POLICY

The UNMC/UNO IACUC approves several methods of obtaining a source of DNA for genotyping in rodents. The method selected will depend on the amount of sample/s needed for analysis as well as the age of the animal when the sample is collected. These methods include ear punch, blood sample, hair bulb, fecal pellet, buccal swab, and tail biopsy. Principal Investigators must consider using the least invasive method that will meet the requirements for the research study. Instruments must be sharp to ensure minimization of tissue injury and animals must be observed until recovered if anesthetized. Personnel must be trained in the methods to be used.

The tail biopsy method for obtaining tissue from a mouse or rat for DNA analysis is a safe, effective and humane procedure when performed properly. To ensure animal welfare, the following must be adhered to when performing tail biopsies:

- Tissue sample size: 2 mm of the distal tail is generally sufficient; no more than 5 mm is permitted
- Age requirements: 1) 10-21 days of age: Ideally, this is the preferred age as the tail tissue is soft (vertebra are not yet calcified) and the yield of DNA is highest. The use of local anesthesia is recommended such as the use of immersion of the tail in ice-cold ethanol, application of ethyl chloride spray or another approved anesthetic. 2) 21 days or older: General anesthesia is required prior to the collection of tissue.
- Hemostasis: Bleeding must be controlled following the tail biopsy procedure. Compression of the sample site by direct pressure may be sufficient. In some cases, additional methods such as chemical cauterizing agents (i.e., styptic powder and silver nitrate), or electrocautery may be needed.
- Repeat tail biopsies: If additional DNA is needed for retesting, alternatives to a secondary tail biopsy must be considered. Repeat tail biopsies require anesthesia and must be justified in the IACUC protocol. The use of post-procedural analgesia should be considered.

REGULATIONS

The Public Health Service (PHS) Policy, 2002, IV.C. 1."Procedures with animals will avoid or minimize discomfort, distress and pain to the animals, consistent with sound research design”. 1b. “Procedures that may cause more than momentary or slight pain or distress to the animals will be performed with appropriate sedation, analgesia, or anesthesia, unless the procedure is justified for scientific reasons in writing by the investigator.”

U.S. Government Principles for the Utilization and Care of Vertebrate Animals Used in Testing, Research, and Training, IRAC, 1985, Principle IV “Proper use of animals, including the avoidance or minimization of discomfort, distress, and pain when consistent with sound scientific practices, is imperative.” Principle V, “Procedures with animals that may cause more than momentary or slight pain or distress should be performed with appropriate sedation, analgesia, or anesthesia...."
PROCEDURES

1.0  IACUC Approval for Genotyping

1.1  Provide a written description of the genotyping method/s in the IACUC protocol.

1.2  If proposing the use of the tail biopsy method, ensure to include age of the animal.

   A. If proposing tail biopsies on animals greater than 21 days, provide scientific justification and
general anesthetic to be used.

   B. If proposing multiple tail biopsies, provide scientific justification and anesthetic to be used.

LINKS TO RELATED FORMS, RECORD LOGS, AND SOPS

SOP on Rodent Genotyping Techniques