

SPECT/CT or PET/CT Imaging in Rodents
IACUC Standard Procedure
Effective Date: October 2023



Description of procedure:

1. SPECT or PET Only

Radionuclide tracers for SPECT or PET imaging will be injected via IP (intraperitoneal) or IV (intravenous) routes following IACUC standard procedure for injection. Animals will be imaged under general anesthesia.

The animal will be positioned within the scanner and will be visually monitored throughout the scan. The SPECT or PET imaging is performed via the detection of radiation emitted from the tracers that have been injected into the animal.

Following the scan, the animal will be allowed to recover from anesthesia unless undergoing a terminal procedure and returned to housing for repeated imaging studies as required. Each session will last approximately 30-60 minutes.

2. CT Only

CT contrast media may be injected via IP (intraperitoneal), IV (intravenous), or oral routes following IACUC standard procedure for administration prior to or during imaging if necessary. Animals will be imaged under general anesthesia. The animal will be positioned within the scanner and will be visually monitored through the scan. During CT scans, the animal will be imaged using x-rays.

Following the scan, the animal will be allowed to recover from anesthesia if not used terminally and return to housing locations per protocol.

3. Combined SPECT and CT, or PET and CT

Animals will be imaged under general anesthesia. The animal will receive radionuclide tracers and/or CT contrast media via IP (intraperitoneal), IV (intravenous), or oral routes following IACUC standard procedure for administration.

The animal will be anesthetized prior to the imaging process and then maintained under general anesthesia during the imaging study. The animal will be positioned within the scanner and will be visually monitored throughout the scan. The SPECT or PET imaging is performed via the detection of radiation emitted from the tracers that have been injected into the animal. During CT scans, the animal will be imaged using x-rays.

Following the scan, the animal will be allowed to recover from anesthesia if not used terminally and return to housing locations per protocol.

4. IACUC Protocol Details

The IACUC protocol should provide a narrative describing the purpose of the imaging procedure(s) and how it relates to the experimental objectives

Personnel:

- If the imaging procedures will be performed by Core personnel under a Core’s IACUC protocol, indicate this in (Section F.2) of your IACUC protocol.
- If Radiology and Biomedical Imaging department personnel will handle your animals and perform imaging as part of a collaboration, add Radiology personnel to Section D. of your IACUC protocol.

Agents:

- Isoflurane, potential injectables and contrast agents depending on protocol will be used.
- All agents administered to animals should be listed in the “Agents” section of RIO.

Adverse effects, monitoring, and management:

Adverse Effects		
Procedure, Agent or Phenotype	Potential Adverse Effects	Management
Contrast Agents	None anticipated, as animals will be anesthetized throughout procedure	None needed
Radiation dose from tracers and CT	Nausea (Manifested as generalized ill appearance) and/or diarrhea	We will image the animal acutely and under anesthesia, and then will euthanize the animal. Alternatively, LARC veterinarians may be consulted for treatment
Radiation dose from tracers and CT	Susceptibility to infection	Consult with veterinary staff or euthanize.
Monitoring Parameters		
Monitoring Parameters	Frequency	PI/Lab will Document
General appearance and behavior	Per-protocol	Per-protocol
Describe any experimental endpoints that would result in removal of an animal from study. For all investigators housing animals with tumor formation, skin lesions, neurological deficits, or Category E studies, list the expected endpoints of the animal model and the criteria for euthanasia.		
Removal criteria from the original research protocol continues as part of the imaging procedure.		

*In this IACUC Standard Procedure, “rodent” refers to: laboratory rats and mice, gerbils, guinea pigs, hamsters, naked mole rats, spiny mice, and voles.