The Radiation Safety Office (RSO) provides an annual dose report to individuals who wear dosimeters under the University of Cincinnati Radiation Control and Safety Program (RCSP). The Ohio Administrative Code (OAC 3710:1-38-10) states that, “Each licensee or registrant shall furnish to each worker annually a written report of the worker’s dose as shown in records maintained by the licensee or registrant pursuant to paragraph (H) of rule 3701:1-38-20 of the Administrative Code.”

The reports are prepared by Landauer, the University of Cincinnati (UC) dosimeter vendor, and are usually received by the RSO during the late-March to early-April time period. The reports are normally distributed with the April or May dosimeters. The original report is maintained in the individual’s radiation worker file at the RSO.

REPORT DESCRIPTION:

INTAKES (Columns 10A through 10D) - Internal dose determined with a bioassay procedure, e.g., thyroid count or urinalysis. This section of the form will be blank for most individuals. An internal dose would have to be reported to Landauer based on a bioassay result before any dose data is entered into these columns.

DOSES (in rem) (Columns 11 through 18) - External dose as determined by whole body (Luxel) badges and extremity rings.

11-DEEP DOSE EQUIVALENT – The external whole body exposure as measured by the dosimeter at a depth of 1 cm in tissue.

12-EYE DOSE EQUIVALENT TO THE LENS OF THE EYE – The external exposure to the lens of the eye at a depth of 0.3 cm in tissue (approximately the depth of the lens of the eye).

13-SHALLOW DOSE EQUIVALENT, WHOLE BODY – The external exposure to the skin or extremity at a depth of 0.007 cm in tissue (the approximate thickness of the outer protective layer of skin (stratum corneum)) recorded by the whole body dosimeter.

14-SHALLOW DOSE EQUIVALENT, MAX EXTREMITY – The external exposure for the extremity receiving the maximum dose as recorded by a ring badge.

15-COMMITTED EFFECTIVE DOSE EQUIVALENT – The equivalent amount of whole body dose due to individual organ uptakes for the amount of radioactive material in Column 10D.

16-COMMITTED DOSE EQUIVALENT, MAXIMALLY EXPOSED ORGAN – The exposure recorded for the most exposed organ from the intake of radioactive material in Column 10D.

17-TOTAL EFFECTIVE DOSE EQUIVALENT – The sum of the DEEP DOSE EQUIVALENT and the COMMITTED EFFECTIVE DOSE EQUIVALENT (internal dose and external dose combined).
18-TOTAL ORGAN DOSE EQUIVALENT, MAX ORGAN – The sum of the DEEP DOSE.

COMMENTS (Section 19) – Contains the summary of all UC dosimeters for all years prior to and including the reported year. It does not include history from other employers or dosimetry companies if the doses were not reported to Landauer.

Every attempt has been made by Landauer to make your annual report complete and accurate. In the report, if you see the designation “ND”, it simply stands for non-detectable dose and means that your occupational radiation exposure, if any, was indistinguishable from natural background. The total effective dose is the best number to use to evaluate your radiation dose for the past year.

If questions arise regarding your dose or an understanding of the Occupational Exposure Record report prepared by Landauer, feel free to call the RSOf at 558-4110.

DECOMMISSIONING A ROOM

This article provides information for the removal, decommissioning, of a RAM-Use room from an Authorized User’s (AU) authorization. Section 7.2 of the AU Manual describes in detail the steps an AU should take when the decision is made to decommission one or more of the RAM-Use rooms listed on their authorization.

Completion of the following steps will result in a successful decommissioning.

1. Notify the Radiation Safety Office (RSOf) at least 30 days in advance of the intended decommissioning of a RAM-Use room. The 30-day notice is the ideal situation and is required by the University of Cincinnati Radiation Control and Safety Program. When a 30-day notice cannot be given, AUs should promptly notify the RSOf as soon as that need becomes known. (Short notice may result in the RAM-Use room not being decommissioned by the date desired by the AU.)

