Tail Biopsy in Mice BYU Standard Operating Procedure

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1. Tail biopsy can be performed without general anesthesia in mice less than 3 weeks ( <21 days) of age. In the mouse, the distal tail is completely ossified and innervated between 2-4 weeks of age. Thus, tail sampling is recommended in mice less than 3 weeks of age to avoid undue stress and discomfort to the animals. The optimum age at which to **perform biopsy is between 10-15 days old.** For mice that are 16-21 days of age investigators are encouraged to apply local anesthesia to the tail.
2. If the mouse is greater than 21 days of age, anesthesia is used for any amount of tail removal. Tail biopsy requires only brief anesthesia. The inhalant anesthetic isoflurane is recommended. Mice can be anesthetized using isoflurane with a precision vaporizer and a nose cone. Alternatively, an open drop (bell-jar) technique may be used. Injectable anesthetics may also be used. Buprenorphine (Buprenex) 2mg/kg may be administered intraperitonealy (IP) or subcutaneously (SQ) to mice 20 minutes before tail clipping. Topical anesthetics such as EMLA, a mixture containing high concentrations of lidocaine and prilocaine in a cream form, applied topically 45-60 minutes before clipping is also acceptable.
3. Any instrumentation that is used to perform the biopsy should be sharp and sterile. This can be accomplished by using disposable scalpel blades. Please note that disposable scalpel blades are not designed to be used on multiple animals, and a fresh blade must be used for each mouse. Alternatively, scissors can be sterilized using a bead sterilizer or disinfected in 70% alcohol or chlorhexadine for at least 15 minutes.
4. The total amount of tissue clipped and removed should be the minimum necessary (1-2 mm ideally) but not more than 5 mm. Taking more than 5 mm(.5 cm) is not acceptable at any age without the use of general anesthesia.
5. Regardless of age or amount of sample, bleeding must be controlled and the mouse observed until it recovers from the anesthesia and the procedure. If less than 2 mm is taken then hemostasis can usually be achieved by direct pressure on the end of the tail. Hemostasis of the tail biopsy site can be achieved using compression, tissue adhesives (Nexaban), styptic pencils, silver nitrate or cautery.
6. If the mouse is anesthetized using general anesthesia, the animal should be recovered individually in a clean cage after the biopsy is completed. The mouse should be fully ambulatory before it is returned to the original cage or co-housed with other mice.
7. Repeat tail biopsies require general anesthesia and must be justified and approved by the IACUC.
8. An alternative option for tissue sampling is the ear punch. This provides a consistent sample size between animals and does not require anesthesia. This is a less invasive means of obtaining the sample and can be performed in conjunction with ear tag identification of individuals.