

Laboratory Safety for Researchers

Learning Activity Details

Description:

The purpose of this course is to provide you with the framework for safety in your laboratory work and resources for help in complying with the legal requirements.

This course contains 3 sections:

Section 1: General Laboratory Safety

Section 2: UCSF Safety Programs

Section 3: Managing Hazardous Chemicals

Training frequency: only taken once

Next

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Outline Thumbnails Notes Search

1: Welcome

00:31

Welcome

Welcome to the Laboratory Safety for Researchers training program. This course is required for all new employees, faculty, students, volunteers, and visitors who work in laboratories with hazardous materials. Before you begin working in the lab, you must complete training for the specific procedures and hazards of your laboratory. This course gives you information on UCSF's practices and the safety resources available to you.

Laboratory Safety for Researchers

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Click the Forward arrow  to continue.



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Course Navigation

Outline Thumbnails Notes Search

2. Course Navigation

00:24

Course Navigation

This course has no narration.

Click the Notes tab to see the notes for that page of the course.

The Tab bar contains the Attachments tab, where there are documents related to the course, and other tabs with special information. Throughout the course, you will receive instructions to click the Attachments tab or one of the other tabs.

Lab Safety For Researchers (00:08 / 00:21)

CHEMICAL STORAGE SPELLS AIDS ATTACHMENTS



Outline Notes Search

Welcome

00:21

Welcome

Welcome to the Laboratory Safety for Researchers training program. This course is required for all new employees, faculty, students, volunteers, and visitors who work in laboratories with hazardous materials. Before you begin working in the lab, you must complete training for the specific procedures and hazards of your laboratory. This course gives you information on UCSF's practices and the safety resources available to you.

ATTACHMENTS

Click the items below to view the attached content:

- [Universal Hazardous Materials Use Form](#)
- [Hazard Report](#)
- [Chemical Safety Manual](#)
- [Radiation Safety Manual](#)
- [Biological Safety Manual](#)

Attachments

The **Tab** bar contains the **Attachments** tab, where there are documents related to the course, and other tabs with special information.

Throughout the course, you will receive instructions to click the **Attachments** tab or one of the other tabs.

Click the Forward arrow to continue

Forward

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Outline Thumbnails Notes Search

3. Introduction: Course Overview

00:05

Introduction
 Federal, state and local regulations, and UCSF policy require all persons working in research labs or those working in proximity to hazardous materials take a basic course in laboratory safety and hazard awareness.
 The purpose of this course is to provide you with the framework for safety in your laboratory work and resources for help in complying with the legal requirements.
 You can leave the course at any time. When you return, you will be taken to where you left off.
 Knowledge checks at the end of each section check your understanding of the information in that section.
 You must

Introduction: Course Overview

The purpose of this course is to provide you with the framework for safety in your laboratory work and resources for help in complying with the legal requirements.

You can leave the course at any time. When you return, you will be taken to where you left off.

Knowledge checks at the end of each section check your understanding of the information in that section.

You must pass the final test to receive credit.



Section 1: General Laboratory Safety

- » Injury and Illness Prevention Plan (IIPP)
- » Hazard Communication
- » Emergency preparedness

Section 2: Specific Safety Programs

- » Radiation safety
- » Controlled substances
- » Biological safety

Section 3: Managing Hazardous Chemicals

- » Chemical safety
- » Fume hood safety
- » Hazardous waste management

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Outline Thumbnails Notes Search

4: Course Objectives

00:23

Course Objectives
 At the end of this course, you will be able to

- Describe the practices for general laboratory safety
- Discuss the safety programs at UCSF, specifically
- Explain how to manage hazardous chemicals

Course Objectives

When you have completed this course, you will be able to

- Describe the practices for general laboratory safety
- Discuss the safety programs at UCSF
- Explain how to manage hazardous chemicals



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Regulatory Overview

Outline Thumbnails Notes Search

5. Regulatory Overview

00:48

Introduction
 Before you begin your work, it is important that you understand the legal framework for safety in your laboratory. The laws, regulations, and regulating agencies are shown in this chart.

