

ANESTHESIA

SOP 1.001 Anesthesia administration: Isoflurane

Rodents will be anesthetized with Isoflurane delivered through a precision controlled vaporizer (initiated using 3% Isoflurane and then maintained on 1-2.5% Isoflurane), via a nose cone with an exhaust to the laboratory exhaust.

Oxygen (O₂) will be the primary anesthesia carrier. Medical air is supplied by an air pump with a 0.2 µm filter and can be used for the induction chamber.

The anesthesia induction chamber is placed on a heating pad maintained between 30°C and 34°C. The induction chamber is lined with absorbent pads and the anesthesia (3% Isoflurane) is delivered through a precision controlled vaporizer that is exhausted to a laboratory exhaust.

Rodents will be monitored for recovery from anesthesia at completion of each imaging session. The rodent will be anesthetized for no more than four hours during any one imaging session with at least one hour recovery between anesthetized imaging studies.

During an imaging session, an electronic feed-back mechanism will be employed to maintain the temperature of the scanning table such that the animal internal temperature is within the correct temperature range (30°C-34°C).

ANIMAL PREP and INJECTIONS

SOP: 1.101 Maintaining Animal Metabolic Rate

Animal cages and anesthesia induction chambers are placed on a heating pad maintained between 30°C and 34°C for at least 30 minutes prior to injection of the imaging agent or start of scan.

SOP 1.202 Tracer Administration-IP

The animal will be injected using a 1 cc syringe with an approved ACUC gauge needle (ACUC 23.000; Recommended Needle Sizes, Sites, and Volumes for Injections). Injection technique will be in accordance with the technique described in section “Intraperitoneal (IP) Injection” in “Laboratory Manual for Basic Biomethodology of Laboratory Animals: Volume I, Mice, Rats, Guinea Pigs and Rabbits”.

IMAGING

SOP 1.304 Optical Imaging (Bioluminescence)

Prior to imaging and during the imaging session, the animal will be anesthetized according to SOP 1.001. The animal will be placed on a heated stage. Because of the short imaging session, the animal cardiac, pulmonary, and temperature functions will not be monitored.

Xenogen IVIS SPECTRUM:

Rodents will be placed on a heated imaging platform (aligned using a grid provided by a class II laser) located within the imaging chamber. The animals are placed on a high quality black paper (Strathmore Artagain # 445-109) for bioluminescence. An anesthesia gas manifold provides for simultaneous imaging of 5 mice.

In addition to a bioluminescence the Xenogen scanner produces a photographic image (auto-exposure, approximately 0.2-0.5 sec) for creation of an anatomical reference image.

The maximum continuous optical imaging acquisition will be 30 minutes.

SOP 1.401 Post Imaging:

At completion of an imaging session, animals will be returned to their cages which are placed on a heating pad and maintained at a temperature between 30°C and 34°C after removing all pertinent probes and medical tape.

Bioluminescence – Imaging Agents

D-Luciferin:

Animals will receive 300 mg/kg [0.05 ml/10g of body weight] D-Luciferin by appropriate injection [max needle size 23G].