STANFORD UNIVERSITY
LABORATORY CHEMICAL SAFETY PLAN
ENVIRONMENTAL HEALTH & SAFETY

This Safety Plan is specific to the Laboratory indicated below and is supplemental to the institutional requirements outlined in Stanford University's Chemical Hygiene Plan ***http://ChemHygienePlan.stanford.edu.***

Principal Investigator:	
Phone:	
Email:	
Department:	
Building:	
Room(s):	

Contents:

Key Elements of Chemical Hygiene Plan

1. Responsibilities
   - Principal Investigator
   - Laboratory Personnel
2. Laboratory Self Inspections
3. Training Requirements
4. Prior Approvals and Special Precautions
5. Creating Standard Operating Procedures (SOP)

Additional guidance can be found in the Laboratory Chemical Safety Toolkit ***http://chemtoolkit.stanford.edu***

Records *(Either insert records in binder or indicate location in lab where located.)*

1. Training Records:_____
2. Standard Operating Procedures: _____
3. Lab Self Inspection Records: _____

References and Resources

1. Emergency Actions for Hazardous Material Incidents: **Located in Life Safety Box**
2. Emergency Contact List: **Located in Life Safety Box**
3. Laboratory Chemical Waste Guidelines
4. Biohazardous and Medical Waste Disposal Guidelines
5. Lab Compliance Cheat Sheet
6. Stanford Storage Group Classification System
7. Stickers available from Stanford EH&S
8. Other Lab-specific information

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Principal Investigator - Understanding Your Responsibilities

Summary: Per Stanford University's Chemical Hygiene Plan, the PI/Laboratory Supervisor has responsibility for the health and safety of laboratory personnel doing work in his/her laboratory. For each of the responsibilities described below, there is a corresponding page in the Chemical Safety Toolkit (**http://chemtoolkit.stanford.edu**) to guide you in fulfilling the responsibility. The PI/Laboratory Supervisor may delegate the safety duties for which he/she is responsible, but must make sure that any delegated safety duties are carried out**.**

1. Identify hazardous conditions or operations in the lab, determine safe procedures and controls, and implement and enforce standard safety procedures.
2. Establish standard safety operating procedures (general and protocol-specific).
3. Provide prior-approval for the use of Restricted Chemicals in the PI/Laboratory Supervisor's laboratory.
4. Consult on higher risk chemical usage and operations so that special safety precautions may be taken.
5. Maintain the on-line laboratory chemical inventory for the laboratory.
6. Provide laboratory personnel access to the Chemical Hygiene Plan, any individual Laboratory Safety Plan, and chemical hazard information.
7. Train laboratory personnel under your supervision to work safely with hazardous chemicals and operations and maintain records of training provided locally.
8. Maintain in functional working order appropriate work place engineering controls (e.g., fume hoods) and safety equipment (e.g., emergency showers/eyewashes, fire extinguishers), with emphasis on controls for particularly hazardous substances.
9. Maintain in functional working order appropriate personal protective equipment (e.g., gloves, goggles).
10. Conduct periodic laboratory inspections and maintaining records of inspections.
11. Promptly report laboratory accidents and injuries to Risk Management and Environmental Health & Safety (EH&S).
12. Make available required medical surveillance or medical consultation/ examination for laboratory personnel.
13. Inform facilities personnel, other non-laboratory personnel and any outside contractors of potential lab-related hazards when they are required to work in the laboratory environment. Identified potential hazards should be minimized to provide a safe environment for repairs and renovations.

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Laboratory Personnel - Understanding Your Responsibilities

Summary: Per Stanford University's **Chemical Hygiene Plan**, laboratory personnel who work with hazardous chemicals in research laboratories have the responsibilities listed below. Consult with your PI/Laboratory Supervisor as you implement your responsibilities. For each responsibility, there is a corresponding page in the toolkit (**http://chemtoolkit.stanford.edu**) to provide guidance.

