

STANDARD PROTOCOL REQUIREMENTS: PET RADIONUCLIDES IN ANIMALS

With or without a Radiation Safety Protocol, the following must be observed:

1. The injection/infusion room and the housing room will each be posted with a "Caution Radioactive Materials" sign throughout the experiment. After the experiment has been concluded, if radioactive materials are not going to be used again in the near future, a closeout survey of each room will be performed with smears to ensure that all radioactive materials have been removed and that all areas are less than 220 dpm per 100 cm². Then, the "Caution Radioactive Materials" signs will be removed. A copy of each survey, documented on an NIH 88-12 monthly survey form, will be sent to the Division of Radiation Safety.
2. Animal handlers who will be assisting in the procedures or caring for the animals which have received injections/infusions of radioactive materials will complete the required course, "Radiation Safety for Animal Handlers" or equivalent training specific to the protocol work will be provided by the Authorized User or his/her designee.
3. Investigators who will be injecting the PET radionuclides into, or who will be performing immediate blood draws from, the animals will wear ring and whole body dosimeters.
4. Animal handlers may be required to wear whole body dosimeters depending on the extent of their involvement immediately after a procedure.
5. Absorbent paper will be placed underneath the animals throughout the injection or infusion procedure.
6. Absorbent paper will be placed under the cages (except for those housing rodents) in the housing area to prevent the floor from becoming contaminated.
7. Cages used to transport and/or house the animals will be labeled "Caution Radioactive Material" with the radionuclide, activity, and date indicated.
8. Cages will be monitored and decontaminated to less than 1000 dpm/100 cm² if necessary, and all labels will be removed before the cages are sent to the cage wash area or are released for general use.
9. Disposable booties will be worn in the injection/infusion room and in the animal housing room if there is a significant potential for the floor to become contaminated. Booties will be removed and disposed of as radioactive waste before the individual leaves the potentially contaminated area.
10. After handling contaminated animals, bedding, or cages, researchers and animal handlers will monitor their hands, arms, clothing, and shoes for contamination. Any detectable contamination must be cleaned immediately, and the Area Health Physicist must be notified (301-496-5774).
11. Specimens (blood, tissue, etc.) collected from the animal after it has received an injection or infusion of radioactive material will be labeled, "Caution Radioactive Material" until it is determined that such samples no longer contain detectable radioactive contamination or content.
12. Double containment will be used if transporting such specimens to another room for

- analysis.
13. Transportation of PET doses shall utilize stairwells or cargo elevators. Passenger elevators shall not be used. Additionally, cafeterias shall be avoided entirely and general public areas of other types shall be avoided to the maximum extent feasible. Transportation of PET-labeled product shall be via double containment with lead shielding.
 14. If necessary, specimens will be shielded to less than 2.5 mR/hr at 10 centimeters.
 15. All waste items contaminated with PET radionuclides (i.e., i.v. lines, needles, absorbent paper, soiled bedding, animal excreta, and animal carcasses) should be placed in an appropriate waste container labeled "Caution Radioactive Material" and labeled with a waste tag indicating the radionuclide, activity, and date. Disposal procedures shall be followed as listed below:

- The waste can be held for decay and disposed of as non-radioactive waste after a period of at least 10 half-lives post injection. The waste must be secured from unauthorized access or removal during the decay period.

Radionuclide	Half-Life	Minimum Holding Time (10 Half Lives)
O-15	2 min	20 min
C-11	20.3 min	3.4 h
N-13	10 min	1.7 h
F-18	110 min	18.3 h
Ga-68	66 min 11 h	

- After 10 half-lives, remove the waste to a low background radiation area to conduct the survey. An appropriately calibrated survey meter must be used to conduct a survey of each waste item.
 - Monitor background radiation levels. Then monitor each surface of the waste container. If radiation readings above background level are detected, the waste item must be held for additional radioactive decay; an additional day is recommended. Place the waste into a secure area for temporary storage. Monitor the waste the next day. If radiation readings above background level are still detected, contact the Radioactive Waste Service (301-496-4451) for pickup.
 - If radiation readings at the surface of the box are at background level, remove or completely deface any "Caution Radioactive Materials" labels from the surface of the container and dispose as non-radioactive waste.
 - Disposal of other accelerator produced radionuclides with longer half-lives should be accomplished by calling the NIH Radioactive Waste Service.
16. Before a necropsy is performed on an animal which has received an injection or infusion of radioactive material, the Area Health Physicist will be contacted (301-496-5774). He/she will determine what, if any, radiation safety precautions are necessary.