

**PREPARATION OF APPLICATION FOR
PROPOSAL TO USE RADIOACTIVE MATERIALS**

Do not use this form for VA applications.

1. Vanderbilt Environmental Health and Safety (VEHS) performs an initial review of the application. The proposal, along with VEHS comments and recommendations, is then distributed to members of the Radiation Safety Committee for their review. **The Radiation Safety Proposal Review Subcommittee meets on the fourth Thursday of each month. In order to be on the Committee's agenda, proposals must be received one week prior to the meeting.**
2. **Forms must be typed.** Answer all questions--any questions not applicable should be so indicated. VEHS will provide consultation and assistance in completing the form if requested.
3. Applications are distributed to the Radiation Safety Proposal Review Subcommittee via email. Therefore it is requested that you send an electronic copy of your application to curtis.kwasniewski@vanderbilt.edu followed with a signed original hard copy to VEHS, U-0211 MCN, (2665).
4. Regulations and procedures pertaining to the use of radioactive material at Vanderbilt are presented in the *Radiation Safety Manual* and the *Radiation Safety Policies and Procedures Manual*. Each Principal Investigator should have a copy of these manuals, which may be obtained from the VEHS.
5. Your requested radioisotope possession limit(s) should be no larger than necessary, but should take into account minimum order amounts, multiple orders on hand at one time, etc. You will be strictly limited to this possession limit. Amount in possession is the sum of all receipts minus any disposal records which have been returned to the VEHS.
6. All approvals must be renewed and updated annually. The VEHS will distribute renewal forms at the appropriate times.
7. Amendments: Any significant changes to radioactive material authorizations must be approved by the Radiation Safety Committee. This includes possession limit increases and changes in radionuclides. Changes in your room(s), such as location (i.e. new additions or evacuations) must be approved by VEHS. VEHS Form 7A must be completed for each room change. Lesser changes, such as changes in lab workers or survey instruments, do not require proposal amendments. However, VEHS should be notified of these changes as they occur.
8. **Human Use Applications:**

Training and experience for Authorized User physicians will meet the criteria outlined in the State Regulations for Protection Against Radiation (SRPAR) 1200-2-10-.33.

- A. In lieu of the requirements of SRPAR 1200-2-10-.33, the following specialty board certification will be accepted as equivalent training for Group I (uptake, distribution, and excretion), Group II (imaging and localization), and Group III (use of generators and reagent kits):
 - 1) American Board of Nuclear Medicine
 - 2) American Board of Radiology in Diagnostic Radiology with Special Competence in Nuclear Radiology

- 3) American Osteopathic Board of Radiology in diagnostic radiology
- 4) Royal College of Physicians and Surgeons of Canada in Nuclear Medicine
- 5) American Osteopathic Board of Nuclear Medicine in nuclear medicine

B. In lieu of the requirements cited in SRPAR 1200-2-10-.33(3) certification by the following will be accepted as evidence that a physician has had adequate training and experience to use Groups IV (use of unsealed sources for therapies generally not requiring hospitalization) and/or Group V(use of unsealed sources requiring hospitalization):

- 1) American Board of Nuclear Medicine
- 2) The American Board of Radiology in radiology or therapeutic radiology
- 3) American Osteopathic Board of Radiology in radiology (after 1984)
- 4) Royal College of Physicians and Surgeons of Canada in Nuclear Medicine

C. In lieu of the requirements cited in SRPAR 1200-2-10-.33(3) certification by the following will be accepted as evidence that a physician has had adequate training and experience to use Groups VI (use of sealed sources for therapy):

- 1) American Board of Radiology in radiology or therapeutic radiology
- 2) American Osteopathic Board of Radiology in radiation oncology
- 3) As a British "Fellow of the Faculty of Radiology" or "Fellow of the Royal College of Radiology" in radiology or with specialization in radiotherapy.
- 4) Canadian Royal College of Physicians and Surgeons in therapeutic radiology.

9. Do not use this form for VA applications. If radioactive materials are to be used at the VA Medical Center, a separate application must be made to the VA's Medical Isotope & Radiation Safety Committee.

Form 7 Help Sheet.

In order to facilitate the expeditious approval of Proposals To Use Radioactive Materials by the Radiation Safety Committee, the following “help sheet” has been created. By ensuring the following areas are covered, a PI’s proposal has much less chance of being rejected due to administrative error, or insufficient explanation. Additional questions in filling out Form 7 should be directed to Curtis Kwasniewski (Curtis.kwasniewski@vanderbilt.edu).

Section 1:

- Are all Half-Lives correct per <http://hps.org/publicinformation/radardecaydata.cfm>
- Are all ALIs correct per <http://www.nrc.gov/reading-rm/doc-collections/cfr/part020/appb/> (VEHS uses the most restrictive ALI available)
- Is the Subtotal for the ALIs correct?
- Do the activities (in mCi) match with Tables 5A and 13E?
- Are only new isotopes, or those with new limit requests, listed in the main table?
- Are all approved isotopes listed in sub-table?
- Is the Total ALIs correct?
- Is the correct Overall Hazard Rating checked?

