Tarrant County Public Health Department
1101 South Main Street
Fort Worth, Texas 76104

Tarrant County Public Health Department

North Texas Regional Laboratory

Chemical Hygiene Plan

(Includes Guidelines for Working with Toxins of Biological Origin)

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CHEMICAL HYGIENE PLAN
(Includes Guidelines for Working with Toxins of Biological Origin)

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CHEMICAL HYGIENE PLAN

(Includes Guidelines for Working with Toxins of Biological Origin)

I. GENERAL

The purpose of this Chemical Hygiene Plan is to define work practices and procedures to help ensure that laboratory workers are protected from health hazards associated with the hazardous chemicals and toxins with which they work. The Chemical Hygiene Plan is part of the laboratory's compliance with the Occupational Safety and Health Administration's (OSHA) regulation entitled "Occupational Exposures to Hazardous Chemicals in Laboratories" (Code of Federal Regulations, 29 CFR 1910.1450).

OSHA has defined a hazardous chemical, as "a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principals that acute or chronic health effects may occur in exposed employees". In addition, OSHA defines a laboratory as "a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis." Finally, laboratory workers are defined in the OSHA Lab Standard under the definition of "employee" as "an individual employed in a laboratory workplace that may be exposed to hazardous chemicals in the course of his/her assignments." An example of a laboratory worker would be a chemist, microbiologist, medical technologist or laboratory technician.

A. The Chemical Hygiene Plan shall be examined by laboratory workers prior to the commencement of lab duties at the Tarrant County Public Health Department laboratory.

B. When applicable to a laboratory position, a written, initialed record will be kept in the front of the Chemical Hygiene Plan manual stating that each laboratory worker has reviewed the Chemical Hygiene Plan and related health and safety policies and guidelines.

C. This Chemical Hygiene Plan (referred to as the Plan throughout this document) will be reviewed annually by the Laboratory Manager.

D. The OSHA Lab Standard (29 CFR 1910.1450) ensures that employees are protected from chemical hazards. Employees and supervisors each have responsibilities to conform to this standard.

E. Lab Supervisors must:
   1. Provide chemical safety information and training. Training must be done prior to initial assignment, annually, when new hazardous chemicals and toxins are added to inventory, and whenever new exposure situations arise. Documentation is required. Training must include:

a. An overview of the OSHA Lab Standard "Occupational Exposures to Hazardous Chemicals in Laboratories" 29 CFR Part 1910.1450.
b. The lab's Chemical Hygiene Plan.
c. A review of applicable Safety Data Sheets (SDSs) to include detection methods and observations of a release of the chemical, and physical and health hazards associated with the chemical.
d. The work practices, emergency procedures and personal protective equipment to be used for protection against overexposure.

2. Implement and enforce health and safety rules for their work area. This includes ensuring that all employees are complying with the Chemical Hygiene Plan.
3. Enforce the use and availability of appropriate personal protective equipment.

F. All laboratory employees (supervisors and lab personnel) are responsible for the following:
1. Knowing the hazards associated with the chemical and ensuring they are stored and disposed of properly.

II. CHEMICAL HYGIENE PLAN COMPONENTS

A. A laboratory that utilizes hazardous chemicals and toxins[1] must implement a Chemical Hygiene Plan. This requirement is based on the Federal Occupational Safety and Health Administration's "Occupational Exposures to Hazardous Chemicals in Laboratories" standard. A Chemical Hygiene Plan is implemented in this laboratory of the Tarrant County Public Health Department, Fort Worth, Texas. It includes the following:
1. Standard operating procedures;
2. Criteria to determine and implement specific control measures such as engineering controls and personal protective equipment;
3. A requirement that ventilation hoods and other engineering controls be functioning properly;
4. Information and training requirements;
5. A description of the circumstances under which a particular laboratory operation will require prior approval from the employer;
6. Provisions for medical consultation and medical exams;
7. Designation of a chemical hygiene officer; and
8. Provisions for additional protection for work with select carcinogens, reproductive toxins, and substances with a high degree of active toxicity, including the establishment of a designated area, the use of containment devices, procedures for safe removal of wastes, and decontamination procedures.

