

COLUMBIA UNIVERSITY
PERMIT APPLICATION FOR NON-HUMAN USE OF RADIOACTIVE MATERIALS

This is an application for non-human (research) use of ionizing radiation and is required in order to receive a permit to be an Authorized User.

**For assistance, contact the Radiation Safety Office (RSO):
 CUMC / NYSPI – (212) 305-0303
 Morningside, Lamont, and Nevis – (212) 854-8749**

Please check one of the following boxes:

- New Application** **Amendment**

For amendments to a previously application, please provide only the info that is being changed. Indicate if an addition or deletion.

Please complete and submit this application electronically – Thank you!

1. AUTHORIZED USER (Complete for either NEW or AMENDMENT)

Name: _____ Title: _____
 Last First MI

Office Address: _____
 Department or Service Building Room No.

Office Phone: () _____ Cell Phone: () _____

Main Lab Phone: () _____

UNI and E-Mail Address: UNI: _____ Email: _____

Alternate Contact or Person Delegated To Act or Sign For You For Radiation Safety:

Name: _____ UNI: _____ Phone: _____

Contact Person for Radiation Badges: _____ UNI: _____

Check one box:

- No work authorized under my permit will be done when I am unavailable to supervise and all sources of radioactive material will be secured.
- When I am unavailable, the alternate person listed above is authorized to assume all duties of the Authorized User under my permit.

2. REQUESTED RAM USE AND STORAGE LOCATIONS

Use additional pages if needed.

Building	Room #	Phone #	Intended Use *

* For example, specify STORAGE if stocks will be stored in the room, WASTE if rad waste will be kept in the room (note – for hallway waste storage waste closets include the room number in the list), LAB for labs using rad, COUNTING if the room has counting equipment, etc. Other use names may be used and they may be used in combination like LAB, STORAGE, WASTE if one room has all three functions.

Hood will be used for radioactive work or storage? Yes No

Attach diagrams of rooms and/or facilities where the radioactivity will be used or stored. Include all waste storage rooms or areas. An example map is attached in Appendix A. A PowerPoint file with the example map is available from the Rad Safety Office if you wish to generate electronic maps (highly recommended to make future changes easy).

Note: contact the Radiation Safety Office to discuss the need for shielding or other special precautions before purchasing more than 100 mCi of any isotope.

3. RADIONUCLIDES TO BE USED

Complete the following for EACH radionuclide requested (use additional pages if needed):

Name of Radionuclide	Chemical Compound or Physical Form	Estimated Activity to be Ordered per Shipment (mCi)	Maximum Possession Limit on Permit (mCi)	Estimated Total Activity to be Ordered per Year (mCi)

4. Airborne Radioactive Materials

Will ANY radioactive materials become airborne through ANY of you normal experimental processes?

Yes No

If YES, please complete the attachment in Appendix B – *Evaluation of Airborne Radioactive Materials*.
If NO then skip Appendix B.

5. Procurement and Purchase of Radioactive Materials

List individuals authorized to submit purchase orders, place orders, or obtain radioactive material (include administrative people as well as any authorized users)

_____	_____
_____	_____
_____	_____

6. RADIATION DETECTION INSTRUMENT(S) TO BE USED

Authorized Users are responsible for purchasing and maintaining radiation detection equipment appropriate to the type(s) of radiation and/or radioactivity being used. List the types and model numbers of the equipment that are currently available or will be purchased prior to beginning rad work.

Analytical (LSC, etc.)		Survey Meters		
Type	Model No.	Type	Serial No.	Model No. & Detector

Analytical types can include liquid scintillation counters (LSC), gamma counters, etc. Survey meter types can include Geiger (GM), ion chambers (IC), etc. Detectors can include GM, beta scintillator, gamma scintillator, etc.