Section 4:

- Ensure that all activities used in each experiment is listed. (ex. Each experiment uses 4 cultures, each of which uses 2 μCi of ^{32}P . This experiment is performed twice a week)
- Ensure all activities listed in the explanation are in agreement with 13E and 5A.
- Ensure that each isotope requested is addressed.
- Ensure that waste collection/ disposal is addressed for each isotope used.
- Ensure the experiment explanation is detailed enough to be complete, yet not so detailed as to become tedious.
- Provide ample justification for any requests for increase in limits. (ex. We have added 2 additional staff and now run the experiment an additional 2 times per week)

Section 5:

- Ensure that all activities are consistent with sections 1, 4, and 13A.
- Ensure that units are in mCi

Section 12D

- Ensure that the training dates are filled in for each rad worker.

Section 13E

- Ensure that all isotopes utilized are listed in this section.
- Ensure that all activities listed are consistent with sections 1, 4, and 5A.

General:

- Ensure that CV is attached.
- Ensure that an adequate room diagram is attached.

VANDERBILT UNIVERSITY PROPOSAL TO USE RADIOACTIVE MATERIALS

Principal Investigator _____ **Phone** _____

Department _____ **Mailing Address** _____ **Zip Code** _____

1. Radioisotopes: Forms, Possession Limits, Hazard Ratings. Make sure that activities listed are consistent with items #4, #5A, and #12E.

Isotope	Half-life	SHIELDING DATA ¹		Chemical/Physical Forms (general types)	ALI ^{1,2} (mCi)	Requested Possession Limit	
		γ Emitters TVL (mm Pb)	α/β Emitters Range in Plastic			Activity (mCi)	No. of ALI's
Subtotal							

Previously approved radioisotopes at VU:

- Ref: Radiation Safety Reference Manual (Appendix A (Table of Radioisotopes), Radiation Safety Policies & Procedures Manual).
- ALI = Annual Limit on Intake, the intake of an isotope which will result in a radiation worker receiving the Maximum Permissible Dose. Therefore one ALI for one isotope represents the same radiotoxicity as one ALI for another isotope. The Table of Radioisotopes in the Radiation Safety Reference Manual lists the ALI's for common radioisotopes.

ISOTOPE	Current Possession Limits	
	mCi	ALI's
Subtotal		
Total ALI's		

Overall **Hazard Rating** for proposed radioisotope operations:

Hazard Rating: ALI:	<input type="checkbox"/> Slight < 1 ALI (Total)	<input type="checkbox"/> Low 1-150 ALI's	<input type="checkbox"/> Medium 150-100,000 ALI's	<input type="checkbox"/> High > 100,000 ALI's
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- 2. Type of Use:**
- Sealed/Plated sources only
 - In vitro (permits use of above category of sources also)
 - Animal studies (also permits above categories of use)
 - Human Use

- 3 **Title of study** or purposes for which radioisotopes will be used:
4. **Describe procedures for each radionuclide requested.** Describe procedures in sufficient detail to permit an evaluation of the potential contamination and health hazards. Indicate activities and approximate volumes/weights used at all stages. Identify any procedures which involve particularly hazardous operations or present special problems (*examples: work with loose powders under mechanical agitation, procedures with potential for large energy releases*). **Make sure that activities listed are consistent with items #1, #5A, and #13E.** Use additional pages as needed.

5. Data for the Evaluation of Radiation Exposure from Radioactive Material Use

A. List all radioisotopes that will be used in your laboratory and complete the table below for each radionuclide.

Radionuclide/Procedure	Stock vial Activity (mCi)	Max. activity introduced into the experiment (mCi)	*Total time spent handling radionuclide (minutes)	Frequency (time/year)

* Time spent handling radioactive material introduced into the experiment.

B. Please list other uses of ionizing radiation that your staff may be exposed to as a part of their duties (i.e., irradiators, x-ray equipment, accelerators, brachytherapy patients, etc.)

6. **Radioactive Gases and Vapors - Include activities released.**

- A. Will radioactive gases or vapors be released during any operations (ie. ¹²⁵I or ³⁵S)? [] Yes [] No
If yes, answer parts B, C & D below.
- B. Will these operations be conducted in a fume hood? [] Yes [] No
- C. State expected magnitude of releases in activity and fractions of ALI[s].
- D. If applicable, describe procedures taken to trap or minimize releases of radioactive vapors or gases.

7. Describe your laboratory **survey program** for radioactive contamination and measurement of radiation levels (see [Radiation Surveys] in the Radiation Safety Policies & Procedures Manual; if # ALIs from Item 1 exceeds 150, you are required to keep a log of weekly surveys).

8. **Portable radiation survey instruments** available for your use (see [Requirements for Portable Meters] in the Radiation Safety Policies & Procedures Manual; if # ALI's in Item 1 is >150, your lab must have its own survey meter).