1. Follow the Chemical Hygiene Plan and any individual Laboratory Safety Plan.
2. Follow oral and written laboratory safety rules, regulations, and standard operating procedures required for the tasks assigned.
3. Keep work areas safe and uncluttered.
4. Review and understand chemical hazards and hazards of laboratory procedures prior to conducting work.
5. Utilize appropriate measures to control identified hazards, including consistent and proper use of engineering controls, personal protective equipment, and administrative controls.
6. Understand the capabilities and limitations of personal protective equipment issued.
7. Gain prior approval from the PI/Lab Supervisor for the use of Restricted Chemicals.
8. Consult with PI/Laboratory Supervisor prior to higher risk chemical usage and operations so that special safety precautions may be taken.
9. Promptly report accidents and unsafe conditions to PI/Laboratory Supervisor.
10. Complete all required health and safety training.
11. Participate in the medical surveillance program, when required.
12. Inform PI/Laboratory Supervisor of any work modification ordered by physician as a result of medical surveillance or occupational injury or exposure.

In addition to the above responsibilities, laboratory personnel working autonomously or performing independent research are also responsible for:

- Providing the PI/Laboratory Supervisor with a written scope of work for their proposed research.
- Notifying and consulting with the PI/Laboratory Supervisor, in advance, if they intend to deviate from their written scope or scale of work.
- Preparing SOPs and performing literature searches relevant to safety and health that are appropriate for their work.
- Providing appropriate oversight, training and safety information to laboratory personnel they supervise or direct.

Laboratory Inspections

Summary: To identify and address potential safety and health deficiencies and for regulatory compliance purposes, laboratories must be inspected as follows. Current version of inspection forms available at http://chemtoolkit.stanford.edu.

What to do and where?	When?
General Laboratory Inspection For all laboratories	At least quarterly (more frequently where determined appropriate by PI/Laboratory Supervisor). Retain records of inspection and any follow-up for at least 3 years.
Hazardous Materials Storage Area Inspection For rooms designated as hazardous materials storage areas (including shared/ common work areas and designated storage rooms)	At least monthly. Retain records of inspection and any follow-up for at least 3 years.
Waste Accumulation Area Inspection For specially designated waste accumulation areas. Contact EH&S Chemical Waste Program at x5-7520 for more information.	At least weekly. Retain records of inspection and any follow-up for at least 3 years.
Controlled Substance Laboratory Inspection For laboratories where controlled substances are used and/or stored (applicable to those labs enrolled under the institutional program).	At least quarterly. Retain records of inspection and any follow-up for at least 1 year.
Exempt Quantities CDC Select Agent Toxin Checklist For laboratories where CDC select agents will used/ stored	At least quarterly. Retain records of inspection and any follow-up for at least 1 year.
Shop Area Inspection For all locations, including labs, with shop machinery and tools	At least quarterly (more frequently where determined appropriate by PI/Laboratory Supervisor). Retain records of inspection and any follow-up for at least 3 years.

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Safety Training and Hazard Information

Summary: To apprise laboratory personnel of the hazards of chemicals present in their work area, information and training must be made available. Laboratory personnel must receive general and laboratory-specific information and training at the time of initial assignment to the laboratory, and prior to assignments involving new exposure situations, Particularly Hazardous Substances, and hazardous operations.

What to do?	How to do this?
Obtain General Laboratory Safety Training	Take the following training. ◦ General Safety & Emergency Preparedness (EHS-4200)* ◦ Chemical Safety for Laboratories (EHS-1900)* ***AND**, where applicable:* ◦ Compressed Gas (EHS-2200)* ◦ Radiation Safety Training for work with radioactive materials, x-ray sources, and laser sources. Contact Health Physics at 723-3201 for more information. ◦ Computer Workstation Ergonomics (EHS-3400)* ◦ Laboratory Ergonomics (call EH&S at 723-0448) * Available on-line, register in STARS at http://axess.stanford.edu/
Obtain Laboratory-specific training	1. See your PI/Laboratory Supervisor. 2. Review any individual Laboratory Safety Plan. 3. Review local/building safety information by completing the *Lab-Specific Training Checklist*[2] or equivalent. 4. Review Standard Operation Procedure(s) involving hazardous materials. You may use form, *Documenting SOP & Prior Approval*[1] to document your review. Review any other laboratory-specific training on particular safety procedures or hazard encountered in the laboratory environment. Lab-owned equipment may require specialized training to ensure safety and prevent equipment damage.
Maintain Training Records	PI/Laboratory Supervisor or designate must retain training documents for laboratory personnel at least one year. Use *Safety Training Documentation Form*[1] or equivalent to document training.

