



UNIVERSITY OF MASSACHUSETTS/AMHERST
ENVIRONMENTAL HEALTH & SAFETY
117 Draper Hall, 40 Campus Center Way
AMHERST, MA 01003-9244
413.545.2682
413.545.2600 fax

FROM: Radiation Safety Services
TO: Prospective Radiation User
SUBJECT: Request to Use Radioactive Material (RM) Here at UMASS

The use of RM is highly regulated at all levels from small research quantities to high exposure irradiators under a license issued by the Massachusetts Department of Public Health's Radiation Control Program (MRCP) sanctioned by the U.S. Nuclear Regulatory Commission under the Atomic Energy Act of 1954. At UMass Amherst, the peer review Radiation Use Committee (RUC) is responsible for setting radiation safety policy, ensuring that all regulations are followed and that all license conditions are met. As the Radiation Safety Officer, I am responsible to the RUC for assuring that all users and laboratory supervisors understand their responsibilities under our license and any state, federal or local regulatory agency requirements during inspections.

The following instructions and application forms as well as the Radiation Safety Manual are for your use in making a formal application to the Committee. Please return the completed form to me for review of regarding safety or regulatory concerns. After I review your application, I will forward your request via email to the RUC, which will review the entire application. The RUC may give you permission to begin your research with radioisotopes or radiation generating machines before voting on your application at the next quarterly RUC meeting via email or they may request further information before issuing a permit.

In any case, please be advised that ordering new stock or transferring radioisotopes, radiation generating machines, instruments containing radioactive sources such as a GC unit with an ECD or a liquid scintillation counter or other items that use or generate radiation onto campus before a permit is approved by the is a violation of our license and could lead to delays in your permit receiving approval from the RUC.

If you need any assistance in completing your application, please do not hesitate to call me.

Sincerely,

(Signature on file)

Vincent Chase
Radiation Safety Officer
Program Head, Radiation Safety Services
545-5153
vchase@ehs.umass.edu

RADIATION PERMIT APPLICATION INSTRUCTIONS

1. The person applying for Authorized Principle Investigator status must complete a "Radiation Permit Application". The application is reviewed by EH&S for radiation safety before it is forwarded for final approval by the Radioisotope Use Committee.
2. The Authorized Principle Investigator must submit a list of all personnel who will be using radioactive materials (RAM) in experimental procedures to EH&S (see Part B)
3. The Authorized Principle Investigator must complete a radiation safety profile to the Radiation Safety Officer for a safety review (Part B and Part C of this application) a copy of each experimental procedure (protocol) utilizing RAM under to be authorized under this permit.

For example, while dCT³²P and dAT³²P hybridization experiments may require only one protocol because of their similarity, two protocols would be needed for the I-125 permit where one experiment uses pre-packaged RIA kits and the second experiment involves radiosynthesis using Na¹²⁵I in the elemental form. For any experiment involving animals, a review by the UMass Amherst IACUC is required prior to the protocol being submitted to the RUC.

The protocol should include all instruments and equipment used during the procedure, the model and type of radiation generating machines, rooms or areas of rooms where radiation work will take place, maximum specific activity of labeled solution to be used and a brief step-by-step procedure with flow chart to determine handling hazards. Please list the reagents and volumes to be used.

4. All personnel to be working with RAM are required to attend a radiation safety training session conducted by EH&S prior to beginning work with RAM. Training dates and times are posted on the EH&S website: www.ehs.umass.edu. In addition, the Authorized Principal Investigator is required to complete
5. Each lab (or group of adjoining labs) where radioactive materials are in use will be supplied with a copy of the UMASS Radiation Safety Manual. The following signs must be posted in prominent locations where radiation workers can regularly read them:
 - a. Form MRCP "Notice to Employees"
 - b. The location of where laboratory personnel may obtain copies of 105 CMR 120.000 Regulations Title 10, "To Control the Radiation Hazards of RAM and of Machines which Emit Ionizing Radiation"
 - c. Pertinent safety memoranda and signs from EH&S.

In addition to the above posting, signs, stickers or tags reading "Caution Radioactive Materials" **must** be on each entrance to the room, on refrigerators or where radioactive materials are stored, on fume hoods or incubators that use radioactive materials and around the perimeter of the work bench or work area. All required postings may be obtained from EH&S.

6. Upon authorization and protocol review, the Radiation Safety Officer may request the researcher to perform a "Dry Run," i.e. run through the experimental procedure without using RAM. In any case, a member of the Radiation Safety Office will inspect the lab before work with RAM begins to assure that adequate safety precautions have been implemented as planned.