Type (eg, GM or NaI)	Manufacturer/Model No.	Instrument Owner	VEHS ID#

9. **Radioactive Animals**

- A. Authorization is requested for the following species:
- B. Radionuclides and activities administered, per animal
- C. Where will radioactivity be administered to animals?
- D. Where will radioactive animals be housed? *Note: If radioactive animals will be housed in the Division of Animal Care, you must enclose the form entitled "Radioactive Animals - Division of Animal Care." Forms are available from VEHS or from Animal Care.*
- E. How long will animals contain radioactivity before they are sacrificed?
- F. Anticipated fraction of administered radioactivity that will appear in animal's
 urine & feces _____ exhaled air _____ carcass _____

10. **Radiation Protection Equipment:** List equipment used for protection of workers and environment from radioactive contamination and from external radiation levels, e.g., lipped trays, lead brick shields.

11. **Radioactive Waste.** Check applicable disposal categories.

Solid waste: Describe waste container (see Radioactive Waste Disposal Policies and Procedures in the Radiation Safety Policies & Procedures Manual).

Bulk liquid: Approximate monthly volume:

Sewer disposal: Describe types of liquids to be disposed of, and maximum activity per day:

Biological waste: Type animal: _____ Number of carcasses/wk

Mixed waste, i.e., radioactive waste which is also chemically toxic (excluding liquid scintillation fluids), or is biologically hazardous, carcinogenic, explosive, etc). Describe the nature of the hazard and precautions/procedures used to identify, package, and safely handle the material.

12. **Radiation Workers**

A. Supervisor of radioisotope work in the laboratory, if other than PI:

B. Technical or administrative staff, in addition to PI, authorized to sign requisitions for radioisotopes (if any):

C. **For Human Use applications**, physicians responsible for administration and management of humans administered radioactive material:

Name:	
State/Territory Licensed:	
Specialty Board:	
Category:	
Month/Year Certification:	

D. List personnel (including graduate students, etc) who will be working with radioactive materials. Attach documentation of any previous training (either copies of training certificates or letters from radiation safety officers). For personnel who received training at Vanderbilt you only need to provide the month and year. Refer to Radiation Safety Training Requirements in the Radiation Safety Policies & Procedures Manual for training requirements.

Name	SS#	Training at Vanderbilt	
		Radiation Safety Course	Orientation

13. **RADIOACTIVE MATERIAL ROOM:** Building & Room # _____ Hazard Rating

Use one sheet for each radioactive material (RAM) room. Include rooms used for storage of RAM

- A. Briefly describe the main use of the room (radioactive storage, main prep room, etc.).
- B. If a RAM room is shared among two or more investigators who are approved for radioisotope use, list all of them.
- C. State material and thickness for shielding of storage areas or RAM containers (gamma & high energy β -emitters).
- D. How are radionuclides secured against unauthorized removal?
 locked container room locked when unoccupied other (explain)
- E. Isotopes & Amounts - **Must correlate activities listed here with items #1 & 4.** If Major Preps will not be performed, indicate not applicable (N/A).

Isotopes Used In This Room	Typical Use		Major Preps	
	Amounts Used (mCi)	Frequency (daily, weekly, monthly)	Amounts Used (mCi)	Frequency (daily, weekly, monthly)

- F. Provide a sketch of the room on a *separate page*: Please draw as close to scale as possible, indicate the main entrance and the items listed below. **Make sure that any equipment listed in item #4 is included in the diagram.**

Sinks used for RAM	RS
RAM benches	RB
RAM hoods	RH
RAM centrifuges	RC
RAM incubators	RI
RAM waste	RW

Refrigerators used for RAM storage	RR
Freezers used for RAM storage	RF
Combination Refrigerator/Freezers Used for RAM storage	RR/RF
Cross-hatch any areas in which radioactive materials are <i>not</i> permitted.	

For assistance, contact VEHS. In most cases a to-scale, computer-generated outline of the room can be provided.

14. **Training and Experience of Principal Investigator**

Name: _____ Title: _____

Faculty Visiting faculty or staff *A Fellow, Resident, Graduate student or non-faculty staff member cannot be approved as a PI.*

A. Formal education (or attach CV)

Institution	Degree	Year	Major or Field of Study

B. Training (*Must be filled out, even with CV.*)

Type of Training	Where Trained	Duration of Training	On the Job	Formal Course
Principles and practices of radiation protection			<input type="checkbox"/>	<input type="checkbox"/>
Hazards and biological effects of radiation			<input type="checkbox"/>	<input type="checkbox"/>
Radioactivity measurement and monitoring techniques & instruments			<input type="checkbox"/>	<input type="checkbox"/>
Mathematics basic to the use and measurement of radioactivity			<input type="checkbox"/>	<input type="checkbox"/>

C. Experience with radiation: Give a brief description of your previous work experience with radioactive materials, indicating your credentials to administer your proposed radioisotope program. List radioisotopes and maximum amounts used.

15. **Signature.** I agree to accept the responsibilities of a Principal Investigator as stated in the Vanderbilt University Radiation Safety Manual and the Policies and Procedures Manual and will abide by Vanderbilt University and the State of Tennessee regulations governing the use of radioactive materials.

Principal Investigator: _____ Date: _____