9. GENERAL RULES FOR SAFE HANDLING OF RAM

9.1 LABORATORY RULES FOR THE SAFE USE OF RADIOACTIVE MATERIALS

Certain work habits are essential in minimizing personnel radiation doses and reducing the chance of accidental contamination. The following practices are required as a condition of our license to possess and use radioactive materials and they must be observed when working with unsealed radioactive materials:

- wear lab coats and disposable gloves at all times when handling unsealed RAM.
- wear personnel monitoring devices, if issued by Radiation Safety, while in areas where RAM is used or stored. Monitors should be stored in an area of normal background radiation during non–working hours.
- equipment used for RAM work such as seal–a–meals, gel dryers, glassware, etc., should be clearly labeled as radioactive.
- avoid contaminating objects such as telephones, light switches, water tap handles, doorknobs, etc.
- monitor work area, hands, shoes, and clothing for contamination after each procedure and before leaving area.
- dispose of radioactive waste only in specially designated and properly labeled containers. Dry waste must be disposed before it overflows. Promptly transfer waste containers with high levels of radioactivity to Radiation Safety.
- do not eat, drink, smoke, chew gum, apply cosmetics or store similar items in areas where radioactive materials or radiation sources are used or stored.
- Such activities may be allowed in separate, designated “break rooms”, provided strict adherence to the institutional policy Eating, Drinking and Related Activities in Laboratories, Revised April 30, 2010. This policy states that:
  - break rooms must be separated from the laboratory space and have floor to ceiling walls and a closed door,
  - only covered food or beverage items may be carried through the laboratory to a break room,
  - filling or rinsing of food or beverage containers in designated laboratory “wash sinks” is allowed only if no other sinks are available, if water in these sinks has been determined to be potable, and if the chosen sink area is not contaminated with hazardous materials and is not a designated radioactive materials disposal sink,
• food and beverage containers may not be stored in the laboratory and washed containers or utensils may not be dried on laboratory drying racks,

• refrigerators used for storing food or beverages should be dedicated to food only and should be located outside of the laboratory

• specific procedures must be developed by each laboratory director for the transport of covered food and beverage items through the lab and for use of a “wash sink”. These procedures must be maintained in the laboratory Environmental Health and Safety Manual (i.e. “Blue Book”), and be readily accessible for review and for inspection, and

• all individuals with access to the laboratory must be trained on this policy

• never pipette RAM by mouth.

• handle sources of RAM with tongs or tweezers if appropriate to the operation.

• hall freezers, freezers in common rooms, etc., must be kept locked at all times to ensure that RAM is secured against theft. Laboratories containing RAM stock and/or waste must also be kept locked when unattended to prevent RAM theft.

• significant activities of potential volatile RAM, e.g., sodium iodide, sodium borohydride, tritiated water, etc., must be used in a fume hood which has been tested and posted by Radiation Safety.

In addition, the following practices are strongly recommended in order to maintain personnel doses as low as reasonably achievable:

• all work involving unsealed RAM should be conducted on surfaces which have been covered with absorbent pads. Use easily discarded pads, absorbent on the top surface only, for containing and easily disposing of contamination.

• after each experiment involving unsealed RAM, monitor the area with a radiation survey instrument capable of detecting the radionuclide to identify areas of contamination. When using $^3$H, consider doing a wipe test for removable contamination in the area(s) of use.

• liquid RAM in glass or plastic containers other than those provided by Radiation Safety should have secondary plastic containers in case of breakage or leakage. Liquid waste containers should be capped when not in use.

• whenever possible, new procedures should first be performed with non–radioactive materials in order to discover and remedy potentially hazardous aspects of the procedure and to train personnel in the safe and efficient execution of the technique.
• as a general practice, procedures involving RAM should be confined to as small an area of a laboratory as is realistic and as far from desks as practical, thus limiting the affected area in cases of accidental contamination.

• all processes involving substantial activities should be conducted in a fume hood to provide an ample safety margin and to avoid the need of periodic bioassays (refer to bioassay Table 2 in Section 15).

• use appropriate shielding, e.g., lead for gamma–emitters, Plexiglas™ for high energy beta–emitters, lead/Plexiglas™ combination for gamma–/high energy beta–emitters, etc.

• decontamination supplies should be easily accessible to all personnel.

• floors should be kept clean and waxed.

9.2 GENERAL PRINCIPLES

The instructional manual *Training Manual for Users of Radioactive Material* specifies work practices and procedures that help to ensure that personnel exposures are maintained ALARA. In addition, various textbooks and handbooks treat the subject of safe handling of radioisotopes in detail. Examples of such sources available at the WU Medical School Library include:

