TEXAS TECH UNIVERSITY
HEALTH SCIENCES CENTER
EL PASO

Institutional Animal Care and Use Committee
Policy #16
Tail Snipping and Tail Biopsy of Rodents

In concurrence with
TTUHSC El Paso Assurance #D19-01056
and Federal Regulations and Guidelines

1. Background

The purpose of a tail snip is to obtain a small amount of tissue and/or blood from a rodent to prepare DNA for genotyping or other analysis. The technique involves the removal of the fleshy tail tip, thus avoiding the bony vertebral segments. A tail biopsy, which is a more invasive procedure, involves the amputation of the tail between bony vertebral segments.

Both procedures usually lead to bleeding at the site. A tail snip is easily performed on mice ≤21 days. When ≤2mm length of tissue is collected from these young mice, the procedure does not cause the animal undue pain or distress because the vertebra in the distal tail tip are not yet calcified[1, 2]. By analogy, this procedure is similar to human ear piercing, which does not require the use of anesthetics nor analgesics. When a similar procedure is performed on older mice (>21 days), or when >2mm length tissue is collected, this constitutes a tail biopsy because the tissue removed will likely contain calcified vertebrae[1, 2]. A tail biopsy is considered to be a painful procedure and requires the use of anesthetics and analgesics, unless scientifically justified and approved by the IACUC.

2. Guidelines for Tail Snips (collecting ≤2mm tissue from mice ≤21 days)

A. A tail snip is easy to perform and does not cause pain or distress. The use of anesthesia is suggested but not required.

B. Tail snipping should be performed using sharp scalpel blades, scissors or razor blades. The length of tissue collected should not exceed 2mm.

C. If tail snips are performed on multiple animals using the same scalpel or razor blade, the use of each blade should be limited to 5 animals/blade. (Be aware that cross-contamination of DNA samples may occur when using the same scalpel or razor blade on multiple animals. Cleaning the instrument between use on each animal with 70% ethanol is often used to prevent contamination.)

D. Bleeding from the sampling site may stop spontaneously, but if it does not stop, adequate hemostasis may be achieved by applying brief pressure on the stump with gauze or a cotton ball, and/or application of a cautery pen, styptic pen or silver nitrate to the site.

E. In most cases, the IACUC recommends that tail snipping for genotyping be performed on animals that are 10-14 days old. If genotyping must be performed after weaning, the weaned animals must be moved to an IACUC-approved experimental protocol. Genotyping that occurs after day 21 of age must include analgesia, as in some strains, tail vertebra have ossified.

3. Requirements Specific for Tail Biopsy (mice >21 days old and/or >2mm tissue collection)

A. Removal of tail segments including amputation between bony segments is considered to be a painful procedure and requires general anesthesia with or without analgesics. If anesthesia and analgesics are contraindicated, the investigator must provide adequate scientific justification and obtain IACUC approval.

B. Alternatives to tail snips and biopsies should be considered. Small quantities of blood from distal veins (e.g., saphenous vein) or skin samples from ear punches may be used for analysis, and PCR assays using cheek swabs and hair bulbs have also been described[3-6].

References

1. National Institutes of Health (NIH) 2002. NIH guidelines for genotyping of rodents (June 12, 2002), https://oacu.oir.nih.gov/sites/default/files/uploads/arac-guidelines/b3-rodent_genotyping.pdf
2. Hankenson, F.C; Garzel, L.M; Fischer, D.D; Nolan, B; Hankenson, K.D. Evaluation of Tail Biopsy Collection in Laboratory Mice (Mus musculus): Vertebral Ossification, DNA Quantity, and Acute Behavioral Responses. J Am Assoc Lab Anim Sci. (2008) 47, 10–1.
3. Irwin, M.H.; Mofatt, R.J.; Pinkert, C.A. Identification of Transgenic Mice by PCR Analysis of Saliva. Nature Biotechnology (1996) 14, 1146-1148.
4. Pinkert, CA. Transgenic Animal Technology: Alternative in Genotyping and Phenotyping. Comparative Medicine (2003) 53(2): 126-139.
5. Schmitteckert, E.M.; Prokop, C.; Hedrich, H.J. DNA Detection in Hair of Transgenic Mice—A Simple Technique Minimizing the Distress on the Animals. Laboratory Animals (1999) 33(4), 385-389.
6. Zimmermann, K; Schwarz, H.P.; Turecek, P.L. Deoxyribonucleic Acid Preparation in Polymerase Chain Reaction Genotyping of Transgenic Mice. Comparative Medicine (2000) 50(3), 314-316.