7. ADDITIONAL PERSONNEL

List all individuals to be added to your permit who will handle or use radioactive materials in your lab(s). Attach a New User Form for each individual; the form is shown in Appendix C. If new users are to be added in the future, simply complete the form in Appendix C – no need to resubmit this application.

All personnel listed in this table must complete Columbia University radiation safety training before they can use radioactive materials.

	Name	UNI
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Please provide the following information on additional sheets, or edit this file and provide your information in each section.

8. Personal Data and Experience

Describe your previous radiation safety training and experience. Include a list of isotopes, activities and types of experiments you performed. For example, indicate where you worked with radioactive materials in the past, the position(s) you held, any training you had, the isotopes and quantities used and briefly how the materials were used. A CV must be attached to the application for all new PIs.

9. Planned Operations with Radioactive Materials

Describe the overall scope and duration of your planned work with radioactive materials. Describe each experiment in sufficient detail so that the procedures, activities, and locations can be evaluated for exposure and contamination risks. For example, you may attach your protocol summary describing the steps and precautions to be used with radioactive materials in your experiments.

The following information must be included as a minimum for each protocol or experiment planned that uses radioactive materials:

1. Name of protocol or experiment (e.g. Northern Blot, DNA Labeling, etc.)
2. Isotope
3. Activity put into the experiment (e.g. μCi , mCi , etc.)
4. Estimated amount of total time spent handling radioactive material
5. A brief summary of the steps followed to perform the protocol or experiment

See Appendix D for examples of the type of information requested in this section.

10. Security of Radioactive Stocks

Describe how isotopes will be secured from unauthorized usage or removal from the place of storage. Indicate whether you will use a lockable place of storage, a lockable box attached inside a storage facility, or another security method for when the lab is unoccupied. *If someone can easily walk away with the storage container, it is not secure enough.* Contact the Radiation Safety Office to discuss alternative methods of securing stocks.

11. Hazard Evaluation

Describe the expected radiation dose to users from both internal and external exposure. Highlight any operation, which could, due to an accident, produce excessive radiation exposure or contamination. Indicate if an accident could generate airborne radioactive materials (see also Section 4).

12. Radiation Safety Practice

Describe the measures taken to minimize exposures and contamination. Describe any shielding, including the type of materials, dimensions, etc. Describe your laboratory work rules.

13. Radiation Monitoring

Describe monitoring procedures for radiation monitoring and surface contamination. Include types and degree of survey and frequency (e.g. during and after use checks are required by the Radiation Safety Manual and monthly lab surveys are required by NYC Dept. of Health).

14. Radioactive Waste Handling

Describe procedures for handling waste. Include how waste is processed in the lab, locations of collection and storage, and the chemical composition of the liquid waste. Explain how activity (or % of activity) is determined for each waste stream, i.e. solid/dry and/or liquid and/or liquid scintillation vials (LSV). Contact the Radiation Safety Office if you have any questions.

15. Signatures

The applicant certifies that the information provided in this Application is complete and correct and agrees that he/she will:

- A. Comply with all applicable federal, state and local laws and Columbia University policies regarding the safe use of radiation.
- B. Implement no changes in this Application without prior Radiation Safety Office approval.

PI / Permit Holder:

Print Name	Signature	Date

Approved by Radiation Safety Officer:

