LABORATORY CHEMICAL HYGIENE PLAN TIPS AND CONSIDERATIONS

Prepared by: _____ **Date:** _____
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Reviewed by: _____ **Date:** _____
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Approved by: _____ **Date:** _____
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ANNUAL REVIEW:

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SUPERSEDES: Procedure titled _____

Applicability. This sample Laboratory Chemical Hygiene Plan (Plan) applies to laboratories or facilities with laboratories where employees routinely work with hazardous chemicals (that is, any chemical that can cause a physical or a health hazard) and are regulated under **OSHA's** Occupational Exposure to Hazardous Chemicals in Laboratories rule **(29 CFR 1910.1450).** OSHA requires such facilities to have a written chemical hygiene plan, and it must be made accessible to employees for review and include specific measures for protecting employees against chemical hazards.

The OSHA rule details what must be accomplished but allows employers to decide how to accomplish it. The regulation directs each employer to explain its path to lab safety in a written Chemical Hygiene Plan, developed by a specific individual or committee assigned to the task. The Plan must be capable of protecting employees from health hazards associated with hazardous chemicals in that laboratory and keeping exposures below the **permissible exposure limits (PELs) established by OSHA.**

This Plan focuses only on worker chemical safety and does not cover **bloodborne pathogens** requirements in detail; this is cover by **separate dedicated Blood Borne pathogen Policy**. Also, it does not cover any environmental rules related to solid or hazardous waste management, medical waste disposal, or discharges to the environment. It also does not apply to uses of hazardous chemicals or substances that do not meet the definition of laboratory use (for example, benzene, cadmium, and formaldehyde). In such cases, the employer must comply with the relevant rule for toxic substances (see **29 CFR 1910, subpart Z**) even if such use occurs in a laboratory**. It also does not apply to laboratory uses of hazardous chemicals that provide no potential for employee exposure, such as procedures using chemically impregnated test media such as Dip-and-Read tests and commercially prepared kits such as those used in performing pregnancy tests in which all of the reagents needed to conduct the test are contained in the kit.**

Related rules. The following workplace safety rules generally apply to laboratories, and the applicable components of each rule related to hazardous chemical safety should be incorporated into the Plan:

- 29 CFR 1910.132—Personal Protective Equipment (requirement for a hazard assessment)
- 29 CFR 1910.134—Respiratory Protection
- 29 CFR 1910.1200—Hazard Communication (especially labels and hazard warnings)
- 29 CFR 1910.1000—Air Contaminants
- 29 CFR 1910.1030—Bloodborne Pathogens

Elements of a Chemical Hygiene Plan. According to the federal *Occupational Exposure to Hazardous Chemicals in Laboratories* rule, the written Plan must contain the following elements:

- Standard operating procedures for lab work using hazardous substances
- Ways the employer will determine or measure employee exposure to hazardous substances
- Engineering controls, personal protective equipment (PPE), and hygiene practices that will be used to reduce employee exposure
- Specific measures to ensure that fume hoods and other protective equipment function properly
- Procedures to train employees to recognize hazards and protect themselves against them
- Criteria for requiring preapproval of a particular operation, procedure, or activity

- Explanations of when and how medical consultations and examinations will be provided to employees

- Additional protections for employees working with particularly hazardous substances, such as carcinogens or reproductive toxins

Meharry Medical College Consolidated Clinical Laboratories (MMCCCLs)
Laboratory Chemical Hygiene Plan

Plan last updated: 06/27/2024

Purpose: This Laboratory Chemical Hygiene Plan (known hereafter as the **"Plan"**) outlines the workplace safety and health measures for the safe use, storage, and disposal of hazardous chemicals in the laboratory. It is written to meet the specific safety and health requirements outlined in the federal regulation **29 CFR 1910.1450**, Occupational Exposure to Hazardous Chemicals in Laboratories.

Scope: This Plan applies to all personnel required to work in the lab(s) of Meharry Medical Consolidated Clinical Laboratories and who also use hazardous chemicals in a laboratory.