[1] *A hazardous chemical as defined by OSHA is "a chemical for which there is a statistically significant evidence based on at least one study conducted in accordance with established scientific principals that acute or chronic health effects may occur in exposed employees."*

III. RESPONSIBILITIES

A. Specific to this Chemical Hygiene Plan, the Laboratory Safety Officer (or designee) responsibilities include the following:

1. Review the Chemical Hygiene Plan annually and suggest modifications as needed.
2. Provide technical assistance to laboratory supervisors and workers concerning appropriate storage, handling and disposal of hazardous chemicals and toxins.
3. Provide general laboratory safety training upon request.
4. Assist employees in medical consultation as needed.
5. Provide technical assistance concerning personal protective equipment and laboratory safety equipment.
6. Maintain a library of manufacturer's Safety Data Sheets and other laboratory and chemical safety literature.
7. Remain current on rules and regulations concerning chemicals and toxins used in the laboratory.
8. Conduct drills or exercises annually to evaluate the effectiveness of the plan.

B. The Laboratory Manager and Supervisors have the primary responsibility for the health and safety of their staff. Specific responsibilities regarding the implementation of the Chemical Hygiene Plan include:

1. Collaborate with staff to tailor a Chemical Hygiene Plan to include lab-specific guidelines and to develop strategies to implement the Plan.

C. Laboratory supervisors have the following responsibilities for implementing the Chemical Hygiene Plan:

1. Inform and train employees concerning chemical safety as required by this Plan.
2. Implement and enforce rules and standards concerning health and safety for laboratories under supervisor's jurisdiction.
3. Ensure compliance of laboratory workers with this Plan.
4. Ensure the availability and enforce the use of appropriate personal protective equipment.
5. Remain cognizant of chemicals and toxins stored and used in the lab and their associated hazards.
6. Request assistance from the Laboratory Safety Officer (or designee) as needed.
7. Request allocation of funds from superiors for health and safety improvements as needed.

D. Employee responsibilities regarding implementation of the Chemical Hygiene Plan:

1. Follow all health and safety standards and rules.
2. Report all hazardous conditions to the supervisor.
3. Wear or use prescribed protective equipment.

4. Report any job-related injuries or illnesses to the supervisor and seek treatment immediately.
5. Refrain from the operation of any equipment or instrumentation without proper instruction and authorization.
6. Remain aware of the hazards of the chemicals and toxins in the lab and how to handle hazardous chemicals and toxins safety.
7. Request information and training when unsure how to handle a hazardous chemical or procedure.

IV. STANDARD OPERATING PROCEDURES

"Standard operating procedures relevant to safety and health considerations to be followed when laboratory work involves the use of hazardous chemicals." 29 CFR 1910.1450(e)(3)(i)

The Plan represents a minimum set of guidelines for the handling of toxic chemicals and toxins in the laboratory. Acceptable lab safety references of this document may be adopted in whole or may be useful in developing additional procedures. In all situations, supervisors will be responsible for enforcing adequate safety and hygiene measures in the laboratory. If necessary, additional assistance from the Laboratory Safety Officer (or designee) is available.

A. Respect and understand the safety and health hazards associated with the chemicals and toxins and equipment in the laboratory, and practice the following general safety guidelines at ALL times:
   1. Leaving hazardous systems unattended is not good practice.
   2. When working with hazardous materials, it is advisable to have a second person present, or at a minimum, maintain surveillance via telephone contact.
   3. Exits, aisles and safety equipment must NOT be obstructed in any way with equipment, furniture, etc. Work areas and floors are not to be used for excessive storage.
   4. In work areas where there is a reasonable likelihood of exposure to potentially infectious materials/toxins, employees are not to eat, drink, apply cosmetics or lip balm, smoke, or handle contact lenses. Food and beverages are not to be kept in refrigerators, freezers, shelves, cabinets, or on counter tops or bench tops where blood or other potentially infectious materials/toxins are present.
   5. Employees must wash their hands immediately (or as soon as feasible) after removal of gloves or other personal protective equipment.
   6. Horseplay is prohibited.
   7. Use proper equipment that is in good condition. Never use chipped or cracked glassware. Shield pressurized or vacuum apparatus and safeguard against bumping or overheating.
   8. Disposal of all laboratory waste shall follow the procedures outlined in the chemical waste section.
   9. All spills of chemicals will be promptly cleaned up using a chemical spill kit which may be found in each room of the laboratory. Employees will promptly

report spillage of chemicals and/or toxins to the Chemical Hygiene Officer. Employees will wear appropriate protection, as designated by the Chemical Hygiene Officer. For large spills/leaks call 9-911 to activate the Hazardous Materials Unit of the City of Fort Worth Fire Department.

