

UCDHSC COMMITTEE ON IONIZING RADIATION

Environmental Health and Safety Department

Office of the Assistant Vice Chancellor for Regulatory Compliance, Box F-484

Radioactive Materials Application for Non-Human Use

HSD-RSF-012

Rev. 1

CIR Application Number

I. Principal Investigator Name _____

(Refer to HSD Radiation Safety Manual, sections 2.4.2, 2.4.11 and 2.4.14)

Faculty Position _____ Department _____

II. Co-Investigator Name (should be Faculty) _____

Faculty Position _____ Department _____

III. Location of Use:

Building _____ Room Number(s) _____ Fume Hood Room Number _____
(If Applicable)

Biosafety Cabinet Room Number _____ Make _____ Model _____ Serial Number _____
(If Applicable)

Note: Use on University Hospital Property requires application to the University Hospital Radiation Safety Committee

IV. Radiation Workers:

(Refer to HSD Radiation Safety Manual sec. 2.4.8, 2.4.10, and 2.4.13)

1. _____ 2. _____

3. _____ 4. _____

5. _____ 6. _____

V. Radioactive Material and Amounts:

Isotope _____ Half-life of radioisotope _____ Maximum radiation energy (MeV) _____

Type of Decay (Alpha, Beta, Gamma) _____ Compound(s) _____

Radioactivity to be used per experiment (mCi): _____

Estimated number of experiments performed per month: _____

Radioactivity used per month (mCi): _____

Possession Limit (mCi) (Total radioactivity to have on-hand at any one time including waste and stock materials): _____

Yearly limit (mCi) (Total radioactivity requested for use during one calendar year): _____

VI. Principal Investigator Training and Experience:

A. Are you presently authorized as a Principal Investigator with other radioisotopes?

If Yes, please list authorizations below: for information, go to

<http://www.uchsc.edu/safety/RadiationSafety/RadioactiveAuthorizations.htm>

1. Authorization # _____ Radioisotope _____ Yearly limit (mCi) _____ Possession limit (mCi) _____
2. Authorization # _____ Radioisotope _____ Yearly limit (mCi) _____ Possession limit (mCi) _____
3. Authorization # _____ Radioisotope _____ Yearly limit (mCi) _____ Possession limit (mCi) _____

If No, you must pass the UCHSC certification test given by HSD. Date of certification: _____

B. Training Received in Basic Handling Techniques for Radioactive Materials

Note: If experience/training documentation is not attached, the Committee may not review this application. Below is NRC Form 313M Supplement A Equivalent.

Field of Training	Location and Date(s) of Training For Example...	Lecture or Laboratory Courses (Hours)	Supervised Laboratory Experience (Hours)
a. Radiation Physics and Instrumentation	<i>Case Western Research University, Cleveland, OH UCHSC, Denver, CO (module 1)</i>	<i>1 Hour 1 Hour</i>	5 Hours
b. Radiation Protection	<i>Case Western Research University, Cleveland, OH UCHSC, Denver, CO (module 3) UCHSC, Denver, CO (module 5) National Institute of Health, Baltimore, MD (attached certificate)</i>	<i>4 Hours 2 Hours 2 Hours</i>	20 Hours
c. Mathematics Pertaining to the Use and Measurement of Radioactivity	<i>Case Western Research University, Cleveland, OH UCHSC, Denver, CO (module 1) UCHSC, Denver, CO (module 2)</i>	<i>1 Hour 0.5 Hours 2.5 Hours</i>	1 Hour
d. Radiation Biology	<i>Geisinger Clinic, Danville, PA UCHSC, Denver, CO (module 4)</i>	<i>5 Hours 2 Hours</i>	<i>3 Hours</i>
e. Radio-pharmaceutical or Chemistry	<i>Colorado State University, Fort Collins, CO</i>	<i>3 Semester Hours</i>	<i>3 Hours</i>

C. Experience with Radiation and Radioactive Materials

Radionuclide(s)	Maximum Amount (mCi) Respectively	Where Experience was Gained For Example...	Duration of Experience	Type of use For Example...
<i>I-125, S-35, P-32</i>	<i>1, 10, and 5 mCi</i>	<i>Case Western Research University, OH</i>	<i>1984-1989</i>	<i>Labeling cells and nucleic acids for biochemical and molecular analysis.</i>
<i>P-32, S-35, C-14</i>	<i>2, 10, and 0.6 mCi</i>	<i>National Institute of Health, Baltimore, MD</i>	<i>1989-1991</i>	<i>In vitro protein labeling and sequencing. CAT assays.</i>
<i>P-32, S-35, H-3, I-125</i>	<i>5, 10, 20, and 1 mCi</i>	<i>Weis Center for Research, Geisinger Clinic, Danville, PA</i>	<i>1991-1995</i>	<i>End labeling oligonucleotides. Cell incorporation assays using tritiated thymidine. And cAMP kit assays.</i>
<i>I-125, Na-22</i>	<i>1 and 0.25 mCi</i>	<i>University of Colorado Health Sciences Center, Denver, CO</i>	<i>1995- Present</i>	<i>Na/H exchange assays. Iodination of growth hormones.</i>

VII. Plan of Investigation:

A. For In Vitro use: Yes _____ No _____

B. For Use in Animals: Yes _____ No _____

If Yes, please list Animal Protocol number (s): _____

If Yes, please describe plans for housing, marking cages and controlling waste products:

C. For Use in:	Infectious Organisms	Yes_____ No_____
	Cell Culture	Yes_____ No_____
	Animal Specimens	Yes_____ No_____
	Human Specimens	Yes_____ No_____
	rDNA or rRNA	Yes_____ No_____

If Yes to any of the above, please list any biosafety authorizations you hold (BSF-001, UCDHSC Biosafety Authorization form, <http://www.uchsc.edu/safety/Forms/BSForms.htm>):

If Yes to any of the above, please list the origin(s) of the cells or samples including cell line numbers (i.e. human, animal, primary, continuous):

D. Will the compound ever be in a volatile or unbound form? Yes_____ No_____

If Yes, please list the precautions that will be taken to control release and reduce exposure from these releases?

E. Description of Experiment Must be explicit and detailed and must include a list of the physical and chemical handling steps in which the radioactive material is involved, including identification of all reagents involved in potentially radioactive products or mixtures.

For Example:

32P DNA Oligonucleotide End-Labeling:

1. *In hood remove 32P-labeled nucleotide (ATP) from freezer box and let thaw in hood, behind shield. Heat heating block to 37 degrees C behind shield.*
 - 2.0 ul DNA*
 - 2.5 ul 10X PNK Buffer*
 - 5.75 ul H2O*
 - 12.5 ul 32P-ATP (125 uCi; 3000 Ci/mmol; 10 mCi/ml)*
2. *In 1.5 ml Eppendorf tube, combine the following for polynucleotide kinase reaction*
3. *Add gel sample buffer (95% formamide, 500 mM EDTA, 5 mg/ml bromophenol blue, 0.05% xylene cyanol FF) to sample*
4. *Load sample into 1-2 wells of a denaturing polyacrylamide/urea gel and electrophorese at 1500 V for 2 hours*
5. *Remove gel plates from apparatus. Cut of excess acrylamide lanes and blot gel of excess liquid. ETC...*

VIII. Exposure Control and Monitoring

A. Do you subscribe to the HSD radiation film badge service? Yes_____ No_____

Note: Film badges are not required for pure beta emitters with maximum energies less than 0.5 MeV.

B. Describe the methods and precautions which will be used to protect radiation workers from internal/external radiation exposure. Refer to HSD Radiation Safety manual, sec. 3.4.3, 3.4.4, 3.4.5, pages 42-60.

For Example:

- 1. Workers will maintain their exposure as low as practical.*
- 2. Film badge and ring dosimeter will be worn on the lapel of the lab coat when in the lab.*
- 3. No food or drink is allowed in the laboratory.*
- 4. Hands, shoes, coat, and skin will be surveyed before leaving the laboratory.*
- 5. When working with radioactive materials, workers will wear goggles, lab coats, eye protection, closed toed shoes and long pants.*
- 6. Protective barriers will be used to provide shielding and reduce potential exposure.*
- 7. Radioactive work will be performed within the confines of an approved certified fume hood.*
- 8. All work areas will have absorbent with non-permeable backing.*
- 9. Absorbent will be taped around the circumference with caution radioactive materials tape to designate work area.*
- 10. Equipment, cold storage, and waste storage areas will be labeled with Caution Radioactive Material labels.*
- 11. Bench top Plexiglass shields 1 cm thick, pipette shield, plexiglass waste bins and plexiglass storage boxes will be used*

C. Describe the precautions that will be taken to ensure security of all radioactive materials including waste and stock materials.