Chemical Hygiene Officer (CHO) Signature _____ Date _____

Laboratory Chemical Hygiene Plan
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PLAN ADMINISTRATION

EHS Office. The EHS Office personnel are qualified by training or experience and designated by the Office of General Counsel to provide technical guidance in the Plan's development and is authorized to implement and enforce the provisions of the Plan. The EHS Office or a person or persons designated by the EHS Office will provide all other personnel that work in the laboratory with health and safety information about the specific hazards found in the laboratory and assist laboratory workers in matters relating to chemical safety. The EHS Office can be contacted at extension 6642. The following are staff can be reached for help and support:

Jeff Mitchell, CIH

Environmental Health and Safety Officer
Dept. of Environmental Health & Safety
615.327.6642
jmitchell@mmc.edu

Chemical hygiene officer. The chemical hygiene officer (CHO)/Lab Supervisor will:

- Work with the EHS Officer and other employees to develop and implement appropriate chemical hygiene policies and practices.
- Monitor procurement, use, and disposal of chemicals used in the laboratory.
- See that appropriate audits are maintained.
- Help project directors develop precautions and adequate facilities.
- Know the current legal requirements concerning regulated substances.
- Seek ways to improve the chemical hygiene program.

The Chemical Hygiene Officer (CHO) in most cases will also be the Principal Investigator for the laboratory or designee. Yusra Othman is the Chemical Hygiene Officer for this laboratory.

Laboratory supervisor. The laboratory supervisor has overall responsibility for ensuring that workers comply with chemical hygiene requirements in the laboratory, including responsibility to:

- Ensure that workers know and follow the chemical hygiene rules that protective equipment is available and in working order, and that appropriate training has been provided.

- Provide regular, formal chemical hygiene and housekeeping inspections, including routine inspections of emergency equipment.

- Know the current legal requirements concerning regulated substances.
- Determine the required levels of protective apparel and equipment.
- Ensure that facilities and training for use of any material being ordered are adequate.

The Chemical Hygiene Officer will designate a laboratory supervisor. Atanu Khatua the Laboratory Supervisor (Molecular) for this laboratory to act as Safety Officer for MMCCCLs.

Laboratory worker. The laboratory worker will:
- Plan and conduct each operation in accordance with the chemical hygiene procedures in this Plan.
- Develop good personal chemical hygiene habits.

PLAN EVALUATION
The Chemical Hygiene/Safety Officer will **annually** review and evaluate the effectiveness of the Plan and update it as necessary to maintain its effectiveness. The CHO will sign and date to indicate the latest review of the Plan. The EHS Officer will conduct periodic audits to ensure the continued effectiveness of the Plan.

Definitions

Action level means a concentration for a specific airborne contaminant regulated under the workplace safety regulations calculated as an **8-hour time-weighted average**, which initiates certain required activities such as exposure monitoring and medical surveillance.

Chemical Hygiene Plan means a written program developed and implemented by the employer that sets forth procedures, equipment, personal protective equipment and work practices that (i) are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workplace and (ii) meets the requirements of **29 CFR 1910.1450(e)**.

Emergency means any occurrence such as, but not limited to, equipment failure, rupture of containers or failure of control equipment that results in an uncontrolled release of a hazardous chemical into the workplace.

Hazardous chemical means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may create a health hazard to exposed employees, or the chemical creates a physical hazard to employees.

Health hazard means a chemical that is a carcinogen, a toxic or highly toxic agent, reproductive toxin, irritant, corrosive, sensitizer, hepatotoxin, nephrotoxin, neurotoxin, an agent that acts on the hematopoietic systems, and an agent that can damage the lungs, skin, eyes, or mucous membranes.

Laboratory means a workplace where the laboratory use of hazardous chemicals occurs and where relatively small quantities of hazardous chemicals are used on a nonproduction basis.

