wiped down with 70% ethanol/isopropanol, unless a stronger disinfectant is used. Ideal methods of sterilizing/disinfecting instruments include exposure to autoclave, glass bead sterilizer, or chemical disinfectants.
- c. Bleeding from the sampling site may stop spontaneously, however if required, adequate hemostasis must be achieved via a styptic pen, silver nitrate, tissue adhesive, gauze, cotton ball, etc.
- d. The investigator should be aware that handling pre-weanling rodent pups may lead to rejection by the dam in some cases; therefore, investigators may want to consider performing tail biopsies after the weaning period.
- e. Recent data indicates that significant ossification of the distal end of the tail occurs by post-partum day 21.
 - i. For pre-weaning animals (<21 days of age), the use of anesthesia is suggested.
 - ii. For mice 21 days or older, the use of anesthesia is required, unless justified in the protocol, or otherwise approved by the IACUC.
 - iii. For rats > 21 days of age, the use of local or general anesthesia is required, unless justified in the protocol, or otherwise approved by the IACUC.

- iv. For rats >35 days of age, general anesthesia is required
- f. Analgesia/anesthesia is NOT required when:
 - i. Animal is <21 days old and 5 mm or less of tail is biopsied.
- g. Only one biopsy sample per animal should be performed unless it is scientifically justified and approved.
- h. Other less invasive alternatives may be considered in lieu of tail biopsy. Examples of alternatives are small ear punch, small quantity of blood from distal veins (e.g., saphenous vein), and PCR analyses using saliva or hair.
- i. Scientific justification is required when:
 - i. Analgesia/anesthesia cannot be provided and the rodent is ≥ 21 day old.
 - ii. Anesthesia/analgesia cannot be used when the sample is >5 mm.
 - iii. Sample is >5 mm.
 - iv. More than one biopsy is needed for each animal.
 - v. Other less invasive procedures cannot be used.

D. REFERENCES

- a. [Hankenson F. Claire, Laura M. Garzel, David D. Fischer, Bonnie Nolan and Kurt D. Hankenson. "Evaluation of Tail Biopsy Collection in Laboratory Mice \(*Mus musculus*\): Vertebral Ossification, DNA Quantity, and Acute Behavioral Responses." *Journal of the American Association for Laboratory Animal Science* 47.6 \(2008\): 10-18.](#)
- b. [Guidelines for the Genotyping of Mice and Rats, ARAC Guidelines, Office of Animal Care and Use, National Institutes of Health, Revised 09/11/13;
\[http://oacu.od.nih.gov/ARAC/documents/Rodent_Genotyping.pdf\]\(http://oacu.od.nih.gov/ARAC/documents/Rodent_Genotyping.pdf\)](#)