Before you begin your work, it is important that you understand the legal framework for safety in your laboratory.

The laws, regulations, and regulating agencies are shown in this chart..

Law/Regulation	Agency	What it regulates
The Laboratory Safety Standard: Title 8, §5191	CAL-OSHA	Laboratory work
The Hazard Communication Standard: Title 8, §5194	CAL-OSHA	Occupational exposure to hazardous materials
California Code of Regulations Title 8, §3203	CAL-OSHA	The Illness and Injury Prevention Program
The Resource Conservation and Recovery Act	The US Environmental Protection Agency	Hazardous waste: classification, transportation, storage, disposal
The Toxic Substances Control Act: California Code of Regulations Title 22	California Department of Toxic Substances Control	Hazardous waste: classification, transportation, storage, disposal
San Francisco: Hazardous Materials Unified Program	San Francisco Department of Public Health (HMUPA)	Hazardous materials storage; hazardous waste generation; hazardous waste treatment
California Medical Waste Management Act	San Francisco Department of Public Health	Storage, collection, packaging, treatment, and disposal of medical waste



The EH&S Website

Outline Thumbnails Notes Search

6. The EH&S Website

00:14

The EH&S Website

The Environmental Health and Safety website is your primary source of information about environmental health and safety at UCSF.

Take a moment to review the EH&S website. Bookmark the page. Then close it and click the Forward button to continue.

The Environmental Health and Safety website is your primary source of information about laboratory safety at UCSF.

Take a moment to review the OEH&S website. Save it to your computer then close it.

lydlandegarrod@gmail.com

Click the Forward button to continue.





Outline Thumbnails Notes Search

7. Environmental Health and Safety Specialist

00:05

Environmental Health and Safety Specialist

OEH&S has a Health and Safety Specialist Program to assist departments in finding solutions to safety related problems.

An Environmental Health & Safety Specialist has been assigned to work with each department and administrative unit on campus.

The Environmental Health & Safety Specialist will work cooperatively to provide information, training, technical expertise, and interpretation of regulatory requirements regarding health and safety concerns.

Click the link to open the EHS Specialist page. Save it to your computer for future reference then close the page.

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Save it to your computer for future reference then close the page.

Office of Research: Environmental Health and Safety



[Home](#) > [About EHS&S](#) > [Find Your EHS&S Specialist](#)

Find Your Environment, Health and Safety Specialist



An EHS&S specialist is assigned to work with each department and administrative unit on campus. This specialist provides information, training, technical expertise, and interpretation of regulatory requirements. When looking up your Environmental Health and Safety Specialist, please note there are different assignments depending upon your location/campus.

Departments: [A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

Safety is everybody's responsibility!



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Outline Thumbnails Notes Search

8. Section One: General Laboratory Safety

00:15

Section 1: General Laboratory Safety.

This section focuses on the Injury and Illness Prevention Program (IIPP), hazard communication and emergency preparedness, including emergency action plans, earthquake preparedness, fire prevention and response, using fire extinguishers, and electrical safety.

Section One

General Laboratory Safety



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Section 1 Overview

Outline Thumbnails Notes Search

9. Section 1 Overview

00:28

- Objectives**
 When you have completed this section, you should be able to
- Describe UCSF's IIPP Program
 - Describe hazard communication
 - Explain emergency preparedness practices
- Topics**
- UCSF's IIPP Program
 - Hazard communication
 - hazard identification
 - Material Safety Data Sheets
 - exposure prevention
 - exposure routes
 - personal protective equipment
 - engineering controls
 - administrative controls
 - Emergency preparedness
 - Emergency Action Plans
 - showers and eyewashes
 - earthquake preparedness
 - fire prevention and response
 - electrical safety

Objectives

When you have completed this section, you should be able to

- Describe UCSF's IIPP Program
- Discuss hazard communication
- Explain emergency preparedness practices

Topics

- UCSF's IIPP Program
- Hazard communication
 - » hazard identification
 - » Material Safety Data Sheets
 - » exposure prevention
 - personal protective equipment
 - engineering controls
 - administrative controls
- Emergency preparedness
 - » Emergency Action Plans
 - » showers and eyewashes
 - » earthquake preparedness
 - » fire prevention and response
 - » electrical safety

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Outline Thumbnails Notes Search

10: Injury and Illness Prevention Plan (IIPP)

00:30

Introduction

The State of California requires UCSF to have an Injury and Illness Prevention Plan. Cal-OSHA mandates that all California employees must be trained on IIPP.

