A. Introduction

Amputation of the distal tail is often performed as a means of obtaining tissue or blood for biochemical analysis or genetic monitoring in rodents. This procedure applies to colony breeders, researchers and technicians who collect tissue samples from mice for genetic identification.

For genetic monitoring, PCR techniques may require less tissue. Principal investigators are strongly encouraged to utilize a less invasive procedure for obtaining tissue. Alternatives to tail snipping include the use of auricular flap tissue obtained during the ear punch identification procedure, hair bulb or fecal samples or the saliva swab method. Southern Blot testing may require more material and need tissue from the tail.

B. Guidelines

1. Ear Tissue Sampling

As an alternative to tail sampling, tissue can be collected from the ears of rodents. These samples may be collected by using a standard rodent ear punch instrument. The instrument punctures a small hole in the pinna of the ear and provides the researcher with a small amount of tissue for analysis. This procedure does not require the use of anesthetics or analgesics as long as the procedure is performed by a trained individual. The other advantage is utilizing this procedure is that the hole that remains in the ear of the rodent may be used for individual animal identification.

2. Fecal Sampling

Stool samples from rodents can easily be collected from rodents either by collecting samples from the cage bottom or by collection of a fresh sample directly from the animal (rodents routinely defecate when gently handled). The procedure to genotyping rodents using stool samples is described in the following article:

TITLE: “Non-invasive transgenic mouse genotyping using stool analysis”
AUTHORS: Broome RL, Feng L, Zhou Q, Smith A, Hahn N, Matsui SM, Omary MB
CIT. IDS: PMID: 10580111 UI: 20047846

3. Hair Bulb Sampling

This sampling involves the use of hair bulbs from rodents for genetic analysis. Hair bulbs can be directly used for PCR analysis after alkaline lysis. This procedure allows for a large amount of animals to be tested in minimal time and is non-invasive. The procedure to genotyping rodents using hair bulb samples is described in the following article:
4. Saliva Sampling

Studies have shown that a small amount of saliva contains enough oral epithelial cells and lymphocytes to yield sufficient DNA for PCR analysis. This is a non-surgical technique that involves oral washing of weanling mice with a plastic pipet tip. The procedure to genotyping rodents using saliva samples is described in the following article:

TITLE: "Identification of transgenic mice by PCR analysis of saliva"
AUTHORS: Irwin MH, Moffatt RJ, Pinkert CA
CIT. IDS: PMID: 9631068 UI: 98294524

5. Tail snipping

Anesthesia is not required in mice before weaning (21 days of age) if less than 5 mm of length is taken. The skin can be pushed down toward the tip of the tail so that the vertebrae are avoided. Innervation of the tip of the tail is minimal at this age.

Tail tip samples greater than 1 cm in length will probably damage the coccygeal vertebrae and will require anesthesia in mice of any age. Anesthesia is required for any tail snipping if animals are greater than 21 days old or if multiple tail samplings are required.

a. Anesthesia
   Local: FluorEthyl, cetyl chloride, or similar hypothermic methods.
   Injectable: Avertin, Ketamine/xyazine, ketamine/diazepam
   Inhalant: Inhalant anesthetics (halothane, isoflurane, or metofane with appropriate safety precautions for personnel) or CO2

b. Standard Technique
   - Gloves should be worn when handling laboratory animals
   - Anesthetize mouse (if required).
   - Gently, but securely, restrain mouse.
   - Swab tail with alcohol (providone iodine or chlorhexidine solutions may interfere with the DNA identification tests).
   - Push skin toward tip of tail.
   - Snip skin sample (with sterile instrument[s]).
   - Apply gentle compression until hemostasis occurs.
   - Apply surgical glue or silver nitrate powder(Quic-stop) to tail tip if bleeding continues
   - Release mouse.
   - Observe mouse for bleeding or abnormal behavior.
   - Check tail daily to ensure tip is healing.
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