I. Purpose

This guideline provides guidance and methods for genotyping rodents.

1. Scope

This guideline is applicable to all personnel who perform genotyping procedures on rodents.

1. Methods
2. Ear punch: A rodent ear punch is used to create a hole or notch in one or both ears.
3. Tail biopsy: A very small segment of the distal tail is amputated. Tail biopsy collection is recommended in mice less than 35 days of age, prior to ossification of the terminal tail. Perception of pain is assumed to be more likely once the cartilaginous tissue ossifies into bone. Tail biopsy performed on mice or rats ≤21 days of age does not require anesthesia. Animals must be appropriately restrained during the procedure to minimize trauma. Sterile sharp scissors (must be disinfected between uses) or a sterile blade per animal should be used for the procedure. The smallest possible section of tail should be collected, and adequate hemostasis should be achieved via use of pressure or application of silver nitrate, styptic powder, or tissue adhesive. Only the distal 0.5 cm of the tail should be amputated. Animals >21 days of age or animals requiring a second tail sample must be appropriately [anesthetized](https://www.montana.edu/orc/iacuc/policies/administration-of-analgesics-anesthetics-and-antibiotics-in-rodents.html). Additionally, animals >35 days of age must be given a systemic [analgesic](https://www.montana.edu/orc/iacuc/policies/administration-of-analgesics-anesthetics-and-antibiotics-in-rodents.html) at least once following the procedure. If multiple tail biopsies are required a maximum of 1 cm total tail length can be amputated, with all tail biopsies combined.
4. Small quantities of blood from distal veins (e.g., saphenous vein) may be used for analysis.
5. PCR analyses using saliva1 and hair2 have also been described.

**References**

1. Guide for the Care and Use of Laboratory Animals, 8th Edition pg. 75

2. Hankenson FC Laire, Garzel LM, Fischer DD, Nolan B, and Hankenson KD. Evaluation of tail biopsy collection in laboratory mice (Mus musculus): Vertebral ossification, DNA quantity, and acute behavioral responses. J Am Assoc Lab Anim Sci 47:10-18, 2008

1Irwin, M.H.; Mofatt, R.J.; Pinkert, C.A. Identification of Transgenic Mice by PCR Analysis of Saliva. Nature Biotechnology (1996) 14, 1146-1148.

2Schmitteckert, 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.