

APPLICATION FOR NONHUMAN USE OF RADIOACTIVE MATERIAL

(One application per protocol, please type or print clearly. Check boxes as appropriate)

New Project Existing Project (_____): New Radionuclide Possession Limit Increase New Protocol

Responsible Investigator _____ PhD Other _____
Beyond Baccalaureate

Clemson Identification Number C _____ Date of Birth ___ / ___ / _____

Office Address _____ Room _____ Building _____ E-Mail Address _____@clemson.edu

Phone Numbers: Office _____ Lab _____ Cell _____ Fax _____

University Position & Academic Rank _____ Department _____

New applicant Currently or previously authorized at Clemson, project number(s) _____

Person to contact about this application _____ Phone _____ E-Mail _____

TRAINING AND EXPERIENCE OF RESPONSIBLE INVESTIGATOR

New applicants must include a completed Form R-002, *Training and Experience of Radiation Project Responsible Investigator*. Applicants who have previously filed a training and experience form must complete the training form only when documenting a significant change in training or experience.

Training and experience previously submitted Form R-002 attached

REQUESTED RADIONUCLIDES

Unsealed Radioactive Material - Unsealed radioactive material will be acquired and used.

ISOTOPE	PHYSICAL FORM	CHEMICAL FORM*	SUPPLIER**	ACTIVITY PER EXPERIMENT	EXPER. PER MONTH	REQUESTED POSSESSION LIMIT, mCi

* Use general categories whenever possible (e.g., amino acids, proteins, nucleic acids, hormones, etc.)

** Enter: "Licensed Supplier" (if purchased from Amersham, ICN, NEN DuPont, Fisher etc.), or Name of Licensee (e.g., University of Illinois), or Number of another Clemson project (e.g., RN-001)

RADIATION SHIELDING AVAILABLE

- Beta: Acrylic bench top shields Acrylic micro-tube shields Acrylic storage boxes
Gamma: Lead acrylic bench top shields Lead foil Lead sheets Lead bricks
Waste: Acrylic beta shield for primary container Lead gamma shield for primary container
 Acrylic beta bench top waste containers
 Other as follows: _____

RADIATION SAFETY PRECAUTIONS THAT WILL BE EMPLOYED

Personnel Monitoring and Protective Measures

- Dosimeters will be worn by project personnel when appropriate.
 Project personnel will report to the Radiation Safety for thyroid monitoring after performing iodinations or handling significant quantities of radioiodine as outlined on the appropriate radiation safety data sheet.
 Project personnel will wear lab coats, disposable lab gloves, protective eye wear, and other protective apparel as needed to prevent contamination of body surfaces and personal clothing.
 Project personnel will be required to monitor hands, shoes, and lab coat before breaks, lunch, completing work sessions, and at other meaningful times.
 Other as follows: _____

Radiation Surveys

- Lab contamination surveys will be performed by project personnel at least once each month unsealed radioactive material is used.
 A survey meter will be used by project personnel to survey the work area at meaningful times.
 For radionuclides undetectable by survey meter, smear samples will be taken by project personnel at meaningful times and promptly analyzed in a liquid-scintillation counter or other appropriate equipment.
 Other as follows: _____

Radioactive Material Security

Regulations require that all radioactive material be secured against unauthorized use or removal when laboratories are unoccupied. Select at least one of the following choices.

- ALL** entrances to rooms containing radioactive material will be locked when unoccupied, **Or**
 ALL radioactive material will be kept in locked cabinets when personnel are not present. This includes waste containers, samples being counted, specimens, material in storage, etc. **Or**
 Other as follows: _____

RADIOACTIVE WASTE DISPOSAL – Indicate the types of radioactive waste that will be generated.

Dry Solid Radioactive Waste

- Gloves, paper, disposable plastic ware, unbroken glass, etc. Hypodermic needles, syringes, scalpels
 Sharps - Pasteur pipettes, razor blades, broken glass etc. Other _____
- Possible Contaminants: Blood or blood products Infectious organisms (list in protocol)
 Carcinogenic, mutagenic, or Hazardous chemicals (list in protocol)
 teratogenic materials (list in protocol) Other _____

Animal Waste

- Carcasses
Possible Contaminants: Bedding Blood Tissue or organ samples
 Hazardous chemicals (list in protocol) Infectious organisms (list in protocol)
 Carcinogenic, mutagenic, or teratogenic materials (list in protocol) Other _____

Aqueous Waste - Liquids that are soluble or biomedical materials that are readily dispersible in water:

- Will be collected and transferred to the Radiation Safety personnel for disposal, **Or**
 Will be disposed of by sink and will not exceed **3 mCi** per month of **ALL** radionuclides combined, **Or**
 Requested monthly disposal limit _____ mCi (justify the need for the increase in the protocol)

Liquid Scintillation Waste

- Vials Bulk Fluid Fluid will contain intact tissue or organ fragments (chunks)
 Standard, low flash point scintillation fluid will be used (containing toluene, xylene, pseudocumene, etc.)
 High flash point scintillation fluid will be used (frequently advertised as biodegradable or non-toxic)
 Fluid will contain the following HPLC solvents _____

- Possible Contaminants: Hazardous Chemicals (list in protocol) Infectious organisms (list in protocol)
 Carcinogenic, mutagenic, or teratogenic materials (list in protocol) Solvents other than original components of the fluid (list in protocol)

Contaminated Solvents - List all solvents contaminated with radioactive material that will be generated.