10. Mouth pipetting/suctioning of chemicals or toxins is prohibited.
11. When inserting tubing into stoppers, lubricate tubing and protect hands from being cut in the event of the tubing slipping and breaking.

B. Personal protection and personal hygiene are two very basic aspects of laboratory safety. Wearing appropriate personal protection and practicing good personal hygiene as described below will minimize exposures to hazardous chemicals and toxins during routine use and in the event of an accident.

1. Wear laboratory coat, with long cuffed sleeves, and gloves, covering cuff of sleeves, when handling chemical or toxins. Coats are worn at all times in the designated laboratory areas and are not to be worn outside these areas. Disposable lab coats or gowns are recommended. No sandals or open-toed shoes are allowed.
2. Gloves are essential when working with hazardous substances. The proper gloves will prevent skin absorption, infection, or burns. All glove materials are not equally effective in protection from chemical hazards. Consult the Laboratory Safety Officer (or designee) for assistance in appropriate glove selection. Gloves must be removed before leaving the laboratory. When handling dry forms of toxins that are electrostatic, do not wear gloves (such as latex) that help generate static electricity.
3. It is laboratory policy that employees and visitors in laboratories wear safety glasses, goggles, or face shields at all times where eye hazards are a possibility. Goggles are recommended when chemical splashes are possible.
4. Face shields that cover the neck and ear areas should be worn when conducting a procedure that may result in a violent reaction.

C. Hazards associated with various chemicals and gases vary widely. Understanding the hazards associated with a compound and minimizing the quantity used and stored in the lab will decrease the chance of injury.

1. Chemical storage.
    a. Chemicals ideally should be stored by compatibility, not by alphabetical arrangement. Oxidizers should be separated from organics, air/water reactives must be kept dry and cyanides should be stored away from acids.
    b. Volatile toxic substances shall be stored in volatile storage cabinets adequate to the purpose or in hoods when storage cabinets are unavailable. If volatile substances are stored in a hood, other uses of the hood shall be restricted to activities compatible with the chemical and physical properties of the stored or used chemicals. When volatiles must be stored in a cooled atmosphere, explosion-proof refrigerators or cold rooms designed for this purpose are recommended.

2. Chemical handling.
    a. Use bottle carriers for transporting chemicals that are in glass containers.
    b. Close caps securely and avoid storing chemical containers in hard to reach areas.
    c. Pour chemicals carefully, and never add water to concentrated acid.
    d. Metal containers and nonconductive containers (e.g., glass or plastic) holding more than five gallons must be grounded when transferring flammable liquids.
3. Chemical waste.
    a. **Note: Consult the Safety Data Sheet (SDS) for each specific chemical to determine how chemicals are to be properly and safely disposed of according to state and federal guidelines.**
    b. If allowable, liquid chemical waste may be disposed of in the chemical sinks specifically designed for chemical waste located within the laboratory. When using chemical sinks for disposal, always flush with copious amounts of water. There are two of these sinks located in the glassware cleaning room (labeled as chemical disposal sinks) and also inside each chemical fume hood.
    c. Other extremely hazardous liquid chemical waste may only be disposed of by treatment at a permitted facility or as advised by the local hazardous waste regulatory authority. Certain chemicals requiring pretreatment steps are documented in the Standard Operating Procedures (SOPs).
    d. All hazardous solid chemical waste is to be stored inside approved chemical transport containers. Once the container is full, the appropriate disposal company will be notified.
4. Cylinder storage.
    a. Cylinders must be stored in well-ventilated areas with their protective caps screwed on and the cylinder secured (e.g., strapped or chained down) to reduce the chance of the cylinder being knocked over.
    b. Do not store cylinders near heat or highly trafficked areas.
    c. Do not store flammables and oxidizers together.
    d. Do not store empty and full cylinders together.
    e. Storage of large quantities of cylinders must be done in an approved gas cylinder storage area.
5. Cylinder handling.
    a. Use appropriate handcarts to move cylinders. Cylinders must be secured to the cart during transport.
    b. Highly toxic gases should not be moved through the corridors, particularly during business hours.
    c. Always consider cylinders to be full and handle them with corresponding care.
6. Labels.
    a. Make sure all labels are legible.
    b. Label all secondary containers with the chemical name and appropriate hazards.

c. Labels on incoming containers of hazardous chemicals are not removed or defaced.

