TABLE OF CONTENTS

INTRODUCTION ............................................................................................................. 3
DEFINITIONS ............................................................................................................... 3
POLICY AND RESPONSIBILITIES ................................................................................. 3
   PRINCIPAL INVESTIGATOR (PI) RESPONSIBILITY ...................................................... 3
   EMPLOYEE RESPONSIBILITY ................................................................................. 4
MEDICAL SURVEILLANCE .......................................................................................... 4
EMPLOYEE EDUCATION ............................................................................................ 4
LABORATORY PRACTICES, ENGINEERING CONTROLS, & PPE ............................... 4
OPERATIONAL PROCEDURES ................................................................................... 5
FACILITY RECOMMENDATIONS ............................................................................... 6
ANIMAL EXPERIMENTATION RECOMMENDATIONS ............................................... 7
EXPOSURE MONITORING .......................................................................................... 7
   OVERVIEW .............................................................................................................. 7
   PROCEDURES ....................................................................................................... 7
INTRODUCTION
The Medical University of South Carolina’s (MUSC’s) Guidelines for the Laboratory Use of Chemical Carcinogens are based upon the guidelines of the National Institute of Health and provide recommendations and requirements governing the use of chemical carcinogens in MUSC programs. All personnel using chemical carcinogens in the Laboratories, Nursing Stations or Scoperooms, of MUSC are expected to become familiar with these guidelines and to conduct their operations accordingly. The principle purpose of these guidelines is to assist the laboratory investigator and managers in the selection and use of safeguards that will ensure a safe and healthful environment in the use of chemical carcinogens at MUSC. The recommendations are designed to permit the necessary beneficial use of chemical carcinogens with minimum exposure to personnel, and are based upon established principles of safety for research laboratories.

DEFINITIONS
The Occupational Safety and Health Administration defines a potential occupational carcinogen as "any substance, combination, or mixture of substances which causes an increased incidence of benign and/or malignant neoplasm’s, or a substantial decrease in the latency period between exposure and onset of neoplasm’s in humans or in one or more experimental mammalian species as the result of any oral, respiratory or dermal exposure, or any other exposure which results in the induction of tumors at a site other than the site of administration. This definition also includes any substance which is metabolized into one or more potential occupational carcinogens by mammals." Investigators must give specific attention to the quantity of the chemical carcinogen to be used, the physical properties of the agent, the comparative carcinogenic potency, the type of experimental procedures that will be involved in the proposed use of carcinogens, and the engineering controls in the laboratory.

POLICY AND RESPONSIBILITIES
The use of chemical carcinogens shall be planned and performed in a manner to ensure that a safe and healthful environment is maintained. The objective of this policy is to reduce employee and environmental exposures to chemical carcinogens used in laboratories to the lowest practicable level.

Principal Investigator (PI)-Managers Responsibility
The PI or Unit Manager has the primary responsibility of:
1) Acquiring the knowledge and information needed to recognize and control chemical hazards in the laboratory.
2) Selecting and employing laboratory practices and engineering controls that reduce the potential for exposure to chemical carcinogens to the lowest practicable level.
3) Obtaining approval when required from his/her department chairman to conduct high-risk operations.
4) Informing employees for whom the investigator is responsible of potential hazards and instructing them in the use of laboratory practices.
5) Supervising the safety performance of the staff to ensure that required laboratory
practices and engineering controls are employed.

6) Reviewing safety data sheets with affected employees, and maintaining in an accessible location.

Employee Responsibility
Each employee is responsible for:

1) Knowing and complying with safety guidelines, regulations and procedures for the task assigned.
2) Reporting unsafe conditions to the principal investigator.
3) Reporting to the principal investigator or immediate supervisor all facts pertaining to every accident resulting in exposure to chemical carcinogens.

MEDICAL SURVEILLANCE
A medical program has been established to comply with OSHA regulations. Anyone whose work involves regular and/or frequent handling of toxicologically significant quantities of a chemical should consult with the Employee Health Services physician to determine if a regular schedule of medical surveillance is desirable. If air sampling is performed and the action level is exceeded, medical surveillance will be required annually. If the chemical carcinogen is regulated by OSHA, all prescribed medical surveillance requirements will be performed by Employee Health Services.

Individuals requiring first aid should report to Employee Health Services. EMS should be summoned by calling 792-4196 in those cases where individuals, because of their injury, are incapable of transporting themselves.

Employee Health Services insures that the following information is included in each employee’s record when occurring: reports of accidents which have resulted in inoculation of chemical carcinogens through skin penetration, swallowing of chemical carcinogens, and inhalation of chemical carcinogens.

EMPLOYEE EDUCATION
All employees working with, or who may be potentially exposed to, chemical carcinogens should receive sufficient information and training to enable them to work safely and understand the relative significance of potential hazards as they relate to them personally. This information is to be provided by persons qualified by training and experience such as supervisors and/or principal investigators. A review of the safety data sheet (SDS) is a required component of employee education.

LABORATORY PRACTICES, ENGINEERING CONTROLS, & PPE

• Laboratory clothing that protects street clothing shall be worn.

• Gloves, which are appropriate for the procedure, shall be worn.

• Disposable gloves shall be discarded after each use.
• Eye protection shall be available and used in the laboratory area.

• There shall be no eating, smoking, drinking, chewing of gum, application of cosmetics or storage of food or food containers in the laboratory.

