

**Stony Brook University  
Institutional Animal Care and Use Committee (IACUC)**

**STANDARD ULTRASOUND IMAGING OF RATS AND MICE**

**Facility**

**A. Access to the Ultrasound Room**

- 1) All users must sign up on the ultrasound calendar located on a wall in the DLAR main office (BST room 223).
- 2) The room key is also located in the front office. This key needs to be signed out in order to have access to the room. This key must be returned after the scanning is completed. Users must fill out the usage log located in the room, indicating the length of the imaging session.
- 3) Only users who have been trained by either the Visualsonics representative or the Veterinary staff will be permitted to use the ultrasound machine. Training sessions can be scheduled with the Vet staff at mutually convenient times.

**B. Ultrasound Room Equipment Use**

- 1) All gas tanks must be secured properly in a stand, and chained to the cabinet. An extra oxygen tank will be available in case an empty tank needs to be changed during a scanning session. Advise the vet staff when a tank is emptied so it can be replaced promptly. Remember to turn off the oxygen tank when finished.
- 2) Each user is responsible for supplying their own Isoflurane & Nair which, if needed, can be purchased from DLAR. The unused Isoflurane can be drained from the machine at the end of the imaging session and returned to your bottle. See Vet staff for instructions, or to report any problems with the ultrasound or anesthetic machines. The ultrasound machine must be cleaned with a mild soap and dried after each use.
- 3) Do not leave animals in the imaging room overnight. Maximum isolation animals should be returned to room 13. The conventional animals can be returned to their original room.
- 4) Turn the machine "ON" and select the probe and the user prior to initiating the animal anesthesia.

**Anesthesia**

**A. Anesthesia**

- 1) Mice and rats must be anesthetized with Isoflurane gas for the imaging sessions. The individual animal is first placed into the clear plastic induction box, then transferred to the heated scanning table. The nose of the animal is placed into the end of the Isoflurane gas supplying tube.

- 2) The use of any other anesthetic agent must be identified in the IACUC application.

## **B. Anesthesia Monitoring**

During the scanning procedure, the following parameters must be monitored at a minimum of 5 minute intervals:

- Respiratory rate
- Response to noxious stimulus (ie. toe pinch)
- Spontaneous movement

## **C. Anesthesia Recovery Monitoring**

- 1) To protect the animal from hypothermia they should never be placed on metal surfaces – place animals on a water re-circulating heating blanket, or wrap them in a towel (while still allowing visible monitoring) to conserve body temperature. Thermal packs can also be used. During recovery from anesthesia, the following clinical parameters must be monitored at a minimum of 5 minute intervals until the animal is ambulatory:
  - Respiratory rate
  - Movement
  - Ability to maintain sternal recumbancy
- 2) Animals may crawl into the corners of the recovery cage and bedding can sometimes block the airway. If recovering animals are housed with cage mates, the cage mates will sometime injure animals not responding to stimulation. Personnel should be alert to these possible complications during the recovery period.
- 3) It is estimated that animals will recover within 3-5 minutes post scanning.

## **ULTRASOUND SCANNING PROCEDURE**

- 1) The limbs of a rat or a mouse are taped to the scanning table. A small amount of a cardiac conducting gel is placed under each limb to allow for a physiology monitoring and recording during the procedure. The rectal probe is inserted and secured in place by the tape to allow for a body temperature monitoring and recording.
- 2) A small amount of epilating Nair cream is applied to the area to be scanned. The cream is removed in a few minutes by gentle scrubbing with the gauze squares. Nude mice and rats do not need to be depilated.
- 3) The ultrasound scanning gel is applied onto the area to be scanned, the probe is lowered, and the study and recording session is conducted.

- 4) The remnants of the gel must be removed at the conclusion of the scan to avoid the excessive body heat loss.
- 5) The rectal probe is removed, and the animal is returned to the cage for anesthesia recovery monitoring.
- 6) The study is edited and saved either to the hard drive or portable media storage device.
- 7) The ultrasound machine is turned “OFF” at the end of the study.