Laboratory use of hazardous chemicals means handling or use of such chemicals in which:

- Chemical manipulations are carried out on a laboratory scale.
- Multiple chemical procedures or chemicals are used.
- The procedures involved are neither part of a production process nor in any way simulate a production process.
- Protective laboratory practices and equipment are available and in common use to minimize the potential for employee exposure to hazardous chemicals.

Permissible exposure limit (PEL) means regulated substances specified in the federal rules at **29 CFR Part 1910, subpart Z**, or corresponding state rules.

Physical hazard means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive), or water-reactive.

HAZARD IDENTIFICATION

Hazard Assessment

The Chemical Hygiene Officer will conduct a Hazard Assessment to identify potentially hazardous conditions, chemicals, and equipment that may cause potential exposure or injury to laboratory workers. The assessment will also identify and recommend hazard control procedures for safe chemical handling and PPE. Each chemical assessment will be recorded on the attached *Chemical Hazard Analysis Worksheet* in Appendix A of this Plan.

Completed or updated assessments must be attached to this Plan and kept on file in the laboratory. The Hazard Assessment will be used to develop safe work practices for each hazardous material or procedure found in the lab. Any new potential hazards associated with any change of procedures, new equipment, or new chemicals will be assessed and documented before being used by laboratory workers.

Particularly Hazardous Chemicals

This laboratory has adopted special rules and safe work practices for laboratory workers who handle or use particularly hazardous chemicals. Such chemicals include select carcinogens, reproductive toxins, and chemicals that have a high degree of acute toxicity.

Specific information about particularly hazardous chemicals is contained in SDSs which are maintained in hard copy form in the laboratory and/or in the electronic online database. A list of particularly hazardous chemicals used in the laboratory along with additional related safety information is located in the Appendix B of this Plan.

A chemical is considered particularly hazardous when the proposed work involves hazardous chemicals that meet one or more of the following criteria:

- Capable of causing severe, acute, or lethal effects upon exposure by any route
- Highly unstable or explosive when combined with other compounds in the procedure
- May undergo chemical or physical changes during routine use and generate by-products that may overcome standard control measures or may penetrate available PPE to cause severe, acute, or lethal injuries
- Present a unique hazard or are used in an operation that requires approval above the level of the laboratory supervisor

The Chemical Hygiene Officer/Designee is responsible for ensuring that appropriate precautions are taken when working with particularly hazardous chemicals.

Safe work practices

The Chemical Hygiene Officer will implement the following safe work practices for particularly hazardous chemicals used, handled, or stored at the laboratory:

- Control access to the laboratory through the use of appropriate signs that warn of the hazards and indicate the precautions or approvals necessary for entry.
- EHS Office will be contacted when needed to determine if medical surveillance may be warranted if toxicologically significant quantities of a particularly hazardous substance are used on a routine or frequent basis.
- Maintain an accurate record of the workers who use these substances and the amounts used and stored in the laboratory.
- EHS Office will be contacted for assistance with specialized waste disposal.
- Consider protecting work surfaces from contamination through the use of disposable, absorbent, plastic-backed paper. Replace paper when contaminated (plastic side down) and handle as hazardous waste.
- Use additional containment devices, such as shielding or protective filters, to safely handle, store, or protect equipment and workers when using these chemicals.

PPE

- Wear appropriate PPE, including gloves, eye/face protection, and other protective apparel or equipment, as needed. Apparel includes impervious gowns, aprons, or gauntlets.
- Remove all protective apparel and thoroughly wash hands, forearms, face, and neck upon completion of work and before leaving the laboratory.

Safety protocol

When one or more of the criteria above are met, the Chemical Hygiene Officer/Designee must develop a specific written safety protocol and submit it to EHS Office for review before beginning work. This safety protocol is located in Appendix B of this Plan.