• Mechanical pipetting aids shall always be used.

• Personnel shall wash their hands immediately after the completion of any procedure in which a chemical carcinogen has been used.

• Personnel shall wash, or if appropriate, shower, after an unscheduled exposure to a carcinogen.

• An emergency eyewash and shower shall be located within the confines of the laboratory using the chemical carcinogen.

OPERATIONAL PROCEDURES
The entrance to each work area where chemical carcinogens are used or stored shall be marked by a warning sign: Caution, Potential Cancer Hazard and Authorized Personnel Only.

Work areas where chemical carcinogens are used or stored shall be entered only by persons authorized by the principal investigator or his/her designee. Maintenance, housekeeping, and emergency personnel shall be advised of potential problems and hazards.

Access doors to work areas shall be kept closed while experiments are in progress.

Work surfaces on which chemical carcinogens are used shall be covered with stainless steel, plastic trays, dry absorbent plastic-backed paper, or other impervious material. Protective surfaces shall be decontaminated or disposed of after the procedure.

Procedures involving volatile chemical carcinogens or solid or liquid carcinogens which may result in the generation of aerosols shall only be conducted in a chemical fume hood, a class I biological safety cabinet, a glove box or other suitable containment equipment.

Tissue culture and other biological procedures involving chemical carcinogens may be conducted in class II, type B biological safety cabinets.

Vapors or aerosols produced by analytical instruments when used with chemical carcinogens shall be captured through local exhaust ventilation or be vented into a chemical fume hood or a class I biological safety cabinet.
All employees who wear respirators, or who may be required to wear respirators, must pass a pulmonary function test administered by Employee Health Services, be fit tested by Occupational Safety and Health and attend a Respiratory training course offered by Occupational Safety and Health. See the MUSC "Respiratory Protection Program Policy" for further details.

Chemical carcinogens shall be stored in an area or cabinet marked with the warning "Caution - Potential Cancer Hazard".

An inventory of stored chemical carcinogens shall be maintained indicating the quantities and dates of requisition.

Storage vessels of chemical carcinogens shall be marked with the warning "Caution - Potential Cancer Hazard".

Chemical carcinogens in the work area shall be limited to a one-week supply if not contained in storage areas or cabinets.

Chemical carcinogens to be transported must be placed in double containers with the outer container marked "Caution - Potential Cancer Hazard".

Housekeeping procedures, which suppress the formation of aerosols, such as use of a wet mop or a vacuum with a high efficiency particulate air (HEPA) filter, shall be used.

Vacuum systems, including water aspirators, shall be protected to prevent entry of chemical carcinogens into the system.

Contaminated materials shall be decontaminated or removed for subsequent disposal in compliance with federal, state and local regulations.

**FACILITY RECOMMENDATIONS**

Hand washing facilities with liquid soap and foot or elbow opened faucets shall be provided.

An emergency eye wash and/or shower unit must be provided in each laboratory, scope room.

Exhaust air from glove boxes shall be treated by filtration, reaction, absorption, electrostatic precipitation or incineration.

Mechanical exhaust ventilation systems should provide airflow from areas of lower contamination to areas of higher contamination and should not be recirculated to other areas of the building. When directional airflow cannot be provided, the use of chemical carcinogens should be restricted to lower risk activities.
ANIMAL EXPERIMENTATION RECOMMENDATIONS
Any use of chemical carcinogens in animal experiments must be explained by completing the IACUC protocol “Chemical Agents Appendix.”

Contaminated feed, feces, urine and bedding shall be handled in a controlled fashion.

Animal care personnel shall wear a completely closed jumpsuit, shoes or booties, head cover and gloves.

Personnel should shower when they leave animal care or dosage preparation areas.

Suitable respiratory protection should be worn when exposure to particulates or vapors exists.

EXPOSURE MONITORING
Occupational safety standards are based on personal exposure monitoring of employees who may be exposed to vapors as a regular part of their work. There are over 200 chemicals on OSHA’s Z list suspected and known carcinogens that requires employee personnel sampling by vapor monitor and can be measured for periods of time from 15 minutes to more than 8 hours.

Overview
Select the employees to be monitored and discuss the purpose of sampling. Inform the employees of when and where the sampling equipment will be removed. Stress the importance of not removing or tampering with the sampling equipment. Instruct the employees to notify their supervisor or the Occupational Safety and Health Programs (OSHP) if the sample media needs to be temporarily removed.

Procedures
- Cut or tear open the pouch at the notch at the top. Pull away from the pouch when tearing.
- Remove the monitoring badge from the package. Save the pouch and plastic bag.
- Clip near the breathing zone for personnel monitoring. For room monitoring, place at or about the breathing level.
- Record the “Start Time”
- Expose the monitor for the recommended time period. Do not obstruct the white membrane.
- Record the “Stop Time” (using the attached MUSC Personnel Sampling Form).
- Please fill in all requested information on the front of the “Ziploc” pouch, retaining
any necessary information for your records. Place the exposed monitor in the plastic bag and then in the “Ziploc” pouch. Make sure to close the ‘Ziploc” seal completely.

When results are received in OSHP Office, the original should be signed by the person who was monitored. A report copy will be posted in the area where the personnel’s sampling was performed and the original will be kept on file at the OSHP Office.