



## UNIVERSITY OF NEBRASKA MEDICAL CENTER APPLICATION FOR RADIOACTIVE MATERIAL LICENSE

### INSTRUCTIONS

**Initial application** - Complete all items.

**Renewal application** - Review entire application for accuracy and modify information as necessary. Indicate any new information or changes in the program (use supplemental sheets where necessary). **Items 14, 20 and 23 must be completed by all applicants.**

Please retain a copy of this application for your files. Upon approval of this application, you will receive a radioactive material license, issued in accordance with the requirements contained in the Nebraska Regulations for Control of Radiation-Ionizing, the Nebraska Radiation Control Act and the UNMC Radiation Safety Manual which is located on-line at <https://www.unmc.edu/ehs/>

1. NAME AND ADDRESS OF APPLICANT		2. BUILDING(S) AND ROOM(S) IN WHICH RADIOACTIVE MATERIAL WILL BE USED - Include location of liquid scintillation counter, gamma counter, walk-in freezer, etc.																								
Name: <input style="width: 90%;" type="text"/> Title: <input style="width: 90%;" type="text"/> Department: <input style="width: 90%;" type="text"/> UNMC Faculty? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Zip code: <input style="width: 100px;" type="text"/> UNMC E-mail: <input style="width: 90%;" type="text"/> UNMC Office Phone: <input style="width: 90%;" type="text"/> UNMC Main Lab Phone: <input style="width: 90%;" type="text"/>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #cccccc;"> <th style="width: 60%;">Building</th> <th style="width: 40%;">Room #</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table>		Building	Room #																						
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3. PROPOSED USE		4. TYPE OF APPLICATION																								
<input type="checkbox"/> In-vitro <input type="checkbox"/> In-vivo, animal use – attach Form RSO-35, “Research Using Radioactive Material in Animals”		<input type="checkbox"/> New license <input type="checkbox"/> Amendment to license number: <input style="width: 150px;" type="text"/> <input type="checkbox"/> Renewal of license number: <input style="width: 150px;" type="text"/>																								
5. RADIOACTIVE MATERIAL DATA																										
a. Element and mass number	b. Chemical/physical form	c. Max activity requested (mCi) *	d. Current protocol (must include)	e. Authorized use																						
1.			<input type="checkbox"/> Attached	<input type="checkbox"/> In-vitro <input type="checkbox"/> In-vivo																						
2.			<input type="checkbox"/> Attached	<input type="checkbox"/> In-vitro <input type="checkbox"/> In-vivo																						
3.			<input type="checkbox"/> Attached	<input type="checkbox"/> In-vitro <input type="checkbox"/> In-vivo																						
4.			<input type="checkbox"/> Attached	<input type="checkbox"/> In-vitro <input type="checkbox"/> In-vivo																						
5.			<input type="checkbox"/> Attached	<input type="checkbox"/> In-vitro <input type="checkbox"/> In-vivo																						
6.			<input type="checkbox"/> Attached	<input type="checkbox"/> In-vitro <input type="checkbox"/> In-vivo																						
7.			<input type="checkbox"/> Attached	<input type="checkbox"/> In-vitro <input type="checkbox"/> In-vivo																						
8.			<input type="checkbox"/> Attached	<input type="checkbox"/> In-vitro <input type="checkbox"/> In-vivo																						
<b>* This is the quantity you may possess at any <u>one</u> time, including waste that has not been picked up.</b>																										

**6. INITIAL UNMC RADIATION WORKER TRAINING** Refer to on-line Radiation Safety Manual, Section A-5

All Authorized Users applying for a UNMC radioactive material license (after 2015) must successfully complete the UNMC Initial Radiation Worker Training program (contact the Radiation Safety Office to enroll). Training consists of:

- a. Completion of an on-line self-study course covering the fundamentals of radiation safety.
- b. After completion of the on-line training, complete an in-class training session where specific instruction regarding the use of radioactive material at UNMC will be provided.

**RSO Use Only:** (Initial application after 2014)

Completion Date On-Line:

Completion Date Classroom:

RSO Initials:

**7. FORMAL TRAINING IN THE FUNDAMENTALS OF RADIOACTIVITY AND RADIATION PROTECTION**

Refer to the on-line Radiation Safety Manual, Section A-5

- a. List any degree(s) you possess and where obtained:

- b. **Instruction is required in:** Radiation Physics and Instrumentation, Radiation Protection, Mathematics Pertaining to the Use and Measurement of Radioactivity and Biological Effects of Radiation. **A total of 40 clock hours is required.** For classes that directly involve any of the above topics (e.g., Radiochemistry, Radiation Biology) one semester credit hour is equivalent to 16 clock hours. For other classes/instruction, a list of courses and their corresponding clock hours has been provided with your new user packet.

Formal course title	Location and dates of training	Clock hours in lecture or lab
<b>Total clock hours:</b>		

**8. EXPERIENCE WITH RADIATION** 160 hours experience in the safe handling of radioactive material is required. If possible, please supply name of Radiation Safety Officer (RSO) and/or phone number for each location.