The safety protocol should include:

- A thorough description of the chemical(s) to be used, including the potential physical and health effects
- A step-by-step review of the work to be performed
- A list of the available engineering controls and PPE
- Provisions for proper labeling, storage, and waste disposal
- Decontamination procedures
- Expected actions in the event of an emergency

Training

Evidence of employee training on the established safety protocol must be documented and kept on file with this Plan. Training documentation must include the date the training was provided and the names of personnel trained. This training record is located in Appendix C of this Plan, or an equivalent form may be used.

Exposure monitoring

The Chemical Hygiene Officer (CHO)/Designee will work with the EHS Officer to identify any potential needs for chemical exposure monitoring. The EHS Officer/Designee will identify specialized monitoring and chemical exposure needs as appropriate.

Chemical inventory

The Chemical Hygiene Officer (CHO)/Designee will perform an annual chemical inventory that lists all hazardous chemicals in the laboratory. The inventory (known as the “chemical list”) will be updated whenever new chemicals are introduced in the laboratory or when a new chemical hazard is identified.

Safety data sheets (SDSs) for chemicals used or stored at the facility will be used to assist with the chemical identification and communicate hazards of the hazardous chemical.

All chemicals used in the lab should be listed in the Meharry electronic online database of chemicals. The CHO/Designee must ensure that all chemicals are listed in the laboratory inventory along with it's Safety Data Sheet (SDS). Contact EHS Office (ext. 6642) for assistance. Click here for a link to the Meharry online database.

Container labeling

Each container of a hazardous chemical delivered to, used at, or shipped from the laboratory must be labeled with the following:

- Name, address, and telephone number of chemical supplier
- Product identifier
- Signal word
- Hazard statement(s)
- Precautionary statement(s)
- Pictogram(s)

All laboratory workers must be trained on the elements of the container labels of hazardous chemicals.

Container labels must be maintained in a legible condition. Manufacturers' labels must not be defaced or removed unless the container is immediately labeled with the same required information. Any container without a label or with an illegible label must be reported to the supervisor immediately.

Secondary or temporary storage containers must be labeled with the same information as the original container chemical label.

SDS

An SDS (Safety Data Sheet) will be maintained for each chemical used in the laboratory and will be readily available for laboratory workers' review. The SDSs will be used during the training of laboratory workers. All laboratory workers must be trained on the standard 16-section SDS format. Contact EHS Office (ext. 6642) for assistance. Click here for a link to the Meharry online database of SDS.

SAFE WORK PRACTICES

General practices

Laboratory supervisors must ensure that all personnel under their direction possess the requisite knowledge, training, and education to safely handle hazardous chemicals in the laboratory. All laboratory personnel are responsible for following appropriate work practices when using hazardous chemicals. Following are the general safe work practices that must be followed in all laboratory areas:

- Minimize all chemical exposures and do not underestimate the risk of exposure.
- Avoid unnecessary exposure to chemicals by any route (such as inhalation, skin, eyes, or needlestick).
- Keep food, beverages, cosmetics, and medication outside the lab.
- Protect your clothes and exposed skin by wearing laboratory coats and/or gowns.
- Open-toed shoes, sandals, shorts, and other apparel that leave skin exposed are not appropriate when handling potentially hazardous chemicals.
- Contaminated laboratory coats must not be worn outside the laboratory.
- Wear the appropriate gloves and eye/face protection whenever handling hazardous chemicals; these items should not be worn outside the laboratory.
- Ensure unimpeded access to safety showers and eyewash stations.
- Test-flush eyewash stations weekly.
- Remove gloves carefully and use the proper procedure.
- Thoroughly wash hands and forearms after finishing work and before leaving the laboratory.
- Use only an approved chemical fume hood when opening, pouring, or handling hazardous chemicals.
- Keep all doors to the laboratory closed when working with hazardous chemicals in a fume hood; open laboratory doors can degrade hood performance.
- Do not use or store chemicals or compressed gas in cold rooms since they have contained, recirculated atmospheres.
- Never pipette by mouth.
- Transport laboratory chemicals using bottle carriers and suitable carts.
- Follow the established procedures for the decontamination and safe movement of scientific and medical equipment.
- Maintain proper oversight of inexperienced personnel working with potentially hazardous chemicals.
- Remove hazardous materials from equipment or facilities to be serviced and forewarn service personnel of the need for PPE or work practices.
- Decontaminate equipment when possible; notify a supervisor if the equipment could not be properly decontaminated.
- Follow the hazardous material spill procedure immediately in the event of a hazardous chemical spill.

Chemical fume hood safe practices

The chemical fume hood will provide adequate containment for most chemical operations. Workers will comply with the following safety procedures when using fume hoods:

- Conduct all work within the chemical fume hood at a distance of at least **6 inches** behind the face opening, and position the vertical sliding sash as low as possible while working to ensure capture of the chemical vapors.
- Avoid blocking the airfoil, baffles, and rear ventilation slot.

- Minimize foot traffic around the hood during use, since passing in front of the hood during operation disrupts the airflow and may pull contaminants out of the hood.
- Do not use the fume hood for storage. Contact EHS Office for prior approval if large equipment needs to be stored or positioned inside a fume hood.

PURCHASE OF HAZARDOUS CHEMICALS

Following are the guidelines for purchasing hazardous chemicals for laboratory use:

- Purchase only what you can reasonably expect to use.
- Buy what you specifically need. It is often possible to buy premade molar and normal solutions, thereby reducing the likelihood of waste.
- Purchase containers in the smallest practical size. Although the cost may be slightly greater, significant savings are realized in reduced disposal cost and safer storage.
- Purchase chemicals in plastic containers and avoid glass containers; if this is not possible, purchase shatter-resistant plastic-coated bottles.
- Read container labels; most of the information that you will need to handle and store the chemical is found on the manufacturer's label.
- Obtain and read the SDS for each of the chemicals that you use.
- Rotate the chemical inventory. Indicate the date received, the date opened, and pay particular attention to the expiration date. Stored chemicals should be inspected periodically for deterioration and container integrity. For example, **ether must be dated twice**: once when it is received and again when it is opened. It should be discarded as chemical **waste 6 months after opening.**

STORAGE OF HAZARDOUS CHEMICALS

The procedures below must be followed when storing hazardous chemicals in the laboratory:

- Temperature-sensitive, volatile, or flammable chemicals must be kept in explosion-safe or explosion-proof refrigerators, as appropriate.
- All flammable chemicals must be stored in an approved flammable storage cabinet.
- All hazardous laboratory chemicals must be stored below eye level. This procedure greatly reduces the likelihood of something falling from above, breaking, and contaminating the laboratory or causing eye or other injuries.
- Avoid placing any chemical container in direct sunlight or near heat sources.
- Store hazardous chemicals in cabinets with doors rather than on open shelves, where possible.

- Do not store chemicals on laboratory bench tops or in chemical fume hoods.
- Keep all chemical containers off floors, carts, and electrical equipment.
- Segregate chemicals into their respective hazard categories: corrosive, flammable, reactive, or toxic. Physically separate incompatible chemicals.
- Hazardous substances must be kept in an area designated for their storage and use.

Fume hood storage
Do not store chemicals or equipment in the hood since these items can block the air slots and compromise the operation of the hood. Shelving units specifically designed to be used in chemical fume hoods are available when authorized for such use. Contact the EHS Office (extension 6642) for assistance.

DISPOSAL OF HAZARDOUS CHEMICALS

Following are the procedures for disposing of hazardous chemicals:

- Do not dispose of chemicals down the drain or by evaporation.
- Properly collect, tag, and date waste.
- Keep chemical waste containers closed and sealed.
- Use drip pans under waste collection containers to prevent spills.

Contact the EHS Office (extension 6642) for assistance.

EXPOSURE CONTROL

This facility will ensure that any employee exposures to airborne contaminants in the laboratory do not exceed the potentially exposure limits (PELs) or the recommended threshold limit values (TLVs) when there is no PEL.