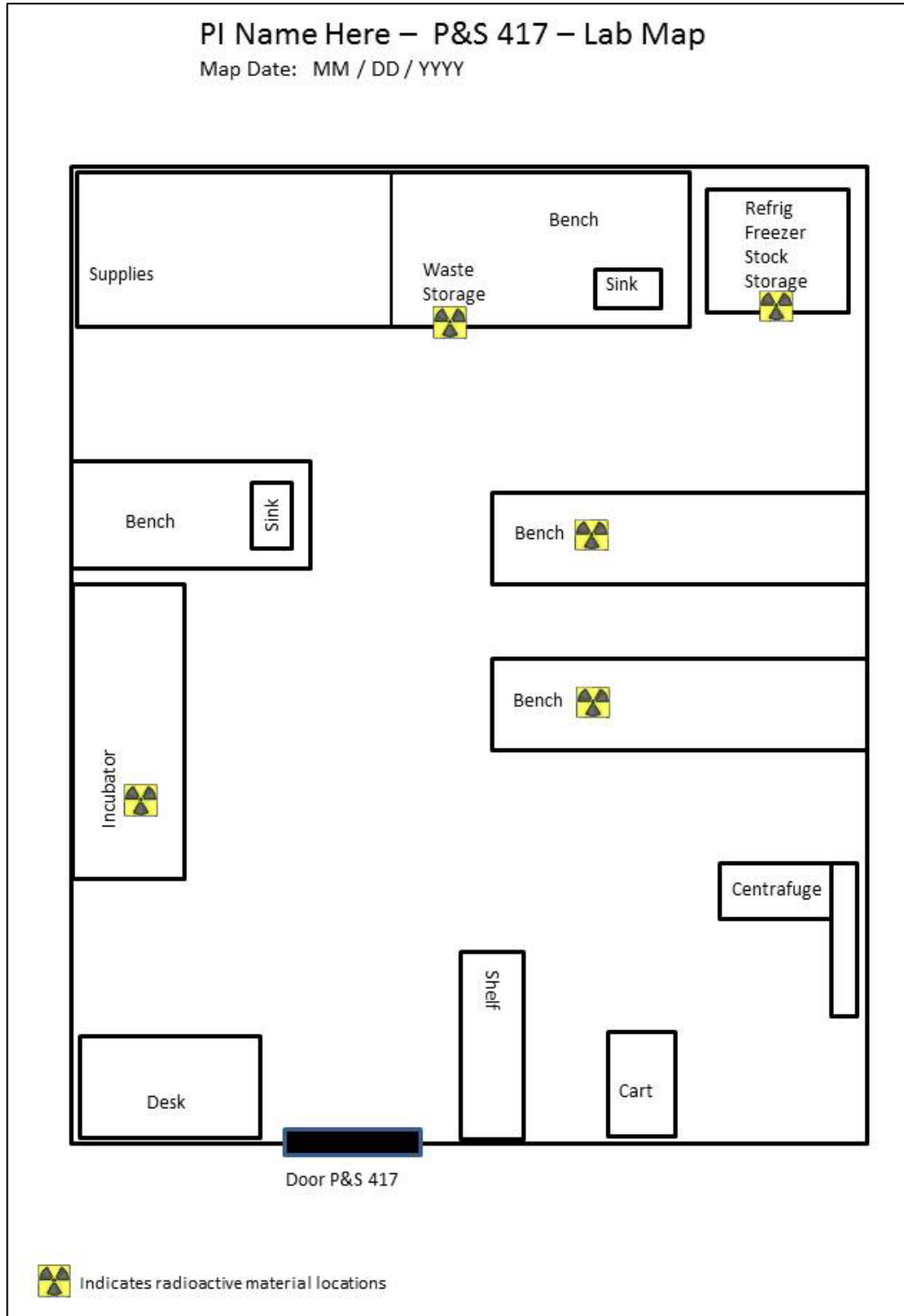
Print Name	Signature	Date

Approved by Chair of the Radiation Safety Committee:

Print Name	Signature	Date

(Note: RSC chair approval may be by email which is to be attached to this form)

Appendix A – Example Lab Layout Map to be Submitted With Application



Appendix B - Evaluation for Airborne Radioactive Materials

The New York State Department of Environmental Conservation Rules and Regulations 6 NYCRR 380 require Columbia to review and evaluate all releases of radioactivity to the environment. Releases through a laboratory ventilating and exhaust system above certain activities require permits. Releases to the working environment - lab, temperature controlled room, growth chamber, incubator, etc. - may not exceed certain activity limits. The information you provide in this form will assist the Radiation Safety Officer with this evaluation.