Click the Attachments tab and select IIPP Program. Save it to your computer then close it. Click the tabs on the left to learn more about the IIPP program.

Tab 1: Compliance with Health and Safety Standards

Principal Investigators and Supervisors are required to inform employees of the provisions contained in the IIPP. Adherence to safe work practices and the proper use of required personal protective equipment will be monitored. Compliance will be evaluated and reinforced by Principal Investigators and

Injury and Illness Prevention Plan (IIPP)

Compliance with Health and Safety Standards

Training

Reporting Safety Issues

On the Job Injuries

Safety Inspections

Injury and Illness Prevention Plan (IIPP)

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Click the Attachments tab and select the document titled IIPP Program. Save it to your computer for future reference then close it.

Click here to bookmark the EH&S IIPP Program page.

Click the tabs on the left to learn more about the IIPP program.



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Outline Thumbnails Notes Search

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Injury and Illness Prevention Plan (IIPP)

Compliance with
Health and Safety
Standards

Training

Reporting Safety
Issues

On the Job Injuries

Safety Inspections

Compliance with Health and Safety Standards

- Principal Investigators and Supervisors are required to inform employees of the provisions contained in the IIPP.
- Adherence to safe work practices and the proper use of required personal protective equipment will be monitored.
- Compliance will be evaluated and reinforced by Principal Investigators and Supervisors.
- Non-compliance with health and safety practices will be addressed through performance evaluation, corrective action and progressive discipline, up to and including dismissal.
- Principal Investigators and Supervisors should consult with their Labor & Employee Relations Analyst if they have questions regarding how to address employee issues.

Click [here](#) to see the **Guide to Developing your Workplace Injury and Illness Prevention Program**.



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Outline Thumbnails Notes Search

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00:30

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Injury and Illness Prevention Plan (IIPP)

Compliance with
Health and Safety
Standards

Training

Reporting Safety
Issues

On the Job Injuries

Safety Inspections

Training

- Supervisor/managers are responsible for training personnel in safe work practices specific to the job.
- OEHS conducts training classes for general health and safety issues on a regular basis.
- The classes meet the regulatory requirements levied by OSHA and the California Department of Health Services.
- They do not replace requirements for supervisors to train or make certain employees are trained in the specific hazards of their workplace.

Click [here](#) to see more information on safety training.



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Outline Thumbnails Notes Search

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Injury and Illness Prevention Plan (IIPP) < > >>

- Compliance with Health and Safety Standards
- Training
- Reporting Safety Issues**
- On the Job Injuries
- Safety Inspections

Reporting Safety Issues

To make a safety suggestion or report a hazardous condition, an employee may complete an "Employee Safety Suggestion/Hazard Report" which you will find on the EH&S website.

Click the **Attachments** tab to see an example of this form. Save it to your computer then click the forward button to continue.



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Outline Thumbnails Notes Search

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Injury and Illness Prevention Plan (IIPP) ◀ ▶ 🔍

- Compliance with Health and Safety Standards
- Training
- Reporting Safety Issues
- On the Job Injuries**
- Safety Inspections

On the Job Injuries

If you are injured on the job, notify your supervisor.

Your supervisor must complete a Supervisor Incident Report.

Click the **Attachments** tab and select the document titled **Supervisor Incident Report**. Save it to your computer for future reference then it file and continue.





