ENVIRONMENTAL HEALTH AND SAFETY | RADIATION SAFETY

Instructions for Completing the RAM Application for Non-Human Use

1. Copy the file to your computer saving it with a new name. The document contains fields for the user to enter the requested information. Press the “Tab” key to move through the document fields. If a field is not applicable, enter “N/A” into the field. Check box fields may be marked by pressing the space bar when the field is selected. The user may cut and paste typed information into fields asking for descriptions. Please refer to the *UCD Radiation Safety Manual* and *UCD Radioactive Waste Disposal Manual* when completing the application.

2. Email the application as an attachment to EHS for preliminary review RadAppNH@ucdenver.edu.

3. EHS will email back a formal pre-review of comments and questions regarding each individual application. EHS can try to help you with any formatting problems.

4. If requested to revise your application, please send the revised application, addressing all pre-review comments via email to the applicable email address in item 2 above.

5. After the application goes through pre-review and is deemed appropriate it is sent to the Committee on Ionizing Radiation for review.

6. Upon CIR approval and prior to receiving the authorization document, the PI signature on the application is required.

These instructions pertain to the RAM Application For Non-Human Use (RSF-012) document only.

ENVIRONMENTAL HEALTH AND SAFETY | RADIATION SAFETY

Some items of the **Radioactive Materials Application for Non-Human Use (RSF-012)** require special attention to minimize delays in resolving comments by Committee reviewers. The following notes are keyed by number to respective items on the application form. Certain items have been left out of this guidance, as the requested information should be self-explanatory.

ITEM IV. Radioactive Material and Amounts
Entry of correct nuclear data is essential for convincing the CIR of your knowledge of the isotope's properties. If the information is not readily available to you contact EHS at x4-0345 for assistance.

Requested possession limits should show a reasonable and logical progression from the activity per experiment to the possession and yearly limits. The relationship should be reasonable in light of the proposed number of experiments per month. Possession limit requests exceeding twice the amount anticipated to be used in one month and yearly limits exceeding twelve times the monthly use will require some explanation as to why. If other considerations intervene (minimum amount of radioactivity available or economically available from the vendor, etc.) please explain.

ITEM V. Principal Investigator Training and Experience
The committee will review the qualifications of Principal Investigators. Section A. should list any current authorizations. Section B should list all the institutions that you have received radiation safety training from, including UCD's modular training exams. If you do not have formal experience or training in one particular category, you may leave it blank or print 'none'. Be sure to include any formal supervisory training experience in Section C.

ITEM VI. Section A through D
If you plan to use radioactivity in animals, please list your approved IACUC protocol number. Provide steps you will take for housing, cage marking and control of wastes. If you plan to use radioactivity in any item in Section C, be sure to list your Biosafety Authorization number and information on your cell lines. Volatile forms of radioactive materials require special handling and precautions to control releases and exposure should be noted in Section D.

ITEM VI. Section E. Description of Experiment
The plan of investigation should include a brief analogue to the methods section of a journal article, specifying the physical and chemical phases and conditions through which the radioisotope passes during the experiment. **That is, *you should give a resume of all the manipulations to be performed,* including reaction times/temperatures/volumes, the use of any laboratory appliances, and so on.**

Please be advised that photocopies of materials that were not written by the applicant for this purpose (lab notes, published standard protocols, manufacturers' instructions), are likely to generate a very adverse reaction from committee reviewers unless they are annotated in a way that reflects careful consideration. Reviewers look at this section with particular rigor in order to assess the applicant's understanding of the experiment, its hazards, and its generation of waste materials. Note that special details must be provided for:

- uses in animals,
- uses that are subject to concern about radioactivity in volatile forms (notably tritiated water and acetate, radioiodines not commercially pre-labeled onto proteins or other nonvolatile macromolecules, and sulfur-labeled amino acids),
- any handling step that may cause dispersal into air as an aerosol, including procedures such as centrifugation, sonication, homogenization, and opening sealed vessels of radioactive liquids, and
- any step involving the heating of radioactive materials
- any step involving infectious material used in BSL3

In this section you should define the unit "experiment" as it relates to "activity per experiment" in Item IV and provide a quantitative basis for the requested on-hand and annual limits stated in terms of projected numbers of

experiments. If the quantities in which the radioactive material must be purchased will affect the limits that you require, this consideration should be included in your justification.

ITEM VII. Exposure Control and Monitoring

Methods used to protect personnel should include means of contamination control (including but not necessarily limited to surveys, gloves and other protective apparel, absorbent paper and radioactive material marking tape on benches), and use of fume hoods when appropriate. Shielding and consideration of storage locations for stock and bulk waste materials should also be specified when appropriate (sizable quantities of gamma or high-energy beta emitters). **All of the requirements in sections 3.4.3, 3.4.4, and 3.4.5 of the *UCD Radiation Safety Manual* should be addressed to the extent that they apply.** Take care to avoid clearly inappropriate references, such as specifying shielding for tritium. Be sure to include a description that outlines every reasonable effort to reduce any potential effluent, like use of certified designated fume hood, traps, filtration, absorbent, or secondary containment. Consult EHS if in doubt about appropriate precautions for a given application.

RADIOIODINATIONS - if labeling with radioiodine is proposed, include explicit provisions for addressing the requirements set forth in the Radioiodine Bulletin And Iodination Suite Guidance Note, Appendix XI in the *Radiation Safety Manual*.

USE OF VOLATILE COMPOUNDS - tritiated water or volatile compounds like acetate or ethanol.

USE OF SULFUR LABELED METHIONINE – in some circumstances but in particular for initial thaw of stock or during incubation periods.

PROCEDURES THAT MAY GENERATE AEROSOL – homogenization, sonication, or other mechanical agitation.

ITEM VIII. Radiation Monitoring

Possession of portable survey instrument - If your application is for any radionuclide other than H-3, the Committee will require you to **POSSESS** an appropriate portable survey instrument, usually a thin-window GM, for ongoing survey uses, such as frequent checks of hands and lab coats for contamination, surveying locations of spills, etc. Refer to the *UCD Radiation Safety Manual*, section 3.4.3.1.

Frequency of surveys - Surveys should include swipe testing for removable radioactive contamination. Documented surveys must be performed in accordance with the requirements published in Appendix XV of the *Radiation Safety Manual*.

ITEM IX. Radioactive Waste Handling and Disposal

All radioactive waste disposal services are provided free of charge by EHS to all investigators whose grants are funded at the on-campus ICR rate. Waste identified during the experimental steps listed in Item VI, Section E (Description of Experiment) should be summarized in Section A under Item IX. Complete Table D for the applicable waste types identified in the experiment. Include estimated volumes generated per month and the amount of radioactivity expected in each waste type. For each waste form that requires disinfecting, a brief explanation of the method used to disinfect the waste must be included in Section C comments.

- For liquid scintillation wastes, the scintillation cocktail to be used must be identified by manufacturer and product name, and the estimates of radioactivity content are particularly important, as ANY scintillation fluid containing more than 0.05 mCi/ml OF ANY RADIONUCLIDE is likely to present a disposal problem.

- For any RAM contaminated organic solvent wastes or other mixed (radioactive and hazardous) wastes, the chemical nature of the waste should be clearly stated.

- For any experiment that involves human tissue or bodily fluids including blood, serum, or plasma; or pathogenic microorganisms, all wastes containing such materials *or having been in contact with such materials* will have to be disinfected, as stated in the *UCD Radioactive Waste Disposal Manual*. These considerations also apply to any use of human cells that are not proven free of human pathogens (contact the Biosafety Officer at x4-0235 for additional details).