1. **PURPOSE**

This Standard Operating Procedure (SOP) describes the procedures for the care of irradiated mice.

2. **RESPONSIBILITY**

Principal investigator (PI) and their research staff, veterinary care staff.

3. **MATERIALS**

3.1. Disinfectant
3.2. Antibiotics (sulfamethoxazole and trimethoprim or enrofloxacin)
3.3. Sterile isotonic solution for injection (e.g., 0.9% sodium chloride, Lactated Ringer’s Solution)
3.4. Carprofen
3.5. Antibiotic ointment (e.g. sulfadiazine ointment, BNP)

4. **PROCEDURES**

4.1. Consider initiating antibiotic treatment approximately 3 days before irradiation.
4.2. Mice exposed to whole body irradiation should be housed under sterile conditions (i.e., sterile feed, bedding, water, cages) until, if ever, they regain a functional immune system.
4.3. Mice can be irradiated in their home cage. Anesthesia is not required.
4.4. The animal is placed in the irradiator and irradiated at the dose specified in the Animal Use Protocol (AUP) as approved by the Facility Animal Care Committee (FACC).
4.5. Fractionated doses should be considered, if appropriate, to reduce morbidity and mortality.
4.6. Cages of irradiated mice are identified with the following information:
   4.6.1. Dose of irradiation
   4.6.2. Date of irradiation
4.7. Irradiated mice should be monitored on the day following irradiation and then at least three times per week for two weeks thereafter. Observations should be documented on a monitoring log.
4.8. Possible clinical signs following whole body irradiation:
   4.8.1. Weight loss: due to inappetence and diarrhea
   4.8.2. Lethargy
   4.8.3. Hunched posture
   4.8.4. Rough coat
   4.8.5. Anemia: nose and paws appear pale
   4.8.6. Infection
   4.8.7. Intestinal bleeding: feces may appear dark
   4.8.8. Transplant failure: Graft Versus Host Disease
   4.8.9. Graying of the hair coat, particularly in black haired mice
   4.8.10. Development of secondary neoplasias
   4.8.11. Damage to incisors
4.9. Provide one of the following antibiotics in the drinking water (as the sole source of drinking water) for two weeks following irradiation and label cages receiving treatment:

4.9.1. Sulfamethoxazole and trimethoprim (TMS):
   4.9.1.1. Each mL of TMS oral suspension contains 40mg sulfamethoxazole and 8mg trimethoprim.
   4.9.1.2. Add 6mL of TMS oral suspension per 250mL of drinking water.
   4.9.1.3. Re-suspend daily by shaking the water bottle.
   4.9.1.4. Discard solution and prepare fresh after 7 days.

4.9.2. Enrofloxacin:
   4.9.2.1. Add 2.5mL of enrofloxacin (50mg/mL) per 250ml of drinking water.
   4.9.2.2. Discard solution and prepare fresh after 7 days.

4.10. Provide 1ml of sterile isotonic fluids (preferable warmed to body temperature), subcutaneously, immediately before or after irradiation and repeat after 24 hours.

4.11. Provide wet food at the bottom of the cage, daily, for 7 days.

4.12. In case of skin burns:
   4.12.1. Provide carprofen 20mg/kg SC, once a day, for 2 to 5 days to alleviate discomfort.
   4.12.2. Apply antibiotic ointment (e.g. sulfadiazine ointment, BNP) daily on the wound, until healed.

4.13. Humane intervention points:
   4.13.1. When immune reconstitution has been provided by bone marrow transplant, mice usually recover within 2-3 weeks. Animals that have not received a bone marrow transplant will not recover.
   4.13.2. If the general condition of the animal does not improve after 21 days, irradiated mice should be euthanized.
   4.13.3. Euthanize animals with:
       4.13.3.1. Weight loss exceeding 20% of pre-irradiation weight.
       4.13.3.2. Body condition score of less than 2.
       4.13.3.3. No or weak response to external stimuli.
       4.13.3.4. Hunched posture, lethargy and lack of grooming.
       4.13.3.5. Pale eyes and/or extremities.