



## Environmental Health and Radiation Safety Radiation Safety Office

### **Obtaining Authorization to Use Radioactive Material in Research Labs**

#### **Authorized User Status**

Authorized Users are generally the principal investigators in laboratories using radioactive materials and are responsible for supervising the proper purchase, use, security, and disposal of radioactive materials within their individual laboratories. Authorized Users, along with the RSO, are responsible for the training of all others using radioactive materials within their individual laboratories. Authorized Users are subject to the directives of the Ohio Department of Health Ohio Administrative Code, the Radiation Safety Committee, the Radiation Safety Officer, and all University of Toledo policies and procedures. Authorized users will take action to restrict exposure to radioactive materials. This is in keeping with the need to limit exposure to as low as reasonable achievable

#### **To become an Authorized User, an individual must:**

- Be a full-time faculty member;
- Have a Ph.D. in biological, chemical, or engineering sciences;
- Have formal training or supervised laboratory experience (40 hours) on the use of radioactive material;
- Have formal training or supervised laboratory training on the hazards associated with the use of radioactive material;
- Complete the 3-Hour Radiation Safety Seminar;
- Complete the “Application for Use of Radioactive Material in Research Labs”;
- Receive approval for the University of Toledo Radiation Safety Committee.

## Application for Use of Radioactive Material in Research Labs

### Applicant Information:

Applicant Name: \_\_\_\_\_

Academic Rank: \_\_\_\_\_ Degree \_\_\_\_\_

Campus: \_\_\_\_\_ Department: \_\_\_\_\_

Office Building: \_\_\_\_\_ Room: \_\_\_\_\_ Phone: \_\_\_\_\_

Lab Building: \_\_\_\_\_ Room: \_\_\_\_\_ Phone: \_\_\_\_\_

### Courses in Radiation Safety/Radioactive Material Methodology

Course Title	When & Where Completed	Contact Hours
_____	_____	_____
_____	_____	_____
_____	_____	_____

### Experience with Radionuclides

Type	Place of Experience	Month & Year
_____	_____	_____
_____	_____	_____
_____	_____	_____

### Persons Who Will Routinely Use Radionuclides in the Lab (Must be at least 18 yrs. old)

Name	Position
_____	_____
_____	_____
_____	_____

Information on this page will be used to establish a 'Certificate of Use' specific to each approved user.

Applicant Name: \_\_\_\_\_

**1. UNSEALED SOURCES – RADIONUCLIDES**

RADIO NUCLIDE	SOLID, LIQUID OR GAS	CHEMICAL FORM	SOLUBLE OR NON- SOLUBLE IN WATER	VOLATILE, TOXIC, OR COMBUSTIBLE	MAXIMUM ACTIVITY (Millicurie or Microcurie)	
					PER YOUR ORDER	TOTAL IN YOUR LAB
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

**2. SEALED SOURCES (Encapsulated or Otherwise Sealed to Prevent Removal of Activity)**

RADIONUCLIDE	MANUFACTURER	ACTIVITY/DATE	SERIAL AND MODEL NUMBER
_____	_____	_____	_____
_____	_____	_____	_____

**\*\*IMPORTANT\*\***  
PLEASE READ AND SIGN THE FOLLOWING STATEMENT WHEN THIS FORM IS COMPLETED AND PRINTED

I, the undersigned, have read and understand the applicable NRC, State of Ohio (ODH), and University of Toledo Radiation Safety regulations, and agree to comply with the same in the handling and using of all sources of ionizing radiation.

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

**COMPLETE A SEPARATE PAGE FOR EACH PROJECT**

**Project Title:** \_\_\_\_\_

1. Radionuclide and form to be used: \_\_\_\_\_

2. Activity to be used per procedure (uCi or mCi): \_\_\_\_\_

3. Number of procedures to be done per month: \_\_\_\_\_

4. Duration of project: \_\_\_\_\_

5. What type(s) and quantity(s) of radioactive waste will you generate? (write below)

\_\_\_\_\_

6. Will you dispose of radioactive waste via sewer (sink)? \_\_\_\_\_

7. If animals are to be used, indicate: Type \_\_\_\_\_

Number \_\_\_\_\_

Maximum Activity (Microcuries/gram) \_\_\_\_\_

IACUC Approved Project Number \_\_\_\_\_

8. Use of volatile radionuclides requires an approved fume hood.  
Indicate room and hood to be used: \_\_\_\_\_

9. Use of high energy beta emitters and all gamma emitters requires a survey meter. No more than two approved users may share a meter.

Indicate: Make \_\_\_\_\_

Model \_\_\_\_\_

Probe Type \_\_\_\_\_

10. Use of high energy beta has been properly instructed for project protocols and radiation safety procedures.

Yes **Please Initial:** \_\_\_\_\_

11. Confirm that your staff has been properly instructed for project protocols and radiation safety procedures.

Yes **Please Initial:** \_\_\_\_\_

12. **Please provide a brief project description on the following page.**

**PLEASE PROVIDE A BRIEF PROJECT DESCRIPTION OF YOUR PROJECT:**

**EXAMPLE:** Project Title: Radiolabeled Vitamin C Uptake Inhibition Assay

P.I.: Jeffrey G. Sarver, Assistant Research Professor, College of Pharmacy

Vitamin C analogs will be assayed for their competitive inhibition of  $^{14}\text{C}$ -labeled vitamin C uptake in cells overexpressing the SVCT2 carrier-mediated vitamin C transporter. The methods used will be modeled after Dalpiaz et al (*European Journal of Pharmaceutical Sciences*, **24**, pp. 259-269, 2005) and Prasad et al (*Biochimica et Biophysica Acta*, **1369**, pp. 141-151, 1998). Human retinal pigment epithelium (HRPE) cells or human placental choriocarcinoma JAR cells will be seeded and grown to confluence in 96 well plates. The cell media will be replaced with uptake media containing 2.5-5.0  $\mu\text{M}$   $^{14}\text{C}$ -vitamin C (up to 6  $\mu\text{Ci}/\mu\text{M}$ ), along with 1 nM to 1mM of the vitamin C analog being tested, and cells will be incubated for 60 min. The uptake buffer will then be removed and the cells will be washed twice with ice-cold buffer. The cells will then be solubilized with 100  $\mu\text{l}$  per well 0.2 M NaOH containing 1% SDS surfactant, 150  $\mu\text{l}$  Packard Ultima Gold scintillation cocktail will be added to each well, plates will be sealed, and maintained in the College of Pharmacy. Inhibition of the  $^{14}\text{C}$ -vitamin C uptake will be analyzed by comparison of cell radioactivity to cells incubated without added vitamin C analogs. Inhibitory constants ( $K_i$  values) will be calculated for each of the vitamin C analogs being tested.

Up to six 96 well plates will be used in each assay procedure, with a total of 20-40  $\mu\text{Ci}$  of  $^{14}\text{C}$ -labeled vitamin C utilized per procedure. Liquid wastes (labeled uptake buffer and solubilized cells/scintillation cocktail) will be discarded down the sink, while solid wastes (96 well plates, labeled solution troughs, etc.) will be stored in a radioactive waste bin for appropriate disposal.

**Project title:** \_\_\_\_\_

**P.I.:** \_\_\_\_\_

Empty box for project description.