[2] Current versions of these forms available at http://chemtoolkit.stanford.edu

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Prior Approval and Special Precautions

Summary: Prior approval is the process whereby laboratory personnel seek permission and the PI/Lab Supervisor grants approval for the use of Restricted Chemicals. These include

- Toxic gases regulated by Santa Clara County
- Dimethylmercury

Laboratory personnel should consult with PI/Laboratory Supervisors on all work involving highly toxic chemicals, carcinogens, reproductive toxins, highly reactive materials and other activities posing special risks in their laboratories so that special safety precautions can be taken, where appropriate.

What to do?	How
For use of Restricted Chemicals, obtain prior approval before you execute the operation	1. Complete the form *Documenting SOP Review and PI Approval* available at http://chemtoolkit.stanford.edu*;* OR 2. PI/Laboratory Supervisor signs and dates laboratory personnel's laboratory notebook and indicates approval for the process, procedure or activity; OR 3. PI/Laboratory Supervisor provides other written approval (e.g., via e-mail or memo). 4. Retain record of prior approval for at least one year.
Consult with PI/Lab Supervisor on higher risk chemical usage and operations	Consult can include, but is not limited to discussion regarding special hazards, safety precautions, and review of applicable standard operating procedures.

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Creating Standard Operating Procedures

Summary: A standard operating procedure (SOP) is a set of written instructions that describes in detail how to perform a laboratory process or experiment safely and effectively. SOPs are a requirement of Stanford University's Chemical Hygiene Plan **http://chemhygieneplan.stanford.edu**, as described in section 4.0.

The scope of an SOP can cover:

- The specific use of a chemical or class of chemicals (such as a specific laboratory procedure).
- The generic use of specific chemical or class of chemicals with similar hazards (for example, mineral acids).
- A generic procedure (such as distillation) that covers several chemicals.

Responsibility

The PI/Lab Supervisor is responsible for providing written Standard Operating Procedures (SOPs) relevant to health and safety for laboratory activities he/she directs involving hazardous chemicals. Laboratory personnel working autonomously or performing independent research are responsible for developing SOPs appropriate for their own work using the guidance below.

Prioritizing SOP Development

Priority for SOP development should be given to any operation involving Restricted Chemicals, certain higher risk chemicals, such as particularly hazardous chemicals and highly reactive chemicals, and specified higher risk research procedures described in the CHP.

What to do?	How to do this?
1. Prioritize SOPs to generate.	Consult with PI/Laboratory Supervisor on above guidance.
2. Create SOPs.	Use **SU's SOP Template** or equivalent. If using SU SOP Template: 1. Complete Sections 1 -10. a. The grey text provides guidance on how to complete the section. Guidance text may be deleted. b. Some sections indicate blanks to complete. c. Section #7, Emergency Procedures, provides the established Stanford University procedures to follow, with specific contact information to be added.

Creating Standard Operating Procedures continued

	2. After completion, review the SOP with your Principal Investigator/Lab Supervisor. [NOTE: At any time, you are welcome to consult with EH&S (723-0448) during the development of your SOP.] <u>General Use SOPs</u> General use SOPs for the major classes of hazardous chemicals are available for you to incorporate into your own SOPs, as appropriate. • Carcinogens • Compressed Gases • Corrosive Materials • Cyrogenic Liquids • Flammable & Combustible Liquids • Highly Acutely Toxic Materials • Highly Reactive/Unstable Materials • Irritants • Reproductive Toxins • Sensitizers • Restricted Chemicals • Nanomaterials
3. Maintain SOPs.	Maintain copy that is physically or electronically accessible to all lab members.
4. Revise SOPs.	Consult with PI/Laboratory Supervisor on SOP on timeframe for re-evaluating and revising SOP to ensure it reflects current best practices.