7. Containers.
   a. Check the integrity of containers.
   b. Observe compatibilities, for example, hydrofluoric acid must not be stored in glass and some oxidizers should not be stored in plastic containers.

V. CONTROLLING CHEMICAL EXPOSURES

"Criteria that the employer will use to determine and implement control measures to reduce employee exposure to hazardous chemicals including engineering controls, the use of personal protective equipment and hygiene practices; particular attention shall be given to the selection of control measures for chemicals that are known to be extremely hazardous." 29 CFR 1910.1450(e)(ii)

There are three major routes of entry for a chemical or toxin to enter the body: inhalation, skin and eye contact and ingestion. Three types of controls for prevention of these various routes of entry include: engineering controls, personal protective equipment and administrative controls. Each route of entry a chemical or toxin can take to enter the body can be controlled by a number of varying controls as explained below:

A. Inhalation hazards

1. Inhalation of chemicals or toxins is the most common route of entry a chemical or toxin can take to enter the body. To avoid significant inhalation exposure, engineering controls such as substituting a less volatile or a less toxic chemical or substituting a liquid or solid chemical for a gaseous one is the best means of control. If substitution is not practical, ventilation should be used to lessen the change of overexposure. The use of well-functioning local exhaust ventilation such as ventilation hoods, biological safety cabinets, vented glove boxes and other local exhaust systems is often required to minimize exposure to hazardous chemicals or toxins. Dilution ventilation may be used to reduce exposure to non-hazardous nuisance odors.
2. If both substitution and engineering controls are unavailable, the use of personal protective equipment may be required to reduce inhalation exposures. Respiratory protection from N-95 masks to self-contained breathing apparatus may be utilized to this end. If laboratory employees wear respirators, requirements of the OSHA Respirator Standard (1910.139) are implemented. This Standard requires training in the proper use of respirators, medical surveillance to ensure the user is capable of wearing a respirator, and fit testing to ensure that the respirator fits properly. A lab worker or his/her supervisor should contact the Laboratory Safety Officer in the event that respiratory protection is utilized to control exposures to hazardous chemicals and toxins. See the Powered Air Purifying Respirator (PAPR) System Procedure in the BT Laboratory Operations Procedures/Policies Manual.

3. Finally, administrative controls can be utilized to reduce the risk of overexposure to hazardous chemicals and toxins. Some examples of administrative controls include:
   a. Minimization of exposure time for individual employees;
   b. Restricted access to an area where a hazardous chemical is used;
   c. Allowing a process that emanates nuisance odors to be done only after typical office hours, when most of the staff in the building have gone home.

B. Skin/eye contact hazards

1. To reduce the risk of a chemical entering the body via skin and eye contact, engineering controls include substitution and appropriate ventilation as described above in Inhalation hazards. The more obvious means of preventing skin and eye contact is the wearing of personal protective equipment such as eye protection, face shields, gloves, appropriate shoes, lab aprons, lab coats, and other protective equipment as appropriate to the hazard. Since the chemical resistance of the different types of protective equipment varies significantly, the employee should consult the Laboratory Safety Officer (or designee) to ascertain that the protective equipment material is resistant to the chemical or toxin being protected against.
2. Administrative controls to reduce skin/eye contact include:
   a. Enforcement of policies pertaining to skin and eye protection;
   b. Discarding or repair of cracked or broken glassware.

C. Ingestion

1. Ingestion of chemicals or toxins is the least common route of entry into the body. However, a laboratory worker can easily ingest chemicals into the body via contaminated hands if they are not washed prior to eating, smoking, or sticking part of the hand or a writing tool that has been in contaminated hands into the mouth.
2. Some controls for preventing this route of exposure include engineering controls, such as isolating the hazardous substance so minimal contact is required (e.g., use glove box), personal protective equipment such as the wearing of gloves, and administrative controls such as restricting mouth pipetting, encouraging good personal hygiene and designating a well-marked, non-chemical area where eating, drinking and the application of cosmetics is permitted.

Contact the Laboratory Safety Officer (or designee) for any suspected overexposure to substances in the workplace.