Reminders – As Referenced from the UMASS Radiation Safety Manual

- a. When ordering radioisotopes for experimental use, the order must be placed in the name of the Authorized Principal Investigator. EH&S must be notified of the order. All radioisotopes are delivered to the user by EH&S after receipt and inspection. After you place an order, you MUST notify EH&S using our website at www.ehs.umass.edu and then selecting "Radioactive Material Order Notification."
- b. Laboratories using or storing radioactive materials will be inspected for radioactive contamination on a regular basis by EH&S. If contamination is found, the lab will be notified by EH&S as to the location and nature of the contamination. It is the responsibility of laboratory personnel to clean any contaminated areas (except in extremely severe cases, like those involving a spill) at the end of an experiment or before leaving the laboratory at the end of the workday.

- c. Review the Emergency Procedures in the Radiation Safety Manual prior to beginning work with radioisotopes or radiation generating machines. Ensure that your entire staff who use the lab, especially those who are not working with radiation, know there are health and safety issues associated with radiation and that they are empowered to bring any laboratory or personal safety concerns directly to EH&S. The EH&S contact number is 545-2682.
- d. Please review all applicable waste disposal segregation procedures for your experiments. Please ensure that anyone who is listed as a radiation user under this permit is acquainted with the proper waste disposal procedures so that we may stay in compliance with very strict waste segregation, packaging and disposal regulations. All radioactive waste picked up will be picked up upon request by visiting our website at www.ehs.umass.edu and selecting "Hazardous Waste Pickup Request". Pickup may take place at any time during the day so it is important that your RAM waste be properly labeled (name, isotope, activity, and date) and packaged before pickup. Please feel free to contact EH&S for assistance in determining the proper holding.

The Radiation Safety Checklist (Part C) must be completed for all new permits and permit renewals.

**UNIVERSITY OF MASSACHUSETTS AMHERST
RADIATION PERMIT APPLICATION
PART A**

INSTRUCTIONS: Please complete all pertinent items, and forward to Radiation Safety Officer, EH&S, 117 Draper Hall, 40 Campus Center Way, Amherst MA 01003 Fax: 545-2600

1. _____
Name of Applicant Department Office Location Telephone

2. _____ Room Change
Room numbers where radiation will be used or stored **(Complete Part B only)**

3. Please place a check mark next to all the following that apply to this application:

 _____ Initial Application _____ Renewal _____ Increase limits _____ Remove nuclide
(^^^^ Complete Part B and Part C ^^^^^) (^^^^^^^^^^ Complete Part A only ^^^^^^^)

4. Radioisotope information. (Attach a supplementary sheet, if more space is needed.)

Nuclide ("X" for X-ray)	Activity Limits			Chemical compound or x-ray device	Experimental Use
	Per Shipment (mCi)	Per Experiment (mCi)	Total Lab Storage (mCi)		

5. Persons who will perform protocols or experiments on this permit.

6. Are there any non-radiation procedures, steps or chemical properties in your experiment that could effect safety? For example, volatile at room temperature, volatile during heating or incubation, cryogenic cooling, aerosols for dust or powder, under high vacuum, under high pressure, flammable, corrosive, poisonous, oxidizer, explosive, used with robot, etc.

____ YES ____ NO **(If YES, complete Part B.)**

7. Facility or lab equipment, check all that apply (If necessary contact the RSO for assistance)

- Refrigerators/freezers Cold/hot rooms Storage locations Fume hood Biosafety cabinet
- Incubators Heat baths/block Hand-held survey meter
- Lock box or refrigerator lock for isotope security

