STANDARD OPERATING PROCEDURES

DIVISION OF COMPARATIVE MEDICINE
UNIVERSITY OF SOUTH FLORIDA

TITLE: **Xenogen® Bioluminescence Imaging Gas Anesthesia System**
SCOPE: All Animal Care and Research Personnel.
RESPONSIBILITY: Surgical Core Manager, Facility Manager, Animal Care & Research Personnel
PURPOSE: To Establish How to Operate the Isoflurane Gas Anesthesia Unit Portion of the Xenogen Imagining System.

I. PURPOSE

1. Isoflurane inhalation provides safe general anesthesia for a variety of animal species. This procedure outlines the use and maintenance of a veterinary inhalation anesthesia machine that incorporates an oxygen flow meter, anesthetic vaporizer, and a non breathing system with a passive waste gas scavenging system; the unit described is part of the Xenogen Imaging System.

2. The system is comprised of two parts, an induction chamber and manifold, described herein are the steps needed to ensure appropriate anesthesia is maintained throughout an imaging experiment utilizing the Xenogen Bioluminescence Imaging and Anesthesia System.

II. RESPONSIBILITY

1. It is the responsibility of the Surgical Core Manager to ensure that all anesthesia equipment is appropriately calibrated, certified, in good working order, and available for research personnel as requested. However, since ownership of this unit is under the Mouse Model Core, it must be contacted prior to any such actions; the Surgical Core Manager will then assist with the coordination of services.

2. It is the responsibility of the veterinary professional, administrative, and managerial staff to ensure that all research and technical staff using this equipment are adequately trained and experienced to perform veterinary inhalant general anesthesia. Note: Prior to any personnel being allowed to reserve imaging time on the unit (with or without using the anesthesia component), they must go through introductory training with the Training Coordinator and a member of the Molecular Imaging Group, or their designee. Reservation time will then be coordinated through the Facility Manager.

III. PROCEDURES

1. Weigh the two charcoal filters located at the top of the unit before turning on the unit. The weight must be recorded at the beginning of each day's use.
    a. Record the date
    b. Record the weight
    c. Record initials
    d. Replace the unit(s) if either has a recorded increase of 50g.

2. Turn on the evacuation pump.

3. Turn on the oxygen (0_2) tank and adjust pressure to ~50psi.

4. Turn on the oxygen to the unit by turning the green handle up.
    a. Turn the flow meter to the induction chamber on (toggle in up position) and set to 1.5L/min.
    b. Turn the flow meter to the manifold on (toggle in up position) and set to 0.25L/min.

5. Set up the manifold for the appropriate number of animals:
    a. Plug any un-used nose cones with the rubber stoppers provided.
    b. Insert and position light baffles between animals as needed.

6. Press down on the vaporizer release lever and turn the control dial to 3-5%. Note: it will take approximately 2-5min to load the lines with anesthetic agent.

7. Place the animal(s) within the induction chamber until they reach heavy sedation or a light plane of anesthesia. (The imaging does not require the animal to reach a surgical plane of anesthesia, therefore respiratory rate may remain rapid and the animal may not lose response to toe pinch).

8. Check the stage temperature located on the front of the IVIS box. If the stage temperature is not holding the desired temperature properly, notify the Facility Manager so the manufacturer* can be notified (*Must be approved by Mouse Model Core). The temperature can be adjusted by holding down the blue button and using the arrow keys to raise or lower to desired temperature.

9. Quickly move the animal(s) from the induction chamber to a nose cone on the manifold. Be sure to place the nose well within the cone. The vaporizer control dial should be turned down to approximately 1-2% to maintain anesthesia during the imaging process.

10. The unit can be set to take live images every 2-3 seconds, this option should be used to check positioning within the unit, as well as to assess the animal has not regained consciousness. (It is not within the scope of this SOP to describe the Xenogen Software in its entirety, training should be sought through the Mouse Model Core, or member of the Molecular Imaging Group.

11. Following imaging and removal of animals, the unit should be turned off in the following order
    a. Turn the vaporizer control dial to 0%.
    b. Purge the system of isoflurane by allowing the oxygen to continue flowing for 3-5 minutes.
    c. Leave both the manifold and induction chamber flow meter in the up/on position and turn the O_2 supply tank off.
    d. Once the rotameter balls in both flow meters have fallen completely, turn the green O_2 valve off.
    e. Toggle off the manifold and induction chambers.
    f. Turn the flow meter knobs counter-clock wise to prevent excess pressure build up within the lines from damaging “o” rings when the unit is turned on next.

12. Wipe inside the unit, induction chamber and wire floor insert with Clidox® followed by 70% alcohol between animal cages. Clean inside and outside surfaces between animal groups originating from different facility housing rooms and at the end of the day. See **SOP # 1137, Xenogen® Imaging System Procedures** for more information.

Approved: **Date:**