Injury and Illness Prevention Plan (IIPP)

Next Slide



Outline Thumbnails Notes Search

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Compliance with Health and Safety Standards

Training

Reporting Safety Issues

On the Job Injuries

Safety Inspections

Safety Inspections

OEHS conducts annual safety inspections for all UCSF facilities and follows up on safety concerns.

OEHS maintains all records for both health and safety training and inspections.

OEHS and Disability Management Services conduct investigations of all reported accidents and occupational injuries/illnesses.

Click [here](#) to see more information on safety inspections.



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Outline Thumbnails Notes Search

11. General Safety

00:45

Introduction: Exposure Prevention/Hazard Awareness

Prevention of exposure to hazardous chemicals is an integral element of your health and safety. The Hazard Communication Program requires that you

- be familiar with the hazards of all chemicals in your work area
- know the specific hazards of materials or procedures you use in the laboratory
- complete all required training
- be prepared for accidents that may result in exposures to biological, chemical, or radiation hazards

Also, hazardous substance containers must be appropriately labeled, addressing the hazards related to its contents.

General Safety

Hazard Identification

Material Safety Data Sheets

Exposure Prevention: PPE

Exposure Prevention: Engineering controls

Exposure Prevention: Administrative Contr...

Campus Emergencies

SFGH

Biological Exposure

Exposure Prevention / Hazard Awareness

Prevention of exposure to hazardous substances is an integral element of your health and safety. The Hazard Communication Program requires that you

- be familiar with the hazards of all chemicals in your work area.
- know the specific hazards of materials or procedures you use in the laboratory
- complete all required training
- be prepared for accidents that may result in exposures to biological, chemical, or radiation hazards.



Hazardous substance containers must be appropriately labeled, addressing the hazards related to its contents.

For more information, click the **Attachments** tab and select **Hazard Communication**.

For a checklist on assessing workplace hazards, select **Hazard Assessment Checklist**.

Save the documents to your computer for future reference.



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Outline Thumbnails Notes Search

11. General Safety

00:45

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General Safety

Hazard Identification

Material Safety Data Sheets

Exposure Prevention: PPE

Exposure Prevention: Engineering controls

Exposure Prevention: Administrative Contr...

Campus Emergencies

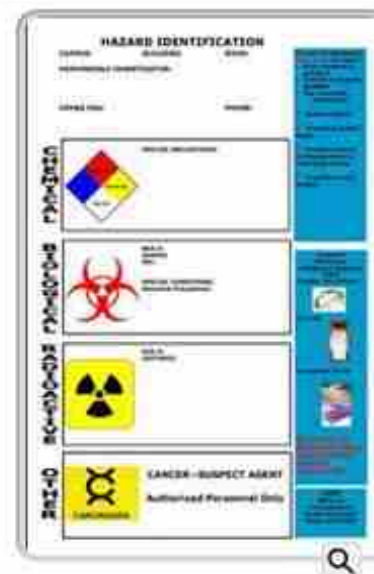
SFGH

Biological Exposure

Hazard Identification

A hazard identification sign must be posted at the entrances to all laboratories. It contains the following information:

- Location of laboratory
- Name of principal investigator
- EH&S specialist contact information
- Types of hazardous materials in the laboratory
- Use authorizations numbers
- Personal protective equipment (PPE) required



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Outline Thumbnails Notes Search

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General Safety

Hazard Identification

Material Safety Data Sheets

Exposure Prevention: PPE

Exposure Prevention: Engineering controls

Exposure Prevention: Administrative Contr...

Campus Emergencies

SFGH

Biological Exposure

Material Safety Data Sheets

Your PI and/or lab supervisor must provide training on hazardous materials and safety procedures specific to your laboratory including using material safety data sheets (MSDS).

Material Safety Data Sheets are available at the OEHS website.

We will discuss Materials Safety Data Sheets later in this course.





Outline Thumbnails Notes Search

11. General Safety

00:45

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General Safety

- Hazard Identification
- Material Safety Data Sheets
- Exposure Prevention: PPE
- Exposure Prevention: Engineering controls
- Exposure Prevention: Administrative Contr...
- Campus Emergencies
- SFGH
- Biological Exposure

Exposure Prevention: PPE

Using the correct personal protective equipment (PPE) is essential to your health and safety.