Isotope	Maximum activity used	Types of use	Location and date(s) of experience/RSO contact

**9. SURVEY INSTRUMENTS** Refer to the Appendices in the Radiation Safety Manual

Manufacturer's name	Model	Probe type if applicable
		<input type="checkbox"/> Pancake GM <input type="checkbox"/> End Window GM <input type="checkbox"/> NaI <input type="checkbox"/> NA (Internal) <input checked="" type="checkbox"/> Other: O-O-S
		<input type="checkbox"/> Pancake GM <input type="checkbox"/> End Window GM <input type="checkbox"/> NaI <input type="checkbox"/> NA (Internal) <input type="checkbox"/> Other:
		<input type="checkbox"/> Pancake GM <input type="checkbox"/> End Window GM <input type="checkbox"/> NaI <input type="checkbox"/> NA (Internal) <input type="checkbox"/> Other:
		<input type="checkbox"/> Pancake GM <input type="checkbox"/> End Window GM <input type="checkbox"/> NaI <input type="checkbox"/> NA (Internal) <input type="checkbox"/> Other:
		<input type="checkbox"/> Pancake GM <input type="checkbox"/> End Window GM <input type="checkbox"/> NaI <input type="checkbox"/> NA (Internal) <input type="checkbox"/> Other:

**10. FIXED RADIATION DETECTION INSTRUMENTS** (i.e., liquid scintillation counter (LSC), gamma well counter,)

Manufacturer's name	Model	Type of Unit
		<input type="checkbox"/> LSC <input type="checkbox"/> Gamma Counter <input type="checkbox"/> Other: <span style="background-color: #f0f0f0; padding: 2px;"> </span>
		<input type="checkbox"/> LSC <input type="checkbox"/> Gamma Counter <input type="checkbox"/> Other: <span style="background-color: #f0f0f0; padding: 2px;"> </span>
		<input type="checkbox"/> LSC <input type="checkbox"/> Gamma Counter <input type="checkbox"/> Other: <span style="background-color: #f0f0f0; padding: 2px;"> </span>

**11. PERSONNEL MONITORING DEVICES (Radiation Badges)** Refer to the on-line Radiation Safety Manual, Section B-5.

Type of Badges Required:     Whole body badge     Extremity (ring) badge     None

Exchange frequency:     Biannually     Quarterly     Monthly

**12. FACILITIES AND EQUIPMENT**

Attach an explanatory sketch of laboratory facilities. Include location of hot sinks, storage containers, shielding, fume hoods, etc. Shade areas designated for radioisotope use.

**13. RADIATION PROTECTION PROGRAM**

Procedures and precautions which the Radiation Safety Committee finds acceptable for the safe use of common nuclides are specified in the Appendices of the Radiation Safety Manual. You may elect to follow these by checking the appropriate box or submit equivalent procedures which describe your situation.

<input type="checkbox"/> H-3 ..... Appendix 1 <input type="checkbox"/> C-14 ..... Appendix 2 <input type="checkbox"/> P-32 ..... Appendix 3 <input type="checkbox"/> S-35 ..... Appendix 4 <input type="checkbox"/> I-125 ..... Appendix 5 <input type="checkbox"/> I-131 ..... Appendix 6 <input type="checkbox"/> Ca-45 ..... Appendix 7	<input type="checkbox"/> Cr-51 ..... Appendix 8 <input type="checkbox"/> Y-90 ..... Appendix 9 <input type="checkbox"/> P-33 ..... Appendix 10 <input type="checkbox"/> Lu-177 ..... Appendix 11 <input type="checkbox"/> In-111 ..... Appendix 12 <input type="checkbox"/> Other (Specify): <span style="background-color: #f0f0f0; padding: 2px;"> </span>
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**14. SECURITY OF RADIOACTIVE MATERIAL** Describe the methods used to secure radioactive material from unauthorized removal when it is not under constant surveillance and immediate control of the user. Examples include: lock boxes in refrigerators, room locked when a radiation worker is not present, freezer/refrigerator locked when a radiation worker is not present.

Refrigerator/freezer &/or lockbox &/or room locked when a radiation worker is not present.

**15. LABORATORY CONTAMINATION WIPE SURVEYS** Refer to the on-line Radiation Safety Manual, Section B-6.

Based on the radionuclides and quantities used, contamination wipe surveys will be performed in the following rooms (indicated in Section 2) at the following intervals when radioactive material is used/stored:

Building	Room	Frequency of Wipe Surveys		
		<input type="checkbox"/> Monthly	<input type="checkbox"/> Weekly	<input type="checkbox"/> Other: <input type="text"/>
		<input type="checkbox"/> Monthly	<input type="checkbox"/> Weekly	<input type="checkbox"/> Other: <input type="text"/>
		<input type="checkbox"/> Monthly	<input type="checkbox"/> Weekly	<input type="checkbox"/> Other: <input type="text"/>
		<input type="checkbox"/> Monthly	<input type="checkbox"/> Weekly	<input type="checkbox"/> Other: <input type="text"/>
				<input type="text"/>
				<input type="text"/>
				<input type="text"/>
				<input type="text"/>

**16. BIOASSAYS** Refer to the on-line Radiation Safety Manual, Section B-5.

Are bioassays required for the activities requested?