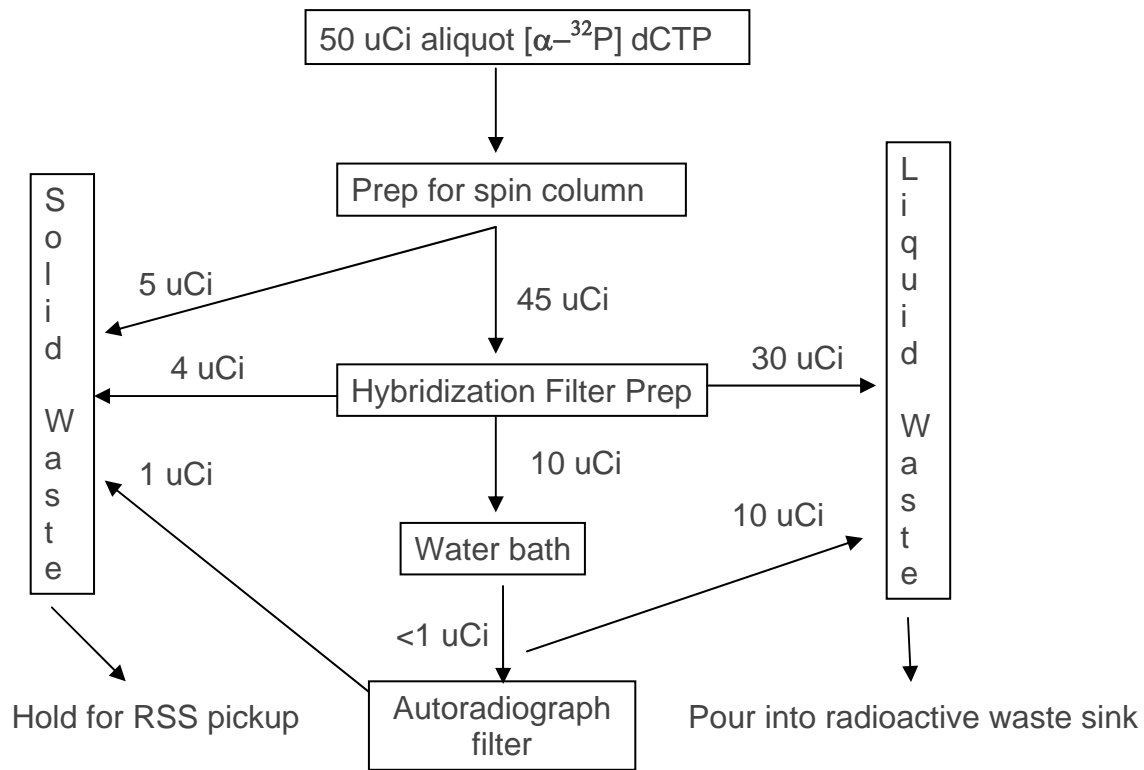
**UNIVERSITY OF MASSACHUSETTS AMHERST
RADIATION PERMIT APPLICATION
PART B**

Provide a brief, step-by-step description and a flow chart for each radionuclide and each different experiment or protocol to be approved under this permit.

Example Flow Chart Using ³²P Southern Hybridization Assay

Flow chart for random primer labeling of DNA probes with [α -³²P] dCTP for Southern hybridization analysis

Typical aliquot of 50 uCi for 1 ul of stock solution



Please note: Only the liquid waste and autoradiograph filter were measured using a liquid scintillation counter. All solid waste values were estimated by calculation or external measurement with a Geiger-Mueller hand-held meter.

End Example.

**UNIVERSITY OF MASSACHUSETTS AMHERST
RADIATION PERMIT APPLICATION
PART C**

RADIATION SAFETY CHECKLIST

Please complete all items below. After completing all items, please send this application with all forms and documents to EH&S, 117 Draper Hall

If you have any questions, please contact the RSO at ext 5-5153

- Part A & Part B, as required, of the *Radiation Permit Application* are complete and attached.
- I have personally reminded all persons listed on this permit that when working with radiation, they must use proper personal protective equipment; must not wear open-toes shoes, sandals, flip-flops or other open footwear; must not eat, drink, chew or apply cosmetics in the laboratory and must use radiation only in protocols or experiments listed herein that were approved by the Radiation Use Committee.
- Flowchart and brief description is attached for each protocol to be approved.
- Sink marked for disposal of liquid radioactive waste. No sink disposal
- Disposal log or reminder to adjust the inventory record is posted at waste sink. No sink disposal
- All radiation work areas, benches, instruments and devices are posted with warning signs or labels.
- Spill trays or absorbent pads are present on wet lab benches or work areas.
- Radioisotope storage areas (refrigerator, cabinets, etc) have locks or lock box inside.
- Appropriate waste containers (solid, LSC vial, etc) are available.
- All users have submitted the *Radiation Training Record* to EH&S and completed classroom training.
- I, as Approved Principal Investigator, have familiarized all laboratory personnel who will be using radiation on how to perform the protocols or experiments on this permit and with the radiation safety requirements or will do so prior to performing any protocols on this permit for the first time. I have instructed all laboratory personnel in the hazards associated with the use of radiation and have empowered them to bring any laboratory or personal safety concerns directly to EH&S.

Approved Principal Investigator (Print)	Signature	Date
Reviewed by Radiation Safety (Print)	Signature	Date
Authorized by Radiation Use Committee	Signature	Date