For Example:

- 1. Refrigerators and freezers storing radioactive materials will be locked.*
- 2. Waste containers will be stored in a locked cabinet.*
- 3. The door to the laboratory will be closed and locked when no one is in the laboratory.*
- 4. Laboratory personnel will notice and challenge everyone who enters the laboratory who is not associated with the laboratory.*

IX. Radiation Monitoring Refer to HSD Radiation Safety Manual, sections 3.4.3.1 and 3.4.3.2, pages 42-43

A. Portable survey instrument(s):

Note: Each PI, except those using only H-3, must own a portable radiation survey instrument.

Make_____ Model_____ Serial Number_____

Probe Model_____ Probe Serial Number_____

Make_____ Model_____ Serial Number_____

Probe Model_____ Probe Serial Number_____

B. Liquid Scintillation Counter:

Location_____ Make_____ Model_____ Serial Number_____

C. Gamma Counter:

Location _____ Make _____ Model _____ Serial Number _____

D. Frequency of Contamination Surveys (swipe tests):

Note: Documented surveys must be performed in accordance with the Laboratory Hazard Classification requirements (refer to HSD Radiation Safety Manual, Appendix XVI).

Daily _____ Weekly _____ Monthly _____

Location where survey records will be stored _____

X. Radioactive Waste Handling and Disposal

A. Describe the waste handling steps of the experiment

For Example:

All Eppendorf tips and tubes are deposited into a plastic container used exclusively for 32P waste kept behind a Plexiglass shield. This container is periodically emptied into the bulk dry radioactive waste. Used buffer and gel soaking solutions are collected in the liquid radioactive waste. The wrapped discarded gel, elution membranes and spin-X cartridges, and elution tips are disposed as solid waste. Miscible organic solutions, such as ethanol are collected as mixed waste. Vials containing organic solutions will be collected in vial trays as mixed waste.

B. Will you produce any chemical-radioactive mixed wastes? Yes _____ No _____

Refer to HSD Radioactive Waste Disposal Manual, sections II G and IV C, E and K for classification of mixed chemical and radioactive wastes.

If Yes, please justify production of this waste in this section and complete the “Organic” row in the table below.

C. Will you produce any infectious radioactive wastes that require disinfecting and collecting as biological non-carcass material? Yes _____ No _____

Note: All waste material that comes in contact with human samples or is potentially infectious, must be disinfected and classified as biological non-carcass waste. Refer to HSD Radioactive Waste Disposal Manual, sections II G and IV G and J for classification of biological non-carcass waste.

If Yes, please describe the method for disinfecting in this section and complete the “Biological (non-carcass)” row in the table below.

D. Anticipated waste forms, volumes, and percentages of total activity

Waste Type	Volume Generated per Month	% of Total Radioactivity	Requires Disinfecting*	
Dry Solids	(cubic feet)		yes	no
Aqueous	(gallons)		yes	no
Scintillation vials, (Please list Cocktail brand name if	(# of trays)		yes	no

applicable)			
Biological (non-carcass)	(cubic feet)		yes no
Biological (carcass)	(type and number of animals)		yes no
Organic (please justify in the comments section below)	(gallons)		yes no
Other			yes no

By my signature below, I agree that all radioactive materials procure as a result of this application will be used only as specified above, and in accord with the guidelines of the HSD Radiation Safety Manual, as well as all other applicable UCHSC policies and procedures, the UCHSC radioactive materials license, and state and federal regulation.

Signature of Principal Investigator _____ **Date** _____
 PI's telephone number _____ PI's mail container _____

Signature(s) of Co-Investigator _____ **Date** _____

DO NOT WRITE BELOW THIS LINE - FOR HEALTH AND SAFETY USE ONLY		
Principal Investigator	Has successfully completed the following modules	Mentor form
Co-Investigator	Has successfully completed the following modules	
Radiation Workers	Has successfully completed the following modules	WIT form
	Has successfully completed the following modules	WIT form
	Has successfully completed the following modules	WIT form
Film badge service -	<input type="checkbox"/> Film badge service not necessary with this radioisotope. <input type="checkbox"/> Film badge service has been ordered, Group # _____.	
Signature of HSD reviewer: _____ Date: _____		