- **Always** wear a lab coat to minimize contact with hazardous materials
- Wear closed-toed footwear such as sneakers or leather shoes at all times.
- Gloves provide protection against certain chemicals. Manufacturer websites provide glove selection charts.
- goggles with side guards
- face shield or safety glasses



Click the Attachments tab and select **Glove Selection Guide**.



General Safety

Outline Thumbnails Notes Search

11. General Safety

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Hazard Identification

Material Safety Data Sheets

Exposure Prevention: PPE

Exposure Prevention: Engineering controls

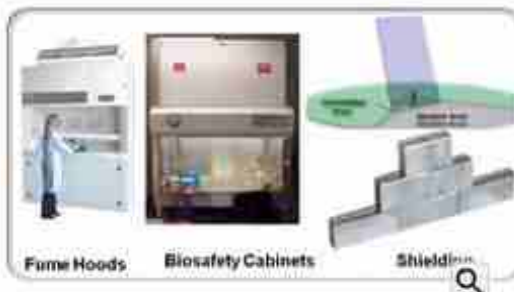
Exposure Prevention: Administrative Contr...

Campus Emergencies

SFGH

Biological Exposure

Exposure Prevention: Engineering controls



Engineering controls are the first line of defense for exposure reduction. Some key examples of engineering controls are:

- Fume hoods protect researchers from inhaling volatile chemicals.
- Biosafety cabinets protect personnel and the environment against biological hazards.
- Proper shielding prevents exposure to radiation.



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Outline Thumbnails Notes Search

11. General Safety

00:45

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General Safety

Hazard Identification

Material Safety Data Sheets

Exposure Prevention: PPE

Exposure Prevention: Engineering controls

Exposure Prevention: Administrative Contr...

Campus Emergencies

SFGH

Biological Exposure

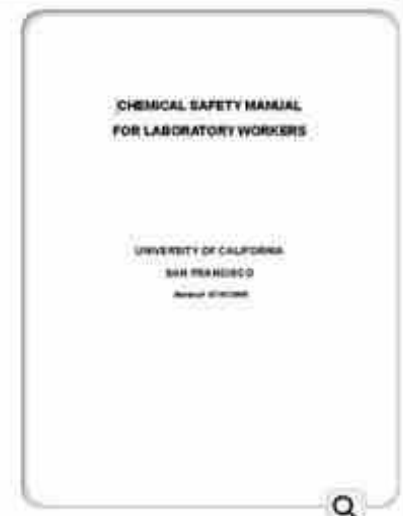
Exposure Prevention: Administrative Controls

Safety procedures

- Protocols
- Directions

Safety manuals provide information on specific programs.

- Chemical Safety Manual
- Radiation Safety Manual
- Biological Safety Manual
- Controlled Substances Manual



To view and save these manuals to your computer, click the Attachments tab and select them from the list.



General Safety

Hazard Identification

Material Safety Data Sheets

Exposure Prevention: PPE

Exposure Prevention: Engineering controls

Exposure Prevention: Administrative Contr...

Campus Emergencies

SFGH

Biological Exposure

Campus Emergencies

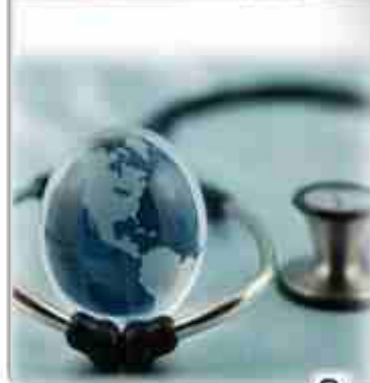
For all on-campus emergencies dial 9-911.

For immediate medical attention, go to the nearest emergency room.

For all non emergency injuries contact:

- the principal investigator and/or your supervisor
- Occupational Health Services

Notify your EH&S specialist of any incidents or exposures in the laboratory.



