



Standard Operating Procedure (SOP)

Title: Radioligand Handling	SOP No. SAIL-PET-SOP-01
	Version No. 02
	Effective Date: July 28, 2017
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1. Purpose

This SOP describes and outlines the proper acquisition, handling, and disposal of radioligands to be used for the purpose of scanning with the Mediso SPECT/CT and PET/CT scanners.

2. Scope

Applicable to all studies involving scanning with the SPECT/CT and PET/CT scanners.

3. Responsibility

- 3.1 The SPECT/CT/PET technician, under the supervision of the SAIL Manager, is responsible for maintaining safety and security standards within the SPECT/CT/PET facility.
- 3.2 The SPECT/CT/PET technician, under the supervision of the SAIL Manager, is responsible for the inspection and maintenance of the equipment within the SPECT/CT/PET facility. As such, he/she is responsible for reporting any problem with and/or damage to the equipment to the SAIL Manager as soon as possible.
- 3.3 The SPECT/CT/PET technician is responsible for ensuring a clean and safe laboratory work environment for the handling of radioactive materials in compliance with RI-MUHC radioactivity safety standards and procedures.
- 3.4 Only trained SPECT/CT/PET technical staff are permitted to handle radioactive substances and operate the SPECT/CT and PET/CT scanners. If external observers and/or collaborators are to be involved in the scan process, their participation will need approval from both the SAIL Director and the Principal Investigator(s) involved in the study.
- 3.5 The SPECT/CT/PET technician is responsible for ensuring that all observers/collaborators in the SPECT/CT/PET facility understand and adhere to the RI-MUHC radioactivity safety standards and procedures.
- 3.6 The SPECT/CT/PET technician is responsible for the reporting of any accidents and/or incidents that occur within the facility. These incidents will be documented and recorded on the accident/incident forms as provided by SAIL in accordance with RI-MUHC policies.

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4. Materials

- Lab coats
- Disposable rubber (latex or nitrile) gloves
- Face mask
- Safety goggles or face shield
- Lead barrier and/or radioactive shielding
- Certified radioactive waste disposal unit
- Lead transport container
- Dedicated 'hot-room'
- Eppendorf tubes
- Geiger counter or other radioactivity measurement device
- Approved disinfectant wipes

5. Radioactivity Safety and Conduct

- 5.1 Only the SPECT/CT/PET technician is permitted to enter the radioactive 'hot room' (E.S2.8438) and directly handle the radioactive substances.
- 5.2 Be sure to always wear lab coat, closed footwear, and cover any exposed body regions at all times when handling radioactive substances.
- 5.3 A certified radioactivity dosimeter must be worn at all times when in the SPECT/CT/PET facility.
- 5.4 Disposable gloves must always be worn when handling radioactive substances. Change gloves frequently and dispose of used gloves in the designated radioactive waste container to prevent contamination of workspace.
- 5.5 All personnel and/or collaborators who will need to enter the SPECT/CT/PET facility must first present certification of having completed the radioactivity safety workshop as offered by the MUHC radioprotection service.

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6.Procedure

6.1 Radioligand reception

- 6.1.1 Put on a lab coat with a radioactivity badge, and cover any exposed body areas before entering the radioactive 'hot room' (Room E.S2.8438).
- 6.1.2 Bring the radioligand transportation box delivered by the company Isologic using the wheeled cart.
- 6.1.3 Wearing gloves, and protective safety goggles, open the transportation box on the cart, bring the lead transport container to the shielded radioligand preparation area on the lab bench, and remove the radioligand vial.
- 6.1.4 Perform a wipe-test on the surface of the transportation box to detect potential traces of contamination.
- 6.1.5 Place the radioligand vial in the lead carrying container until use, and put back the lead transport container in the transportation box to return to Isologic.

6.2 Radioligand preparation

- 6.2.1 Using the dose calibrator, take a reading from the radioligand vial and note the radioactivity measurement.
- 6.2.1 Return to the shielded workspace and using an appropriate syringe (1 mL for rats and 0.3mL for mice); withdraw from the vial the necessary volume radioligand (200-400 μ Ci for rats and 80-150 μ Ci for mice) for the tail vein injection. Remove any air bubbles from the liquid in the syringe and put the syringe into the lead carrying container within the shielded workspace.
- 6.2.2 Put on new gloves and while ensuring that the radioactive carrying container is properly sealed, transport the radio-ligand in the syringe from the "hot room" to the SPECT/CT room (E.S2.8429) or PET/CT room (E.S2.8437).
- 6.2.3 Clean the shielded workspace with approved disinfectant wipes, remove the lab bench liner and dispose of all contaminated materials in the designated radioactive waste container. Remove the contaminated gloves and dispose of them along with the radioactive waste. Place a new and uncontaminated bench liner in the workspace.

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6.3 Radioligand disposal

- 6.3.1 Remaining radioactive substances and any contaminated materials (*i.e.* test tubes, pipette tips, needles, and syringes) should be disposed in the designated radioactive waste containers.
- 6.3.2 Clean all surfaces and contaminated equipment with approved disinfectant wipes and remove all bench liners used in the lab space. Dispose of the bench liner and cleaning materials in the radioactive waste container along with your gloves.

7. References

SAIL-SOP-02: Animal Management

SAIL-PET-SOP-03: Anesthesia Induction and Maintenance

McGill Radiation Safety Policy Manual, Edition 6.0

8. Appendices

None