1. These are some ways that radioactive materials can become airborne; please indicate yours:

- Production or use of radioactive gas (e.g. methane, $^{14}\text{CO}_2$) _____
- Metabolism studies (e.g. ^{14}C applied to sample, $^{14}\text{CO}_2$ released) _____
- Volatile compound (e.g. Na^{125}I , $^3\text{H}_2\text{O}$, labeled solvents, Na-Borohydride) _____
- Aerosols (e.g. evaporation, animal excreta, homogenizing, blending, mixing, grinding, etc.) _____
- Other _____

2. What protocol(s) or experiment(s) in Section 9 of the application will produce airborne radioactivity?

3. Activity to be released:

Radioisotope	μCi per Exper	μCi per Year	Fume Hood Used (Y / N)	Chemical Form

4. If a fume hood is used indicate the location: Room # _____. Provide the dimensions (length_____ width_____ height_____) in units of _____.

5. If a fume hood is not used, what is the location of the lab, controlled-atmosphere room, incubator, growth chamber, green house, etc.? _____.

6. Provide a description of any traps or filters if used, but not previously described:

Appendix C – New User Form

RADIOACTIVE MATERIALS NEW USER APPLICATION

Please type or print clearly. Provide all required information on both sides and signatures or the form will be returned for completion.

Name: _____ Permit Holder: _____
(Last) (First) (MI)

Last 4 Digits

SS#: X X X – X X – _____ Work Phone: _____ UNI: _____

Age 18 years or more: Y N

Grad _____ Undergrad _____ Technician _____ Faculty _____ Other _____

Training: The dates of both Part 1 and Part 2 of the radiation safety course:

Columbia radiation safety course Part 1 on-line completion ____/____/____

Columbia radiation safety course Part 2 classroom completion ____/____/____

Certification (both signatures required)

I hereby declare that I received and understood the radiation safety training indicated on the above dates. I read and am familiar with the material in the Columbia University Radiation Safety Manual and the permit under which I will be authorized. I agree to abide by these requirements and any future amendments made to them

User Signature Date

I agree to take supervisory responsibility for this user. The user received an orientation on the conditions of my permit and on procedures for using radioactive material in my laboratory.

Permit Holder Signature Date

Appendix D – Example Protocol / Experiment Information for Section 9

In vivo labeling of viral DNA

³²P

Activity per experiment

Individual samples are labeled with 50 to 100 μ Ci

Typical experiment contains 3 to 10 samples

Approx 1 hour to complete

Radioactive inorganic phosphate is added to virus infected tissue culture samples in 24 well plates (1 ml volume per sample) (Rm. BB415). Following incubation in the media and cell samples are harvested by centrifugation in a microfuge (Rm. BB416). The DNA is then purified by protease K-phenol extraction procedures (Rm. BB417). Unincorporated label is stored as liquid waste.

Molecular weight markers

C-14

Activity per experiment

Typical experiment contains 1 sample of 10 μ Ci

Approx 120 minutes to complete

The radioactive labeled proteins (purchased) are fractionated by acrylamide gel electrophoresis (Rm. VC14), the gels dried (Rm. VC 14), and autoradiograms (Freezer in Plant Growth Area) prepared.

Sequencing of DNA with radioactive nucleotides

³⁵S or ³²P

Activities per experiment range from 15 to 30 μ Ci of ³⁵S or 15 to 75 μ Ci of ³²P labeled nucleotides

Approx 4 hrs long

The labeling is according to the Dideoxy Method. The label is added a reaction mix of less than 50 μ l and incubated at 37 C for 30 to 45 minutes. The samples are boiled and fractionated by gel electrophoresis (Rm. VC3), dried (Rm. VC4) and autoradiograms (freezer in Plant Growth Area) prepared. Unincorporated label in the electrophoresis buffer chamber is stored as liquid waste.