2. Remove all sources of RAM from the RAM-Use room. The RSOf recommends suspension of all RAM use in the RAM-Use room at least two weeks prior to the AU’s final survey. If RAM waste or stock is stored in the RAM-Use room, move it to another RAM-Use room listed on the AU’s authorization, transfer the RAM to another AU or ship it offsite (using a RAM Transfer Request (RS Form 10A)), or package it as RAM waste and request a RAM waste pick-up.

3. If there is RAM-labeled equipment in the RAM-Use room (e.g., refrigerators, centrifuges, ovens, pipettes, etc.), request a “Special Survey” from the RSOf to release the equipment for unrestricted use or to move it to one of the other RAM-Use rooms listed on the AU’s authorization. Special arrangements have to be made if contaminated equipment is going to be disposed, transferred or moved by non-radiation workers. (Do not remove radiation warning signs or postings. This will be completed by a member of the RSOf when the equipment is decommissioned.)

4. Conduct a final survey that is more extensive than a routine monthly survey of the RAM-Use room and submit the results with a Decommissioning of RAM-Use Room form (RS Form 24*), available on the Radiation Safety website at www.uc.edu/radsafety. If contamination is detected during the final survey, decontaminate the area(s) and resurvey until all contamination is removed before submitting the RS Form 24. Contact the RSOf for guidance and assistance if decontamination efforts appear to be ineffective.

(*The RS Form 24 allows for multiple AUs to sign and date a request for a RAM-Use room decommissioning. If more than three AUs are requesting the same RAM-Use room to be decommissioned, a list of AUs submitting the request may be attached.)

To keep an AU’s authorization active, the AU must ensure that at least one RAM-Use room remains on the authorization and that the remaining room(s) cover(s) the three minimum uses of “experiment”, “storage” and “counting”. To meet this requirement, the AU could request a new RAM-Use room be added or a new use could be added to an existing RAM-Use room already listed on the authorization. For example, if the remaining RAM-Use room(s) on an AU’s authorization does not include “counting”, another RAM-Use room must be commissioned for “counting” or “counting” needs to be added to the uses for an existing RAM-Use room already listed on the AU’s authorization. When “any” is listed as a use for an authorized RAM-Use room, all three of the required uses are included. To add, commission, a new room or modify the uses of an existing room, the Application for Non-Human Use of Radioactive Material form (RS Form 6) is used.
The Vontz Core Imaging Laboratory (VCIL):

The VCIL is a small animal imaging core facility in the College of Medicine that operates three multi-modal imagers providing pre-clinical, non-invasive imaging. The center provides imaging services using a Siemens Inveon tri-modal imager that performs µPET, µCT, and µSPECT, and planar nuclear medicine images. The VCIL also has a Bruker MultiSpectral FX imager that performs fluorescence (variable emission and exitation spectra capture), bioluminescence (BLI), X-ray, radioisotopic, and optical modalities. A second Bruker Multispectral FX imager is also available with a multi-angle 2D option. All systems include comprehensive biomedical monitoring; EKG, respiration, temperature warming pads and isoflurane anesthesia capabilities.

The VCIL has equipment designed to enable the development of longitudinal research projects of all types of small animal rodent models. This is optimal for non-invasive assessment of tumor response to trial therapy or for monitoring recovery following organ injury. The imaging systems are optimized for small rodent imaging and are capable of providing both anatomical information and tracking metabolic and pharmacological processes. Combinations of imaging modalities allow integration of the strengths of the modalities while eliminating one or more weaknesses of an individual modality in terms of spatial or temporal resolution or sensitivity for defining specific morphological or functional properties (Cherry, Ann. Rev. Biomed Eng, 2006).

Translational Expertise

The systems in the VCIL offer the possibility of improved diagnostics, therapeutic monitoring, and pre-clinical research using imaging applications that are directly translational to the clinical setting.