Solvents that are not miscible in water (indicate quantities in protocol):

- Formalin or formaldehyde Hexane Other _____

Solvents that are miscible in water (indicate quantities in protocol):

- Acetonitrile Alcohol Other _____

- Possible Contaminants: Hazardous chemicals (list in protocol) Infectious organisms (list in protocol)
 Blood or blood products Other _____

Gases

- Radioactive gases or vapors (e.g., CO₂, SO₂, H₂O, I₂) will be generated during the work described in this application (provide details in the protocol).

Radioactive Waste Minimization - All radionuclide projects are strongly encouraged to implement a radioactive waste minimization program. Describe the steps that will be taken to reduce the amount of waste generated by this project.

RADIATION HAZARDS EVALUATION

- Iodinations** - Iodinations will be performed. Labeling with radioactive iodine frequently creates iodine vapors, which could contaminate personnel or work areas, be inhaled by project personnel, or be released in fume hood effluent. To prevent this from occurring, the use of activated carbon filters is required before opening stock solution vials containing millicurie quantities of radioactive iodine and when performing labeling procedures using millicurie quantities of radioactive iodine. I-125 and I-131 data sheets provide further details. In the protocol, describe the charcoal filtering method(s) that will be used. Include drawings if necessary. If the creation of iodine vapors is not possible during the procedures to be performed, provide a complete explanation with any available data that supports the reasoning.

- Airborne Radioactivity** - The work to be performed will create radioactive gases, aerosols, dusts, fumes, mists, volatile liquids, or solids that could readily sublime during the proposed work. Provide detailed information in the protocol regarding the protective actions that will be taken.

- External Radiation Hazard** - The radionuclide will generate a significant level of penetrating radiation that will require extra shielding during use or storage (e.g., Na-22, Co-60, Sc-64, Sr-85, Nb-95, Ru-106, Cs-137). Provide detailed information in the protocol regarding the protective actions that will be taken.

- Other** - List any other unique or unusual radiation hazards associated with the proposed procedures. Provide detailed information in the protocol regarding the protective actions that will be taken. Consider personnel exposure, potential for spills, etc. Attach additional sheets if necessary.

INVESTIGATIONAL PROTOCOL – Provide all requested information. Use additional sheets if necessary.

Abstract: Provide a general description or overview of the procedures that will be performed.

Protocol Details - Describe all steps of the procedure(s) in which radioactive material is used (e.g., dispensing stock solutions, dilutions, incubations, filtration, centrifugation, electrophoresis, HPLC analysis, autoradiography, counting, etc.). Emphasize the dynamics of the flow of radioactive material during the procedure(s) including how radioactive material is introduced into the system, how material is incorporated into samples, and the nature and quantity of any radioactive waste that is produced. Provide details regarding the mixture of radioactive material with solvents or chemicals. Include important radiation protection precautions that will be taken during the procedure. Attach additional sheets if necessary.

CERTIFICATION OF RESPONSIBILITY

Responsible Investigator

I will be responsible for all radioactive material that is acquired under my authorization. Radioactive material will be used in accordance with the *Clemson University Radiation Safety and Waste Management Manual* which I have in my possession and in accordance with the conditions of authorization that will be issued to me. I shall require all personnel working under my authorization to adhere to the requirements of the Manual and the conditions of authorization.

Signature _____ Date _____

Department or Unit Head

I accept administrative responsibility for ensuring compliance with the requirements of the Radiation Safety Manual and conditions of authorization when they are issued.

Signature _____ Date _____

PERMISSION TO USE RADIOACTIVE MATERIAL IN ANOTHER DEPARTMENT

If radioactive material will be used or stored in any area that is under the administrative control of another department or section, permission must be obtained from the head of that department or section.

I approve of the use of radioactive material in my department or section as described in this application.

Department/Unit _____ Signature _____ Date _____

Department/Unit _____ Signature _____ Date _____

Please do not write below this line, for use by Radiation Safety only.

Date Application received: _____

Project number assigned _____

Protocol number assigned _____

Date Application Referred to RSC: _____

INSTRUCTIONS

For completing the *Application for Nonhuman Use of Radioactive Material*

GENERAL

Use a separate application for each protocol. Read the entire application before starting. Type the application if possible. Fill out all applicable sections. Check the boxes that are appropriate. If you have any questions, contact the Occupational and Environmental Safety and ask to speak with an RSO.

MATERIAL REQUESTED

Radionuclide - Radiation Safety Data Sheets are available from the Radiation Safety for the most commonly used radionuclides. Information can also be provided for other radionuclides.

Physical and Chemical Form - Try to use general categories of compounds. Do NOT use descriptions such as *any*.

TOO SPECIFIC	BETTER
alanine, methionine	amino acids and labeled proteins
thymidine, adenosine	nucleosides
ADP-Glucose	nucleotide sugars
ATP or GTP	Nucleotides
progesterone, estradiol	Steroids

Sealed Sources - Include a copy of any literature about the source or device that you want to have authorized.

Maximum Possession Limit - Justify the requested possession limit. For long half-lived radionuclides, the possession limit must be large enough to accommodate current shipments and long term storage of compounds that are not currently used. For short half-lived radionuclides, the possession limit usually needs to be significantly larger than the amount to be ordered each month to allow for arrival of new shipments before disposal of older shipments can be reported on the Radionuclide Inventory Report. Experience has shown that for short half-lived radionuclides such as P-32, the possession limit should be at least double the quantity ordered each month.

SUBMISSION AND PROCESSING OF APPLICATIONS

Submit completed applications to the Occupational and Environmental Safety (OES). Your application will be reviewed by the Radiation Safety Officer (RSO). RSO will contact applicant to schedule proposed site visit and discuss application. Application will be referred then for approval by the Clemson Radiation Safety Committee.