Hazardous chemicals may be used only in laboratory facilities specifically designed and engineered for such work. They may not be used in areas where their use is prohibited, including offices, storage rooms, shared equipment areas, cold rooms, and other areas lacking the appropriate hazard control facilities and a proper means of ventilation.

Ventilation systems
Local exhaust ventilation systems such as fume hoods and slot hoods are the primary method of controlling airborne exposure to hazardous chemicals in the laboratory.

All fume hoods must meet the minimum fume hood design specifications. Contact the EHS Office (extension 6642) for more information about the design specifications.

Do not make any alteration affecting a local exhaust ventilation system or associated ductwork. Ductless chemical fume hoods are not to be used in laboratories for use with hazardous chemicals. Captured organic vapors begin to desorb from ductless chemical fume hood charcoal filters shortly after adsorption occurs, and some degree of breakthrough or failure to capture occurs during introduction of vapor into the hood.

Chemical-sensitive personnel
Personnel who are pregnant or considering becoming pregnant may have special concerns about working with chemicals that have potential reproductive hazards. Such concerns can be discussed with a supervisor or an Occupational Health Physician.

PPE
PPE is an essential means of worker protection and will be used in combination with physical containment devices such as fume hoods at our laboratory.
All types of PPE, including chemical resistant gloves, aprons, eye and face protection, and respirators, will be provided to all affected personnel, as required.

General PPE practices
Laboratory workers must:
- Wear gloves whenever there is a potential for direct skin contact with blood, hazardous chemicals, or infectious materials.
- Wear lab coats only in the laboratory area and button them to protect clothing.
- Wear an impervious apron in areas where there is a high risk for chemical splashes.
- Remove all PPE immediately after leaving the work areas (or as soon as possible)
- Wear masks and eye protection or chin-length face shields to prevent contamination from splashes or sprays of blood, infectious materials, or hazardous chemicals whenever there is a potential for eye, nose, or mouth contamination.

Follow all project- or area-specific PPE requirements.

Gloves
Disposable gloves are one of the most commonly used types of PPE. The proper use of disposable gloves provides protection to the wearer by providing a barrier to potential hazards and product protection. All laboratory personnel are responsible for following the appropriate work practices when using disposable gloves. All workers must follow safe work practices when using gloves. Example practices include:
- Remove gloves carefully and use the proper procedure.
- Thoroughly wash hands and forearms upon completion of work and before leaving the laboratory.
- Do not reuse disposable gloves.
- Disposable gloves that become visibly contaminated or are suspected of being contaminated with hazardous materials must be replaced as soon as possible.
- Gloves contaminated with hazardous materials must be disposed of in accordance with laboratory waste disposal rules and policies.
- All used disposable gloves must be treated as potentially contaminated and disposed of appropriately.
- Gloves must not be worn in common-use areas except in emergency situations or in rare situations when conditions warrant their use.

Safety glasses
Safety glasses, goggles and face shields are available and must be worn if there is a potential for a chemical splash.

Respirators
This facility will provide, at no cost to the employee, respiratory protection when:

- The best available engineering controls fail to adequately reduce employee exposure to respiratory hazards.
- Substitution of respiratory hazards with less hazardous elements is not feasible.
- Modifications in hazardous operations fail to reduce exposures to below regulated or acceptable levels.

Tight fitting elastomeric respirators must not be used in the laboratory without prior approval by the EHS Office. Surgical masks are not respirators and may be used whenever needed. However, filtering face pieces (N95 or higher) or dust masks are respirators and require prior approval.

Laboratory workers must contact the EHS Office (extension 6642) if they feel their approved respiratory protection is inadequate.

EMERGENCY RESPONSE

Emergency Preparedness Plan (EPP)
Meharry Medical College has developed an emergency preparedness plan and evacuation procedures for this facility. The EPP is posted on the Meharry Intranet or you can contact the EHS Office for a copy.

Spill response
This facility has developed procedures for responding to large and small chemical spills in the laboratory.

Large spill
The following procedure must be followed by all employees when a large spill that involves more than **5 Liters** of hazardous chemicals has occurred:

1. Immediately notify Security at extension 6254 and EHS Office at 6642.
2. Contain the spill with available equipment (e.g., pads, booms, and absorbent).
3. Secure the area and alert other site personnel.
4. Do not attempt to clean the spill unless trained to do so.
5. Attend to injured personnel and call the medical emergency number **(extension 6666)**, if required.
6. Evacuate the building as necessary.

Small spill
The following procedure will be followed by all employees when a small chemical spill that involves less than **5 liters** has occurred:

1. Notify the Chemical Hygiene Officer or Laboratory Supervisor

2. If toxic fumes are present, secure the area (with caution tape or cones) to prevent other personnel from entering.
3. Deal with the spill in accordance with the instructions described in the SDS.
4. Small spills must be handled in a safe manner while wearing the proper PPE.
5. Review the general spill cleanup procedures.

First aid

Meharry Medical College including MMCCCLs will provide prompt emergency medical services and first-aid support to all personnel at the workplace who are injured or become ill. All Departments should maintain basic emergency equipment that might be needed in order to continue operations in the event of an emergency. Emergency kits/ First aid kit, included bandage, disinfectant, and basic first aid supplies.

If an incident requires outside assistance, Security is notified immediately by dialing **"6666"** and they, in turn, call the **"911"** emergency call system for outside assistance. If Security cannot be reached, the reporting party should call **9-911** directly.

Power Outage Procedures

Loss of electric power in the laboratory can be caused by extreme weather, rolling black outs or equipment malfunction. It is imperative to develop a plan to protect costly biological specimens, vaccines, and highly temperature-sensitive products stored in laboratory freezers and refrigerators. Rising temperatures may produce safety issues related to refrigerated chemical hazards involving fire, explosion and chemical toxin exposure. Advance planning in anticipation of power failures will reduce loss of research materials and improve safety.

Before Power outage.

Principal Investigators must develop an emergency plan to protect biological specimens, temperature-sensitive reagents and safe handling of hazardous chemicals. Designate contact persons who should be familiar with the laboratory and have adequate knowledge of the specimens, chemicals and procedures performed in the laboratory. Ensure that all laboratory personnel are familiar with the emergency procedures.

Make sure freezers and refrigerators containing critical research materials are on **the emergency power grid.**

For other freezers, fill empty spaces with ice packs. Filled space helps maintain internal temperatures

List all equipment's (with locations) containing your specimens.

Identify backup freezers/refrigerators or liquid nitrogen storage tanks in case you have to transfer your specimens.

Use Lab-Safe (or Explosion-Safe) refrigerators for storing volatile chemicals that require refrigeration. This will minimize the danger of an explosion if rising temperatures cause vapors to accumulate within the equipment and ignite when power is restored.
Know where your battery-powered flashlights are located.

Notification of Power outage

Power outages, which occur during daylight:

a. Alert faculty, staff, students and guests to the loss of power.
b. Call Campus Security or Campus Operations reference the cause of outage, if known.
c. Activities in academic departments may continue as normal, however, science laboratory facilities lab/research activities **must** cease.
d. Emergency lighting will probably last less than one hour – move to ground level immediately.

Power outages, which occur without daylight:

a. Alert faculty, students, staff and guests of the loss of power and the requirement to vacate the area.
b. To the best of your ability, obtain a head count, confirming the count after all members have relocated out of their respective areas.
c. Convene to pre-determined assembly area.
d. Notify Campus Security of those unaccounted or who did not evacuate from their location

During the Power Outage

Keep the freezer and refrigerator doors closed as much as possible. If you have to move your specimens, make a list of specimens transferred to backup freezers and refrigerators.
Do not use dry ice in walk-in refrigerators/cold rooms because hazardous concentrations of carbon dioxide gas will accumulate.

When Power is Restored

Be aware of unusual odors and vapors as this could be a sign of a leak or spill. Follow lab procedures for handling spills.
Reset freezer alarms if needed.
Advance planning in anticipation of power failures will reduce its negative impact on your research and improve safety.

MEDICAL EXAMINATION AND INFORMATION

Meharry Medical College will provide medical consultation and medical exams for laboratory workers who are or may be exposed to hazardous chemicals. All medical examinations and procedures are performed by or under the supervision of a licensed physician. The examinations

and consultations will be performed at no cost to the employee, without loss of pay, and at a time and place reasonable to the employee.

Evaluation criteria
An employee will be sent for medical examination when either:

- The employee develops signs or symptoms associated with a hazardous chemical exposure;
- Exposure monitoring reveals an exposure level routinely above the action level; *or*
- An event takes place in the work area, such as a spill, leak, or an explosion, resulting in hazardous chemical exposure.

Exposure information
The Chemical Hygiene Officer/Designee will provide the following information to the attending physician:

- The identity of the hazardous chemicals to which the employee may have been exposed;
- A description of the conditions under which the exposure occurred, including quantitative exposure data, when available;
- A description of the signs and symptoms of the exposure; *and*
- Copies of SDSs for the chemicals to which the employee was potentially exposed.

Physician responsibilities
The physician will provide to the Chemical Hygiene Officer a written opinion that includes:

- Any recommendations for further medical follow-up
- Results of the medical examination and any associated tests
- Any medical conditions that may be revealed in the course of the examination that may place the employee at increased risk as a result of the exposure to a hazardous chemical found in the workplace
- A statement by the physician that the employee has been informed of the consultation and examination results and any medical condition that may require further examination or treatment

The physician will not reveal any findings unrelated to the exposure.

TRAINING AND INFORMATION
Employees will be provided with information and training to ensure that they understand the hazards of chemicals present in their work area and know how to control or avoid such hazards. The information and training will be provided at the time of an employee's initial assignment to a work area where hazardous chemicals are present and before assignments involving new exposure situations.

Information

The following information will be provided to laboratory employees:

- The contents of the Occupational Exposure to Hazardous Chemicals in Laboratories regulation
- The location and availability of this Plan
- The PELs for regulated substances or recommended exposure limits for other hazardous chemicals where there is no applicable PEL
- Signs and symptoms associated with exposures to hazardous chemicals used in the laboratory
- The location and availability of known reference material on the hazards, safe handling, storage, and disposal of hazardous chemicals found in the laboratory, including SDSs received from the chemical supplier

Training

Training on the following topics will be provided to laboratory employees through a combination of computer, classroom, and/or hands-on instruction:

- Methods and observations used to detect the presence or release of a hazardous chemical, such as monitoring conducted by the employer, continuous monitoring devices, and the visual appearance or odor of hazardous chemicals when being released
- The physical and health hazards of chemicals in the work area
- The measures employees can take to protect themselves from these hazards, including the appropriate work practices, emergency procedures, and PPE needed to protect themselves from exposure to hazardous chemicals
- The applicable details of the Plan

Refresher training

Refresher information and training will be provided to employees whenever laboratory processes or chemicals change or whenever an employee demonstrates lack of knowledge or proficiency in carrying out the requirements of this Plan.

Recordkeeping

The EHS Office, the Employee and Student Health Services, and the Chemical Hygiene Officer will maintain all of the following records as appropriate:

- Chemical inventories
- SDSs
- Hazardous waste inventories
- Waste disposal manifests and records
- Accurate records for each employee who undergoes environmental exposure monitoring, medical consultations, and examinations, including all tests and the written opinions of physicians
- Employee and supervisor training records
- Exposure monitoring records that are not related to specific employees

- Records of safe work practices, safety protocols, and prior approvals related to particularly hazardous chemicals

REFERENCE

MEHARRY WEB SITE:
HTTPS://HOME.MMC.EDU/EHS/

Appendices

A-Chemical Hazard Analysis Worksheet
B-Work with Particularly Hazardous Chemicals
C-Training Record