VI. CHEMICAL FUME HOODS AND OTHER ENGINEERING CONTROLS

"A requirement that 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".
29 CFR 1910.1450(e)(3)(iii)

A. Laboratory Chemical Fume Hoods

The chemical fume hood is the primary laboratory ventilation control system for protecting laboratory personnel from exposure to hazardous chemicals. The hood itself is one component of a system that consists of a working chamber, an exhaust system, proper hood location, make-up air to the hood, a hood monitoring system, hood operating parameter, routine performance surveys, and system maintenance.

B. Ventilation Hood Air Flow

Air flow patterns are affected by many factors, including traffic patterns, room make-up air, doorways, room size, hood location, work practices, objects inside the hood, baffle adjustment, and sash opening. These are considerations for design, installation and use of ventilation hoods. Ideally, the air should flow into the lab from the doors, hallways and the room air supply and exit the room through the ventilation hood. There should not be any turbulence at the hood face that could spill contaminated air into the room. All areas of the open hood face should have a velocity sufficient to draw room air and not spill contaminated air from the hood.

C. Hood Classification Guidelines

Standards of performance for ventilation hoods are set forth by ANSI/AIHA Z9.5 and OSHA 29 CFR 1910.145(e)(3)(iii). The average face velocity of optimally performing hoods should be between 80 and 120 feet per minute (FPM) when measured with the sash raised to the 18" mark. These average face velocities and the date of survey will appear on the inspection sticker located on the front of the ventilation hood. Ratings are also stated according to the hood performance as follows:

CRITERION	**USAGE**
Average face velocity 80-120 fpm	Normal chemical hood use
Average face velocity 70-79 or 121-150 fpm	Not recommended for use with highly toxic materials
Not meeting the above standards	Storage only

D. Ventilation Hood Work Practices

1. All work involving hazardous chemicals should be performed inside a chemical fume hood.
2. Before work begins, check to be sure the hood fan is turned on.
3. Check the airflow by observing the monitor.
4. Check the inspection sticker to determine if the hood has been currently (annually) inspected. If questions arise about inspection or current hood

performance, contact the Laboratory Safety Officer (or designee) for assistance.

5. Chemical fume hoods should be used with the sash positioned at 18" or lower when possible for optimal performance and as a protective shield.
6. All equipment and materials should be located at least 6" back inside the hood from the sash face.
7. Large items should be elevated at least 2" from the hood base to insure airflow to the baffle opening at the rear interior base of the hood.
8. Do not use the hood as a storage cabinet. Excessive storage can obstruct airflow and cause areas of low air velocity at the face opening.
9. Do not extend face or head inside the hood.
10. Minimize traffic and other sources of cross drafts (i.e. open windows, doors, fans, etc.) that may pull contaminated air from the hood.
11. When using electrical equipment in a hood, take extra precautions to prevent spark sources from causing fire or explosion. All electrical connections should be made outside the hood.
12. If there is a power failure while the hood is in use, the procedure to follow is:
    a. Recap bottles
    b. Lower sash
    c. Leave the area immediately
    d. Place sign on door(s) – signs to post are located inside the chemical hoods
    e. Notify supervisor
13. Emergency plans should be understood by all hood users in the event of an unexpected occurrence such as fire or explosion in the hood.
14. If assistance is needed regarding the safe operation of a hood, contact the Laboratory Safety Officer (or designee).

VII. EMPLOYEE INFORMATION AND TRAINING

"Provisions for employee information and training as prescribed in paragraph (f) of this section." 29 CFR 1910.1450(e)(3)(iv)

All individuals who work in laboratories who may be exposed to hazardous chemicals or toxins must be informed of the hazards of chemicals or toxins present in their work area. This information and training as outlined below must be provided before initial assignment, annually, when new hazardous chemicals or toxins are added to inventory, and whenever new exposure situations arise. Equipment necessary for the safe handling of hazardous substances must also be provided. The Laboratory Safety Officer (or designee) will give training to new lab employees. However, training specific for a particular lab section where an employee is assigned is the responsibility of that employee's supervisor. The supervisor shall determine the frequency of refresher information and training.

A. Laboratory workers shall be informed of the location and availability of the following.
    1. 29 CFR Part 1910.1450 "Occupational Exposures to Hazardous Chemicals in Laboratories" (OSHA Lab Standard).

