Glucose Monitoring on Small Samples of Blood in Rats and Mice

IACUC Standard Procedure
Approval Date: September 2021

UCSF Office of Research
Institutional Animal Care and Use Program

Description of procedure:

1. Glucose monitoring is best performed on awake animals. Anesthesia affects heart rate and blood flow and may induce hyperglycemia in mice and rats. Therefore, anesthesia can alter glucose results.
2. Conscious animals need to be restrained using a commercially available restrainer of appropriate size. Manual restraint is appropriate for experienced users. The duration of the restraint should be kept to a minimum to reduce stress, and the equipment washed frequently to prevent pheromone induced stress or cross-contamination.
3. In mice, sampling from the tail tip is appropriate when only small volumes of blood are needed. Less than 2 mm of tissue is cut from the tail tip, distal to the bone, with sharp scissors or a scalpel. Blood is obtained by direct flow or by gently massaging ('milking') the tail and collecting the blood directly on a glucose test strip, in a capillary tube or other container.
4. Following the initial cut, a 2-hour recovery period is recommended between subsequent samples.
5. Subsequent samples are obtained by gently removing the scab and repeating the massaging procedure.
6. In rats, a blood sample can also be obtained by pricking the lateral tail vein using a sterile needle. For multiple samples start in the middle third of the tail, and work towards the tail base.
7. Evaluate the animal's general appearance and hemostasis before returning to the home cage.

Note: If it is necessary to take multiple samples, smaller blood volumes should be drawn. When appropriate, consider factors like the same time of day for serial blood draws. For maximum blood sample volumes for single and serial blood draws, refer to IACUC Blood Collection Guidelines:
Rat Blood Collection - IACUC Guideline
Mouse Blood Collection - IACUC Guideline

Adverse Effects:
Adverse effects should be listed in the "Adverse Effects" section of the RIO IACUC protocol.

Examples of potential adverse effects may include: hemorrhage, infection.