- Yes, state radionuclide(s):  I-125  I-131  H-3  I-123  Other:  
 No

**17. HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC)**

a. Will high performance liquid chromatography (HPLC) be used under this authorization?

- No  Yes (Answer b - d)

b. What radionuclides are used in the HPLC:

c. Name the chemicals which are used as solvents (e.g., acetonitrile, water)

**NOTE:** Acetonitrile is an EPA-regulated chemical. Investigate alternatives

- d. Hazardous chemicals mixed with radioactive material (“Mixed Waste”) are extremely expensive to dispose of unless they are used in liquid scintillation counting and contain liquid scintillation fluid. **Are all the fractions collected used in liquid scintillation counting (e.g., does all HPLC radioactive waste contain liquid scintillation fluid)?**
- Yes       No (explain):

**18. EQUIPMENT CONTAINING INTERNAL RADIOACTIVE SOURCE (Non-LSC)**

- a. Will equipment be used that contains an internal radioactive source (e.g., Ni-63 for Gas Chromatograph)?  
**NOTE: Do NOT include liquid scintillation counters which are addressed in the next section (19).**
- No       Yes (Fill out table below)

Type of unit:	
Manufacturer:	
Model #:	
Serial #:	
Radionuclide:	
Source Activity (uCi):	
Assay Date:	
Serial or ID #:	

**19. LIQUID SCINTILLATION COUNTER (LSC)**

- a. Will a liquid scintillation counter (LSC) containing radioactive material (internal standard) be used under this authorization?  
**NOTE: Most LSCs use a radioactive internal standard to provide quench correction.**
- No       Yes (Answer b - e) Information for LSC TBD at time of need.
- b. Manufacturer of LSC:       Perkin Elmer/Packard       Beckman       Other:
- c. Model # of LSC:       d. Serial # of LSC:
- e. Radionuclide:       Cs-137       Ba-133m       Other:
- Activity (µCi):       Assay Date of Source:       Source Serial or ID #:
- f. Verification that cocktail used is non-flammable:       Yes       No (Contact Radiation Safety)

**20. WASTE MANAGEMENT**

- a. The Environmental Health and Safety Department will review your protocols for the generation of mixed waste (radioactive and EPA hazardous waste). Your laboratory protocols may be adjusted so as to minimize or eliminate the generation of EPA hazardous waste. For example, review your protocols to ensure the waste has a pH between 6.5 and 9 and/or ethanol is less than 24%. Call the Environmental Health and Safety Office at ext. 9-6356 if you have any questions.
- b. Describe the types of mixed waste (other than those specified in Item 15 – HPLC) that will be generated. Be as specific as possible. For example: *One liter per month of H-3 with methanol, 5% trichloroacetic acid and 4% water.*

**21. INFECTIOUS MATERIAL**

- a. Will infectious material (e.g., viruses, pathogens) be incorporated with the use of radioactive material?  
 No       Yes (Answer b)
- b. Describe the procedures that will be used to treat the waste to render it non-infectious (the UNMC Biosafety Committee provides guidelines in this area, refer to <https://www.unmc.edu/ibc/>):

**22. TRAINING FOR SUPERVISED INDIVIDUALS WORKING WITH RADIOACTIVE MATERIALS** Refer to the on-line Radiation Safety Manual, Section A-5.

List Radiation Workers	Completed Form RSO-29?	Enrolled in the personnel monitoring program?
	<input type="checkbox"/> On file at RSO <input type="checkbox"/> Attached	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> On file at RSO <input type="checkbox"/> Attached	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<input type="checkbox"/> On file at RSO <input type="checkbox"/> Attached	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<input type="checkbox"/> On file at RSO <input type="checkbox"/> Attached	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<input type="checkbox"/> On file at RSO <input type="checkbox"/> Attached	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<input type="checkbox"/> On file at RSO <input type="checkbox"/> Attached	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
	<input type="checkbox"/> On file at RSO <input type="checkbox"/> Attached	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A

**NOTE: Electronic signatures may be used. If you cannot sign electronically, please print out this page (only) and send to Radiation Safety either by scanning & emailing to Pam Cox or mailing via campus mail (Zip 5480) .**

<b>23. CERTIFICATE</b> This item must be completed by applicant	
a. The applicant named in Item 1.a. hereby certifies that this application is prepared in conformity with the University of Nebraska Medical Center Radiation Safety Manual, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of my knowledge and belief. Further, I have read the UNMC Radiation Safety Manual and will comply with sections relating to procurement, procedures, record keeping, radioactive material control and account training, surveys and reviews by the Radiation Safety Officer	
<input type="text"/>	<input type="text"/>
Signature of APPLICANT named in Item 1.a.	Date
b. Insofar as I am concerned, I find the proposed use of radioactive material and designated facilities and equipment in this application to be in agreement with the research endeavors of this department.	
<input type="text"/>	<input type="text"/>
Signature of DEPARTMENT CHAIRPERSON	Date

Reference Information:

License #:

Name:

Department:

Title: