

Chemical Hygiene Plan

Table of Contents:

iii	Introduction
iv	Implementation and Responsibilities
v	Scope of Application
v	Administrative Details
vii	Required Components of a Chemical Hygiene Plan
viii	Generalized Standard Operating Procedures
viii	Control Measures to Reduce Employee Exposures
x	Fume Hood Performance
x	Employee Information and Training
xii	Activities Requiring Prior Approval
xii	Medical Consultation/Examinations
xiii	Work with Particularly Hazardous Substances
xv	Appendix 1: 29 CFR 1910.1450 Occupational Exposure to Hazardous Chemicals in Laboratories
xv	Appendix 2: OSHA Permissible Exposure Limits (PEL's)
xvii	Appendix 3: Chemical Storage Information
xvii	Appendix 4: Glove Selection
xviii	Appendix 5: Laboratory Safety Checklist
xviii	Appendix 6: Accident Reporting

Introduction

Florida Gulf Coast University (FGCU) is obligated and determined to ensure a safe working environment for all its employees and students engaged in laboratory activities. Both the FGCU Research Safety Committee and the Environmental Health and Safety Department exist on campus to promote and facilitate safe working environments by requiring that research projects meet federal, state and local safety regulations.

For FGCU employees engaged in the laboratory use of hazardous chemicals, the University requires compliance with the provisions of Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.1450 entitled Occupational Exposure to Hazardous Chemicals in Laboratories (OSHA Lab Standard). The principal requirement of this standard is for employers to develop and implement a written Chemical Hygiene Plan (CHP).

With the great diversity of FGCU laboratory activities, it is impossible for any one document to define standard operating procedures (SOPs) for every activity in every laboratory. However, the performance-oriented nature of the OSHA Lab Standard makes it possible to construct a general framework for use by individual laboratories in meeting the requirements of the OSHA Lab Standard.

This document is a template for an FGCU Chemical Hygiene Plan. Its purpose is to provide a framework for the creation of laboratory specific Chemical Hygiene Plans. It provides general information applicable to most laboratories, and identifies the specific information and procedures where each PI must add her or his individual laboratory standard operating procedures to compete the CHP.

[Back to the top](#)

Implementation and Responsibilities

Each Principle Investigator (PI) at FGCU shall implement and administer a Chemical Hygiene Plan for each laboratory activity. The PI for a laboratory activity is laboratory's Chemical Hygiene Officer (CHO). The Chemical Hygiene Officer is responsible for developing, implementing, and reviewing the written Chemical Hygiene Plan including annual reviews and updates as needed.

Although ultimate responsibility for the development and implementation of the chemical hygiene plan for the University rests with the Chemical Hygiene Officer, it is important to realize that the responsibility for chemical hygiene itself rests at all levels of the University. Below are the chemical hygiene responsibilities under the FGCU Chemical Hygiene Plan.

The President of the University, as the chief executive of the University, has ultimate responsibility for chemical hygiene within the institution and with other administrators, as well as providing continuing support for the Chemical Hygiene Plan.

Vice-presidents, Deans, Department Heads, and Principal Investigators are responsible for compliance with the FGCU Chemical Hygiene Plan within their areas. This includes, ensuring that all employees under their direct supervision are complying with the Chemical Hygiene Plan.

Each Chemical Hygiene Officer is responsible for developing, coordinating implementation, and updating their Chemical Hygiene Plan on behalf of the University President, or his designated representative. The Chemical Hygiene Officer must also institute appropriate audit methods to ensure compliance.

Department Chairmen and Chairwomen are responsible for ensuring Principle Investigators and Laboratory Managers develop and implement standard operating procedures and training programs specific to their laboratories.

Laboratory employees are ultimately responsible for developing and applying good chemical hygiene practices as outlined in the Chemical Hygiene Plan. They must always use the appropriate personal protective equipment provided for their use. Laboratory workers are required to report all accidents, injuries, and illnesses to their supervisor to investigate the circumstances of the incident. A report of the investigation and corrective action(s) taken shall be sent to EH&S. (See Appendix 8, Accident Reporting.)

Inform **guests**, including **visiting scientists**, of chemical hygiene practices in the Chemical Hygiene Plan, and of the appropriate personal protective equipment that is available for their use. Other information should include accident, injury, and illness reporting requirements.

[Back to the top](#)

Definitions

In order to determine to whom the FGCU Chemical Hygiene Plan applies, it is first necessary to provide some critical definitions. The definitions listed below are taken directly from the OSHA Lab Standard (29 CFR 1910.1450(b)). Appendix 1 of this Chemical Hygiene Plan is The OSHA Lab Standard, and it provides all definitions relevant to the OSHA Lab Standard (including the following).

Chemical Hygiene Plan means a written program developed and implemented by an employer which sets forth procedures, equipment, personal protective equipment and work practices that are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workplace.

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 hazardous chemicals in the workplace.

Employee means an individual employed or volunteering in a laboratory workplace who may be exposed to hazardous chemicals in the course of his or her assignments.

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 occur in exposed employees. The term "health hazard" includes chemical carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic systems, and agents which damage the lungs, skin, eyes, or mucous membranes.

Laboratory means a facility or activity where the "laboratory use of hazardous chemicals" occurs. It is a workplace using relatively small quantities of hazardous chemicals on a non-production basis.

Laboratory scale means work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person. "Laboratory scale" excludes those workplaces whose function is to produce commercial quantities of materials.

Laboratory-type hood means a device located in a laboratory, enclosed on five sides with a movable sash or fixed partial enclosure on the remaining side; constructed and maintained to draw air from the laboratory and to prevent or minimize the escape of air contaminants into the laboratory; and allows chemical manipulations to be conducted in the enclosure without the insertion of any portion of the employee's body other than hands and arms.

Walk-in hoods with adjustable sashes meet the above definition provided that the sashes are adjusted during use so that the airflow and the exhaust of air contaminants are not compromised and employees do not work inside the enclosure during the release of airborne hazardous chemicals.

Laboratory use of hazardous chemicals means handling or use of such chemicals meeting all of the following conditions:

- ☐ Chemical manipulations are carried out on a "laboratory scale;"
- ☐ Multiple chemical procedures or chemicals are used;
- ☐ The procedures involved are not part of a production process, nor in any way simulate a production process; and
- ☐ "Protective laboratory practices and equipment" are available and in common use to minimize the potential for employee exposure to hazardous chemicals.

Particularly hazardous substances include [select carcinogens](#), reproductive toxins and substances which have a high degree of acute toxicity.

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, or pyrophoric, reactive (unstable), or water reactive.

Protective laboratory practices and equipment means those laboratory procedures, practices and equipment accepted by laboratory health and safety experts as effective, or that the employer can show to be effective, in minimizing the potential for employee exposure to hazardous chemicals.

Based on the definitions above, the FGCU Chemical Hygiene Plan will apply to all areas or laboratories engaged in the laboratory use of hazardous chemicals.

[Back to the top](#)

Administrative Details

The template for the FGCU Chemical Hygiene Plan is available on the Environmental Health & Safety website. This location allows the most current information to be available for all FGCU employees. It will also provide a template for new investigators or Lab Managers when they bring new laboratories on-line and need to complete their own portions of the Chemical Hygiene Plan.

All laboratories should comply with the FGCU [General Laboratory Health and Safety Manual](#).

Laboratories using radioactive materials are also required to follow the policies and procedures outlined in the FGCU Radiation Safety Manual; it can be found at <http://www.fgcu.edu/orsp/Compliance/RadiationManual.doc> or by contacting the EH&S Radiation Safety Officer at (239) 590-1414.

Laboratories where work involving human/primate tissues, recombinant DNA, select agents, or toxins is conducted must also comply with CDC and NIH guidelines. Contact EH&S for details at (239) 590-1414 or find them at <http://www.cdc.gov/od/ohs/biosfty/bmbl4/bmbl4toc.htm>.

[Back to the top](#)

Required Components of a Chemical Hygiene Plan

The OSHA Lab Standard specifies that eight elements be addressed in order to ensure the protection of laboratory employees. These eight elements are summarized below, and are fully detailed in 29 CFR 1910.1450(e)(3) of the regulation.

1. Standard operating procedures for handling toxic chemicals.
2. Criteria to determine and implement control measures to reduce employee exposure to hazardous chemicals.
3. Requirement that chemical fume hoods and other protective equipment are functioning properly and specific measures that shall be taken to ensure proper and adequate performance of such equipment.
4. Employee information and training (including emergency procedures).
5. Requirements for prior approval of laboratory activities.
6. Medical consultation and medical examinations.
7. Designation of personnel responsible for implementation of the Chemical Hygiene Plan including the assignment of a Chemical Hygiene Officer.
8. Provisions for additional employee protection for work with particularly hazardous substances.

Responsibilities under the Chemical Hygiene Plan (#7) are found earlier in this document, and in the [General Laboratory Health and Safety Manual](#). Requirements for prior approval of laboratory activities (#5) are found in the FGCU [General Laboratory Health and Safety Manual](#) and the [ORSP webpages](#). The remaining elements will be addressed in the pages that follow.

[Back to the top](#)

Guide for Preparing Laboratory Specific Standard Operation Procedures

Replace or supplement this guide with standard operating procedures (SOPs) for work involving the laboratory use of hazardous chemicals. See the definition of "Hazardous chemical" in the CHP section entitled [Definitions](#). **An SOP must cover each hazardous chemical used in the laboratory.** In most cases, more than one SOP will be required to describe all of the work in a laboratory.

There are three methods that can be used to write SOPs. They are:

- ☞ By process: (distillation, synthesis, chromatography, etc.).
- ☞ By individual hazardous chemical: (arsenic, benzene, hydrochloric acid, etc.).
- ☞ By hazardous chemical class: (flammable, corrosive, oxidizer, etc.).

The SOP consists of nine sections and should contain the information listed below.

Section 1. Is the SOP for a Process, Hazardous Chemical, or Hazard Class.

- ☞ Process - Describe the process that involves hazardous chemicals. List all chemicals used in the process.
- ☞ Hazardous Chemical - Name the hazardous chemical for which the SOP is being developed. Include IUPAC (International Union of Pure and Applied Chemistry) common name, and any abbreviation(s) used for the chemical.
- ☞ Hazard Class - Describe the hazard associated with a particular group of similar chemicals and list the chemicals used in the laboratory.

Section 2. Describe Process, Hazardous Chemical, or Hazard Class.

Section 3. Potential Hazards - Describe the potential hazards for each process, hazardous chemical or hazard class. Include physical and health hazards.

Section 4. Personal Protective Equipment - Identify the required level of personal protective equipment and hygiene practices needed for each process, hazardous chemical or hazard class.

Personnel protective equipment may include: gloves, aprons, lab coats, safety glasses, goggles, face-shields, and respirators. Before using respirators, all employees must be entered into the University's Respiratory Protection Program. Call EH&S at 590-1414 for more information.

Section 5. Engineering Controls - Describe engineering controls that will be used to prevent or reduce employee exposure to hazardous chemicals for the process, hazardous chemical or hazard class. This includes ventilation devices such as fume hoods, containment devices such as glove boxes, etc.

Section 6. Special Handling & Storage Requirements - List storage requirements for the hazardous chemicals involved with the SOP, including specific storage areas, and policies regarding access to chemicals. Special procedures such as dating peroxide formers and testing them before distillation are appropriate here.

Section 7. Spill and Accident Procedures - Indicate how spills or accidental releases will be handled and by whom. List the location of appropriate emergency equipment (spill kits, showers, eye washes, and fire equipment). Any special requirements for personnel exposure should also be identified in this section. Identify the location of emergency response phone numbers.

Section 8. Decontamination Procedures - Specify decontamination procedures to be used for equipment, glassware, and clothing. Include decontamination procedures for equipment such as glove boxes, hoods, lab benches, and controlled areas within the laboratory.

Section 9. Waste Disposal Procedures - Indicate how wastes will be disposed.

Section 10. Material Safety Data Sheet Location - Indicate the location of MSDSs for each hazardous chemical used. Also, indicate the location of other pertinent safety information, i.e. equipment manuals, chemical references, etc.

STANDARD OPERATING PROCEDURE

Date: _____

Location: _____ Principal Investigator: _____

Section 1: Process, Hazardous Chemical, or Hazard Class

Section 2: Describe Process, Hazardous Chemical, or Hazard Class.

Section 3: Potential Hazards

Section 4: Personal Protective Equipment

Section 5: Engineering Controls

Section 6: Special Handling and Storage Requirements

Section 7: Spill and Accident Procedures

Section 8: Decontamination Procedures

Section 9: Waste Disposal Procedures

Section 10: Material Safety Data Sheet Locations

[Back to the top](#)

Control Measures to Reduce Employee Exposures

Safe work with hazardous chemicals can only be accomplished through the use of proper control measures. Proper control measures include the use of engineering controls, personal protective equipment, proper storage and handling of chemicals, and proper use and maintenance of safety equipment. Use of proper control measures reduces the risk of employee exposure to hazardous chemicals.

It is prudent to minimize all chemical exposures. Because few laboratory chemicals are without hazards, general precautions for handling all laboratory chemicals should be adopted, rather than specific guidelines for particular chemicals. Skin contact with chemicals should be avoided as a cardinal rule.

It is important to avoid underestimation of risk. Even for substances of no known significant hazard the exposure should be minimized; for work with substances which present special hazards, special precautions should be taken. One should assume that any mixture will be more toxic than its most toxic component and that all substances of unknown toxicity are toxic.

Engineering Controls:

Ventilation is a common and important form of engineering control used to reduce exposures to hazardous chemicals. There are two types of ventilation: general ventilation and local exhaust.

General Ventilation:

General ventilation for laboratory operations should be designed such that the laboratory is under a slightly negative pressure relative to other parts of the building. This helps to prevent chemical contamination as well as odors from leaving the lab. Lab ventilation should be 6 to 8 room air changes per hour, verified by professional engineering analysis at the time of installation. It should be noted that this rate will not necessarily prevent the accumulation of chemical vapors in "dead spots" or "eddies," which should be minimized during the design of the laboratory.

Local Exhaust:

Local exhaust ventilation, like that provided by a chemical fume hood, is the recommended method for reducing employee exposures to hazardous dusts, fumes and vapors. In addition to providing protection against chemical exposures, with the hood sash closed or lowered to an appropriate working level the hood can provide some protection from chemical splashes and fires. The maximum working level of the hood sash is identified by the EH&S sticker that contains the maximum working height, hood face velocity, date of inspection and the inspectors' initials.

Chemical fume hood operation is checked annually by EH&S. See FUME HOOD PERFORMANCE below for more information.

Other Ventilation:

Other means of ventilation include the use of biological safety cabinets, evacuated glove boxes, and isolation rooms. These are usually very specialized pieces of equipment, and must be certified for use annually by individuals with proper training and credentials to perform the inspection, i.e. the manufacturer or the distributor. The exhaust from these types of equipment may require passage through special filters or scrubbers before being exhausted to the atmosphere or recirculated to the area.

Personal Protective Equipment:

Standard laboratory attire must be worn when working with hazardous chemicals. Standard laboratory attire includes; lab coat, safety glasses/goggles, gloves, and closed-toed shoes. Additional protective equipment such as face shields, long pants, blast shields, or respirators may be appropriate in some cases. Respirators may only be worn when engineering controls cannot keep exposure to chemicals below permissible exposure levels (PELs) set by OSHA. (See Appendix 2 of this CHP.) **Employees may not wear a respirator until they have been cleared by a physician, attended FGCU Respiratory Protection Training, and been fit tested for the respirator they will be using.**

Proper Storage and Handling of Chemicals:

Proper storage of chemicals is important to prevent chemical reactions that may result in fires, explosions or other safety/health hazards. Chemicals must not be stored in simple alphabetical order. Storage in this manner is unsafe as no regard for chemical incompatibility is considered. Chemicals must be stored according to chemical compatibility, that is, store chemicals of similar hazards and reactive potential together. Suggested chemical storage patterns and lists of chemical incompatibilities are included in Appendix 4 of this plan. Additionally, many chemical companies provide storage codes for their products in order to provide for safe storage.

Flammable Chemical Storage:

When the volume of flammable liquids stored in a laboratory exceeds 10 gallons of flammable or combustible liquids, those liquids must be stored in an approved flammable storage cabinet. Volumes below 10 gallons should be stored based on other compatibility considerations. No more than 60 gallons of flammable liquids, nor more than 120 gallons of combustible liquids may be stored in a flammable storage cabinet. If flammable chemicals are to be stored in a refrigerator, the refrigerator must be approved for flammable storage, i.e. no lights, switches, thermostats inside and marked/labeled appropriately.

Corrosive Liquid Storage:

Corrosive liquid storage should be designed based on the compatibility of both construction materials and other chemicals. Containers should be unbreakable or double contained packaging. Cabinets should be designed to hold the contents in case of container breakage.

Toxic Chemical Storage:






Toxic chemicals should be stored in accordance with general chemical compatibility guidelines. In the case of some poisons, they should be stored in a dedicated locked cabinet.

Storage of Chemicals in Refrigerators:

All refrigerators located in laboratory areas must be clearly marked as to their contents. An inventory list should be posted on the outside of the refrigerator. Refrigerators used for chemical storage must be marked Caution—Do Not Store Food or Beverages in This Refrigerator. Refrigerators located in break rooms or lunchrooms and which are located in the vicinity of laboratories should be marked Food Storage Only, No Chemicals.

Safety Equipment:

At a minimum, the following safety items must be readily available in the laboratory.

-  Fire Extinguisher
-  Eyewash/Safety Shower
-  Spill Kits/Absorbents
-  First Aid Kit
-  Telephone with emergency numbers posted

Fire Extinguishers and eyewash/safety showers are inspected annually by EH&S personnel. Laboratory personnel should check all safety equipment at least once a month to verify operation and accessibility. Report any problems with laboratory safety equipment to EH&S at 590-1414. Restrict laboratory operations until safety equipment is repaired, no chemical work is to be performed in a malfunctioning fume hood.

Spill Kits and First Aid Kits are to be maintained by individual laboratories or departments. Spill Kits must be available for the specific hazards of the chemicals in use in the laboratory. For example; clay absorbent or activated carbon for flammable solvents, bicarbonate of soda for acids, and citric acid for bases. Amorphous silica spill absorbents may be used for all types of spills, except hydrofluoric acid spills. Neutralize hydrofluoric acid with sodium bicarbonate, or absorb it with clay absorbent. Solid materials may be placed directly into the appropriate container (based on volume of spill and chemical nature). All materials collected during spill cleanup must be placed in an appropriate container and properly labeled. If the material is identified as waste it must be disposed of properly by calling EH&S.

[Back to the top](#)

Fume Hood Performance

Yearly Certifications.

EHS verifies chemical fume hood performance annually. Each properly functioning hood will be marked with maximum sash height that provides adequate face velocity across the hood opening. Biological Safety Cabinets and other specialty ventilation devices must be certified by appropriately trained and competent external vendors. Consult EHS for more information.

Inspections by Users

Users should verify hood operation each time they use the hood. Users must ensure that fume hoods are working before each use by using either the low airflow alarm or a magnehelic gauge as supplied to detect hood malfunctions. Do not use a hood if the inspection label is missing or out-of-date (more than 1 year since last inspection). If there are problems with the operation of any hood EH&S should be notified. Typical hoods are not designed to withstand explosions. When using a fume hood, always keep your work at least 6 inches inside the hood face. This simple step can reduce vapor concentrations at the face of the hood by as much as 90 percent.

Contingency Plan for Hood Failures

For a variety of reasons fume hoods may malfunction. To avoid interruptions in laboratory use, users must have a contingency plan for hood failure.

If a fume hood malfunctions close the sash and report it to EHS. If a hazardous condition exists in a malfunctioning fume hood it must be contained and removed before the hood will be repaired. Place a warning sign on the hood to prevent others from opening or using the hood until it is repaired and EHS has verified the unit is working properly.

[Back to the top](#)

Employee Information and Training

An essential component of the FGCU Chemical Hygiene Plan is providing information and training to all laboratory workers. This information and training will ensure that laboratory workers are aware of the hazards posed by chemicals in their work areas and how to protect themselves from these hazards. Training will occur at the time of initial assignment and prior to work involving new exposure situations. Refresher training will occur annually, or as necessary based on observation by the laboratory PI.

Employee Information and Training

Laboratory worker training will include:

- the contents and appendices of the FGCU CHP
- mandatory and recommended exposure limits for hazardous chemicals
- the signs and symptoms associated with exposures to hazardous chemicals

[Back to the top](#)

Activities Requiring Prior Approval

In order to protect the health and safety of laboratory employees, building occupants, and the community at large, certain laboratory activities require prior approval before they may begin, or the materials procured. See the [General Laboratory Health and Safety Manual](#) for details.

[Back to the top](#)

Medical Consultation/Examinations

Whenever an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory, the employee shall be provided an opportunity to receive an appropriate medical examination. When exposure monitoring reveals an exposure level routinely above the action level (or in the absence of an action level, the PEL) for an OSHA regulated substance for which there are exposure monitoring and medical surveillance requirements, medical surveillance shall be established for the affected employee. Whenever an event takes place in the work area such as a spill, leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure, the affected employee shall be provided an opportunity for a medical consultation. Such consultation shall be for the purpose of determining the need for a medical examination.

Notify FGCU EHS of all cases of possible overexposure to hazardous chemicals. EH&S will then conduct an exposure assessment and collect all relevant information regarding the situation. All incidents of overexposure must be fully documented. See Appendix 7, Accident Reporting.

All consultations/examinations will be conducted or supervised by a licensed physician. These consultations and/or examinations will be provided by the employer to the employee at no cost.

In cases where laboratory employees seek medical attention for possible overexposure to hazardous chemicals, in addition to a copy of the chemical MSDS(s) the Principal Investigator must provide the following information for the attending physician.

- ☞ The identity of the hazardous chemical(s) to which the employee may have been exposed;
- ☞ A description of the conditions under which the exposure occurred including quantitative exposure data, if available; and
- ☞ A description of the signs and symptoms of exposure that the employee is experiencing, if any.

For any consultation/examination provided under this program, the person responsible for the employee must ensure that the attending physician provides a written opinion regarding the case including the following information to FGCU EHS.

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

The written opinion must not reveal specific findings or diagnoses that are unrelated to the occupational exposure.

[Back to the top](#)

Work with Particularly Hazardous Substances

Additional protective measures must be implemented in areas where particularly hazardous substances are used.

Working with Allergens and Embryotoxins

Allergens (examples: diazomethane, isocyanates, bichromates): Wear suitable PPE (gloves, lab coats, safety glasses, respirators, etc.) to prevent hand contact with allergens or substances of unknown allergenic activity.

Embryotoxins (examples: organomercurials, lead compounds, formamide): If you are a woman of childbearing age, handle these substances only in a glove box or properly functioning hood. Use appropriate protective apparel (gloves, lab coats, etc.) to prevent skin contact.

Work with Chemicals of Moderate Chronic or High Acute Toxicity

For substances with moderate chronic or high acute toxicity used in significant quantities, use and store these substances only in areas of restricted access with special warning signs. Always use a hood (previously evaluated to confirm adequate performance with a face velocity of at least 60 linear feet per minute) or other containment device for procedures which may result in the

generation of aerosols or vapors containing the substance; trap released vapors to prevent their discharge with the hood exhaust. Always avoid skin contact by use of gloves and long sleeves (and other protective apparel as appropriate) , and always wash hands and arms immediately after working with these materials.

Maintain records of the amounts of these materials on hand, amounts used, and the names of the workers involved. Assure that at least 2 people are present at all times if a compound in use is highly toxic or of unknown toxicity.

Work with Chemicals of High Chronic Toxicity

In addition to the procedures and requirements mentioned above, for work with substances of known high chronic toxicity (in quantities above a few milligrams to a few grams, depending on the substance) include the following procedures.

Conduct all transfers and work with these substances in a "controlled area": a restricted access hood, glove box, or portion of a lab, designated for use of highly toxic substances, for which all people with access are aware of the substances being used and necessary precautions.

Protect vacuum pumps against contamination by scrubbers or HEPA filters and vent them into the hood. Decontaminate vacuum pumps or other contaminated equipment, including glassware, in the hood before removing them from the controlled area. Use chemical decontamination whenever possible; ensure that containers of contaminated waste (including washings from contaminated flasks) are transferred from the controlled area in a secondary container under the supervision of authorized personnel.

Decontaminate the controlled area before normal work is resumed there. On leaving a controlled area, remove any protective apparel (placing it in an appropriate, labeled container) and thoroughly wash hands, forearms, face, and neck. Use a wet mop or a vacuum cleaner equipped with a HEPA filter instead of dry sweeping if the toxic substance is a dry powder.

If using toxicologically significant quantities of such a substance on a regular basis (e.g., 3 times per week), consult EHS concerning desirability of regular medical surveillance.

Keep accurate records of the amounts of these substances stored and used, the dates of use, and names of users.

Assure that the controlled area is conspicuously marked with warning and restricted access signs and that all containers of these substances are appropriately labeled with identity and warning labels.

Assure that contingency plans, equipment, and materials to minimize exposures of people and property in case of accident are available.

Animal Work with Chemicals of High Chronic Toxicity

For large scale studies, special facilities with restricted access are preferable.

When possible, administer the substance by injection or gavage instead of in the diet. If administration is in the diet, use a caging system under negative pressure or under laminar air flow directed toward HEPA filters. Devise procedures which minimize formation and dispersal of contaminated aerosols, including those from food, urine, and feces (e.g., use HEPA filtered vacuum equipment for cleaning, moisten contaminated bedding before removal from the cage, mix diets in closed containers in a hood).

When working in the animal room, wear plastic or rubber gloves, fully buttoned laboratory coat or jumpsuit and, if needed because of incomplete suppression of aerosols, other apparel and equipment (shoe and head coverings, respirator).

Consult with EHS prior to the initiation of the project to prepare for disposal of contaminated animal tissues and excreta.

[Back to the top](#)

Appendix 1: 29 CFR 1910.1450 Occupational Exposures to Hazardous Chemicals in Laboratories

[Back to the top](#)

Appendix 2: OSHA Permissible Exposure Limits (PEL's)

Contact Environmental Health and Safety for guidance on ACGIH TLV's, and other exposure limits which may be more up to date and appropriate for laboratory use.

[Back to the top](#)

Appendix 3: Chemical Storage Information

[Back to the top](#)

Appendix 4: Glove Selection

[Back to the top](#)

Appendix 5: Laboratory Safety Checklist

Please see the [Self-Assessment form](#). This checklist may be used to determine if your laboratory meets basic safety practices as outlined in the FGCU General Laboratory Health and Safety Manual.

[Back to the top](#)

Appendix 6: Accident Reporting

Employees who identify a hazard in the workplace should inform their supervisor. Their supervisor then has the primary responsibility for investigating the hazard with input from his or her Dean, Director, Chair, and other staff. All employee injuries require the completion of a hazard investigation in addition to the report to Workers' Compensation. Damaged equipment or other workplace property may warrant a hazard investigation at the supervisor's discretion. Call Environmental Health & Safety at (239) 590-1414 if you have any questions about workplace hazard investigation. Procedures for reporting incidents and forms are at http://www.fgcu.edu/EHS/Files/Workplace_Hazard_Investigation_Report_Form_revised.pdf.

[Back to the top](#)