VCIL faculty and staff are fully credentialed clinical professionals. This unique feature distinguishes the VCIL as a significant asset for basic science researchers looking to translate their research from the bench to the bedside. Experienced core lab personnel are happy to assist with study design and implementation.

Imaging Agents

A suite of imaging agents is available along with options to customize agents on a case by case basis.

Currently available imaging agents include:
- PET: 18F-FDG, 18F-NaF, 124-Iodine, 11C-methionine, and 18F-Dopamine
- SPECT: 99mTc products, 111-Indium, 125-Iodine
- CT: Microfil, Mercox II, Exitron 6000 & 12000, Gold nanoparticles

All radiopharmaceuticals will be purchased through the VCIL, which will order and receive delivery according to the University of Cincinnati, State of Ohio RAM License, and the VCIL RAM Authorization granted by the UC RSC. Imaging agents and radioactive waste are billed as pass through expenses.

VCIL Contact:

The facility, open to institutional scientists and external investigators, is operated on a recharge basis. The VCIL staff will assist with temporary and permanent IACUC protocol transfers to accommodate imaging agent use and imaging procedures as needed.

Investigators will be given their image data including post processing and image analysis. Data can be provided in various formats as needed.

To learn about available imaging time, imaging and processing rates, and IACUC requirements please send a request to Kati LaSance, CNMT, (VCIL Administrative Director) at lasanckn@uc.edu or call the lab at 513-558-7930.
RSOF: What is your background and how long have you worked with radioactive materials (RAM)?

Kati: My background is in clinical nuclear medicine. I have worked with radiopharmaceuticals and performed PET/SPECT/CT on humans for over 25 years. I have been operating the VCIL for the past 4 years.

RSOF: Why is the radiation safety department involved with the VCIL?

Kati: The VCIL uses radionuclides labeled to commercially available compounds or specially labeled molecules the researchers are interested in tracking in their experimental animal models. After these radiopharmaceuticals are given to the animal, they are followed or imaged with µPET or µSPECT and superimposed with µCT.

RSOF: Who are the staff and faculty in the VCIL?

Kati: Besides myself, Dr. Lisa Lemen, PhD is the primary imaging physicist for the lab and Dr. Zhihua (Jason) Qi, PhD is also an imaging physicist specializing in CT. Dr. Mariano Fernandez, MD is a nuclear medicine physician, who serves as a scientific advisor for protocol development and interpretation. The VCIL faculty and staff are fully credentialed clinical professionals. This unique feature distinguishes the VCIL as a significant asset for basic science researchers looking to translate their research from the bench to the bedside.

RSOF: What researchers have access to the lab?

Kati: The VCIL is available to researchers at UC, CCHMC, VA and other external investigators.

RSOF: Do researchers need radiation safety training?

Kati: It is not required in most cases for researchers to have radiation safety training.

RSOF: Do the researchers have to have a RAM Authorization from UC’s radiation safety office (RSOF) to perform experiments in the VCIL on their animals?

Kati: No, they do not. The VCIL has a RAM Authorization that covers the use of all RAM needed for the researchers imaging experiments.

RSOF: What happens to the animals after they are radioactive? Can I keep them alive and continue my experiments?

Kati: Yes, in fact, being able to perform longitudinal studies is one of the best features of utilizing in vivo µPET and µSPECT imaging with anesthesia. There is a room in the Vontz vivarium that is designated for housing live radioactive animals. They can be housed there as long as necessary for the experiment.

RSOF: What is the best way for researchers to contact you?

Kati: To find out more about available imaging time, rates, and IACUC protocol requirements please send an email to me at lasanckn@uc.edu or call the lab at 513-558-7930. The website is: http://www.med.uc.edu/radiology/research/facilities/vontz.aspx

We are on the web:
www.uc.edu/radsafety
Phone: 513-558-4110
Fax: 513-558-9905

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