2. Chemical Hygiene Plan.
3. Reference materials on chemical safety, including Safety Data Sheets (SDS) to find permissible exposure limits (PELs) for OSHA regulated substances, the exposure limits or threshold limit values (TLVs) of a chemical, and signs and symptoms associated with exposure to hazardous chemicals and toxins. (Signs and symptoms of exposure to infectious agents and toxins may be found in the "Infectious Agents Safety Data Sheets" manual located in rooms 1714 and 1716.)

B. Laboratory work training shall include:
1. Detection methods and observations that may be used to detect the presence or release of a hazardous chemical or toxin.
2. Physical and health hazards of the chemicals and toxins.
3. The work practices, personal protective equipment, and emergency procedures to be used to ensure that the employee may protect himself/herself from overexposure to hazardous chemicals or toxins.

C. The manufacturer's Safety Data Sheets will generally contain most of the above information needed to comply with the information and training requirements of the OSHA Lab Standard. Hence, employees should read and understand the relevant MSDSs and/or other comparable literature on the hazardous chemicals and toxins that are used or stored in their laboratory. The employee's supervisor must provide additional training for specific lab hazards.

D. The Lab Chemical Hygiene Plan, a library of SDSs and other health and safety references are maintained in the laboratory and are available upon request. Additionally, a list of safety and industrial hygiene literature may be found on the References page of this Plan.

E. Copies of SDSs may be obtained from the chemical supplier. Each section of the lab maintains a library of SDSs for the chemicals used within their section.

VIII. PRIOR APPROVAL

"The circumstances under which a particular laboratory operation, procedure or activity shall require prior approval from the employer or the employer's designee before implementation". 29 CFR 1910.1450(e)(3)(v)

The responsibility for approval of the acquisition and use of toxic chemical agents rests with the Laboratory Manager. Certain materials including radioactive materials, recombinant DNA and certain biohazards require prior approval. If there are questions concerning the need for approvals, the Laboratory Safety Officer (or designee) should be consulted.

IX. MEDICAL CONSULTATION

"Provisions for medical consultation and medical examinations in accordance with paragraph (g) of this section." 29 CFR 1910.1450(e)(3)(vi)

A. An opportunity to receive medical consultation shall be provided under the following circumstances: if an employee develops any signs or symptoms thought to arise from chemical or toxin overexposure; or after an event such as a major spill, leak or explosion which may have resulted in an overexposure.

B. The procedure for reporting an employee injury, illness, accident, or incident in the laboratory may be found in the Employee Injury Guidelines section in the Tarrant County Public Health Department Risk Management Guidelines manual.

C. Any medical examination required by this Plan shall be provided without cost to the employee, without loss of pay and at a reasonable time and place.

D. Tarrant County Public Health shall provide the following information to the physician:
1. The identity of the hazardous chemical(s) to which the employee may have been exposed.
2. A description of the conditions under which the exposure occurred including quantitative exposure data, if available.
3. A description of the signs and symptoms of exposure that the employee is experiencing, if any.

E. Tarrant County Public Health shall obtain a written opinion from the examining physician which shall include the following:
1. Any recommendation for further medical follow-up.
2. The results of the medical examination and any associated tests.
3. 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.
4. 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.
5. The written opinion shall not reveal specific findings of diagnoses unrelated to occupational exposure.

F. As part of the procedure for training employees, a person knowledgeable in the subject must conduct training for employees as it relates to the specific workplace. The training shall include, among many other things, information on actions the employee should take and whom to contact in case of an emergency or exposure incident.

G. If an employee exhibits certain suspicious symptoms and wants to consult with the Tarrant County Public Health Authority during normal working hours, they may contact Dr. Sandra Colquitt at extension 4816 to discuss any questions or concerns. After hours or in an emergency situation, Dr. Colquitt may be reached at her emergency contact number, 817-205-8402.

X. CHEMICAL HYGIENE OFFICER

"Designation of personnel responsible for implementation of the Chemical Hygiene Plan including the assignment of a Chemical Hygiene Officer and, if appropriate, establishment of a Chemical Hygiene Committee." 29 CFR 1910.1450(e)(3)(vii)

The Laboratory Safety Officer will be designated as the Chemical Hygiene Officer for the Tarrant County Public Health Laboratory.

XI. SPECIAL PROVISIONS FOR SELECT CARCINOGENS, REPRODUCTIVE TOXINS AND ACUTELY TOXIC CHEMICALS

"Provisions for additional employee protection for work with particularly hazardous substances. These include "select carcinogens," reproductive toxins and substances that have a high degree of acute toxicity. Specific consideration shall be given to the following provisions that shall be included where appropriate:

A. Establishment of a designated area;
B. Use of containment devices such as fume hoods or glove boxes;
C. Procedures for safe removal of contaminated waste; and
D. Decontamination procedures."
29 CFR 1910.1450(e)(3)(viii)

In addition to the general safety guidelines mentioned in the Standard Operating Procedures and throughout the Plan, special precautions are needed when handling genotoxins, reproductive toxins and chemicals with a high degree of acute toxicity. A minimum set of guidelines that should be followed is listed below. The lab supervisor should ensure that these and other precautions designed to minimize risk of exposure to these substances are taken.

A. Quantities of these chemicals used and stored in the laboratory should be minimized, as should their concentrations in solution or mixtures.

B. Work with genotoxins, reproductive toxins and acutely toxic chemicals should be performed within a functioning hood, biological safety cabinet, ventilated glove box, sealed system, or other system designed to minimize exposure to these substances. (The exhaust air from the ventilation systems may require scrubbing before being released into the atmosphere.) In all cases, work with these types of chemicals shall be done in such a manner that the OSHA permissible exposure limits or similar standards are not exceeded.

C. Laboratory personnel should periodically evaluate the ventilation efficiency of designated chemical fumes and the operational effectiveness of mechanical and electrical equipment used to contain or manipulate special substances. The supervisor determines the periodic intervals. The interval of evaluating systems may vary from weekly to biannually depending upon the frequency of usage, quantities employed and level of hazard.

D. Each laboratory utilizing these substances must designate an area for this purpose and must sign or mark this area with an appropriate hazard warning. The designated area may be an entire laboratory, an area of the laboratory or a device such as a ventilation hood or glove box. The designated area should be marked with a DANGER, specific agent, AUTHORIZED PERSONNEL ONLY or comparable warning sign.

E. All employees who work in a laboratory which has an area designated for use with genotoxins, reproductive toxins and acutely toxic chemicals must be trained regarding the health hazards of these substances as well as signs and symptoms regarding exposure to these substances, whether or not they actually work with the substance themselves. Training to ensure the safe handling and storage of these substances is required for those who use these materials. This training is the responsibility of the employee's supervisor and must be done prior to the use of any of these materials.

F. Laboratory workers working with these chemicals must have access to appropriate protective equipment and clothing (available at no expense to the workers) and must be trained on how to properly utilize the safety equipment.

G. All wastes contaminated with these substances should be collected and disposed in a timely manner and appropriately. For special disposal information, call the Laboratory Safety Officer. If possible and as soon as practical, waste shall be disposed of by the contracted waste disposal company, or destroyed by a suitable, generally acceptable chemical procedure to lessen or eliminate their toxicity.

H. The designated working area shall be thoroughly and appropriately decontaminated and cleaned at regular intervals determined by the lab's supervisor. The interval may be as short as one day or as long as six months depending upon the frequency of usage and level of hazard.

I. Special precautions to avoid release and exposure to highly toxic chemicals, genotoxins and reproductive toxins must be utilized. For instance, volatile substances should be kept cool and contained; gases should have properly functioning valves, check valves, regulators, appropriate piping and containment that can withstand pressure buildup.

J. Emergency response plans for releases or spills are outlined in the Tarrant County Public Health Department's Incident Response Plan as well as the Safety Plan.

XII. SPECIAL PROVISIONS FOR WORKING WITH TOXINS OF BIOLOGICAL ORIGIN

In addition to the general safety guidelines mentioned in the Standard Operating Procedures and throughout the Plan, special precautions are needed when handling toxins of biological origin. A minimum set of guidelines that should be followed is listed below. The lab supervisor should ensure that these and other precautions designed to minimize risk of exposure to these substances are taken.

A. Training specific to the toxin(s) used is required and documented for all laboratory personnel working with toxins, before starting work with the toxin and at refresher training annually thereafter.
B. An inventory control system is in place.
C. Toxins are stored in a locked freezer or refrigerator when not in use.
D. Access to areas containing toxins is restricted to those whose have prior DOJ approval.
E. Preparation of primary containers of toxin stock solutions and manipulations of primary containers of dry forms of toxins will be conducted in a biological safety cabinet containment system approved by the safety officer. HEPA and/or charcoal filtration of the exhaust air may be required, depending on the toxin.
F. The user will verify inward airflow of the hood or biological safety cabinet before initiating work.
G. All work will be done within the operationally effective zone of the hood or biological safety cabinet.
H. When toxins are in use, the room will be posted to indicate "Toxins in Use - Authorized Personnel Only." Any special entry requirements are posted on the entrance to the room. Only personnel whose presence is required are permitted in the room while toxins are in use.
I. All high risk operations will be conducted with two knowledgeable individuals present. Each must be familiar with the applicable procedures, maintain visual contact with the other, and be ready to assist in the event of an accident.
J. Before containers are removed from the cabinet, the exterior of the closed primary container will be decontaminated and placed in a clean secondary container. Toxins will be transported only in leak/spill-proof secondary containers.
K. Contaminated and potentially contaminated protective clothing and equipment will be decontaminated using methods known to be effective against the toxin before removal from the laboratory for disposal, cleaning or repair. If decontamination is not possible/practical, materials (e.g., used gloves) will be disposed of as toxic waste. Materials contaminated with infectious agents as well as toxins will also be autoclaved or otherwise rendered non-infectious before leaving the laboratory.
L. The interior of the cabinet will be decontaminated periodically. Until decontaminated, the cabinet will be posted to indicate that toxins are in use, and

access to the equipment and apparatus restricted to necessary, authorized personnel.

M. When using an open-fronted biological safety cabinet, protective clothing, including gloves and a disposable long-sleeved gown, will be worn so that hands and arms are completely covered.

N. Eye protection will be worn while working with toxins.

O. Other protective equipment may be required, depending on the characteristics of the toxin and the containment system. Use additional respiratory protection if aerosols may be generated. If both substitution and engineering controls are unavailable, the use of personal protective equipment may be required to reduce inhalation exposures. Respiratory protection from N-95 masks to self-contained breathing apparatus may be utilized to this end. If laboratory employees wear respirators, requirements of the OSHA Respirator Standard (1910.139) are implemented. This Standard requires training in the proper use of respirators, medical surveillance to ensure the user is capable of wearing a respirator, and fit testing to ensure that the respirator fits properly. A lab worker or his/her supervisor should contact the Laboratory Safety Officer in the event that respiratory protection is utilized to control exposures to hazardous chemicals and toxins. See the Powered Air Purifying Respirator (PAPR) System Procedure in the BT Laboratory Operations Procedures/Policies Manual.

P. When handling dry forms of toxins that are electrostatic, do not wear gloves (such as latex) that help to generate static electricity.

Q. When handling toxins that are percutaneous hazards (irritants, necrotic to tissue, or extremely toxic from dermal exposure), double gloves must be worn.

R. Consider both toxin and diluent when selecting gloves and other protective clothing.

S. If infectious agents and toxins are used together, consider both when selecting protective clothing and equipment.

T. If toxins are stored in the laboratory, all containers should be sealed, labeled, and secured to ensure restricted access; refrigerators and other storage containers should be clearly labeled and provide contact information for trained, responsible laboratory staff.

U. All pressurized tubes or other containers holding toxins should be opened in a BSC, chemical fume hood, or other ventilated enclosure.

V. Glassware should be replaced with plastic for handling toxin solutions wherever practical to minimize the risk of cuts or abrasions from contaminated surfaces.

W. Thinwalled glass equipment should be completely avoided. Glass Pasteur pipettes are particularly dangerous for transferring toxin solutions and should be replaced with disposable plastic pipettes.

X. For spills involving toxins of biological origin, the surfaces involved should be cleaned with 0.1% or 0.5% solution of sodium hypochlorite (0.1% = 1 part household bleach to 49 parts of water; 0.5% = 1 part household bleach to 9 parts of water). No guidelines for contact time are available so post-cleaning surface sampling is recommended to check on effectiveness.

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XIV. APPENDIX 1

OSHA Lab Standard

Please see http://www.cehs.siu.edu/Chemical/CHP/Appendix%204.htm for more information concerning the OSHA Lab Standard.