Outline Thumbnails Notes Search

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Outline Thumbnails Notes Search

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General Safety

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Campus Emergencies

SFGH

Biological Exposure

SFGH

For hazardous materials spills, call 415.206.8522

Needlestick and biological exposures: 415.469.4411

All other Emergencies: 911



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General Safety

Next Slide

Outline Thumbnails Notes Search

11. General Safety

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Hazard Identification

Material Safety Data Sheets

Exposure Prevention: PPE

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Exposure Prevention: Administrative Contr...

Campus Emergencies

SFGH

Biological Exposure

Biological Exposure

The needlestick hotline responds to biological exposures such as:

- needlestick or bloodborne pathogen exposure
- toxins
- animal bites

For SFGH and SFVAMC, call 415-469-4411

For all other UCSF locations, call 353-7842 (353-STIC)



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Outline Thumbnails Notes Search

12. 8CCR 3380 PPE Std

00:40

8CCR 3380 PPE Std

When is PPE necessary?

What PPE is necessary?

How is PPE properly don, doff, adjust, and worn?

What are the limitations of selected PPE?

The proper care, maintenance, useful life ...

What are the proper use of engineering controls?

What are the PPE Training Responsibilities?

Introduction

The employer shall provide training to each employee who is required by this section to use PPE. Each such employee shall be trained to know at least the following

- When is PPE necessary?
- What PPE is necessary?
- How is PPE properly don, doff, adjust, and worn?
- What are the limitations of selected PPE?
- The proper care, maintenance, useful life and disposal of PPE.
- What are the proper use of engineering controls?
- What are the PPE Training Responsibilities?



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Outline Thumbnails Notes Search

12. 8CCR 3380 PPE Std

00:40

8CCR 3380 PPE Std

When is PPE necessary?

What PPE is necessary?

How is PPE properly don, doff, adjust, and worn?

What are the limitations of selected PPE?

The proper care, maintenance, useful life ...

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What are the PPE Training Responsibilities?

When is PPE necessary?

A workplace risk assessment must be conducted to determine if hazards are present, or are likely to be present, which require the use of PPE. It may also be necessary to wear PPE even when your neighbor is the one conducting hazardous work.



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Outline Thumbnails Notes Search

12. 8CCR 3380 PPE Std

00:40

8CCR 3380 PPE Std

When is PPE necessary?

What PPE is necessary?

How is PPE properly don, doff, adjust, and worn?

What are the limitations of selected PPE?

The proper care, maintenance, useful life ...

What are the proper use of engineering controls?

What are the PPE Training Responsibilities?

What PPE is necessary?

Selection of PPE is dependent on material being used. Full-length lab coat, gloves and safety glasses are sufficient for most procedures however upgrade to higher protection may be necessary. Example, use of large volume of chemicals requires use of a face shield rather than safety glasses or goggles.



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12. 8CCR 3380 PPE Std

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8CCR 3380 PPE Std

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What are the limitations of selected PPE?

The proper care, maintenance, useful life ...

What are the proper use of engineering controls?

What are the PPE Training Responsibilities?

How is PPE properly don, doff, adjust, and worn?



Careful consideration must be given to comfort and fit. PPE that fits poorly will not provide the necessary protection. Protective devices are generally available in a variety of sizes. Care must be taken to ensure that the right size is selected. Adjustments should be made on an individual basis for a comfortable fit that will maintain the protective device in the proper position. Care should be taken in fitting devices for eye protection against dust and chemical splash to ensure the



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12. 8CCR 3380 PPE Std

00:40

8CCR 3380 PPE Std

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What PPE is necessary?

How is PPE properly don, doff, adjust, and worn?

What are the limitations of selected PPE?

The proper care, maintenance, useful life ...

What are the proper use of engineering controls?

What are the PPE Training Responsibilities?

What are the limitations of selected PPE?

The basic lab coat, latex gloves and safety glasses may not be sufficient protection due to the type of material being handled. For the right type of gloves, refer to the [Glove Selection Guide](#). For pyrophoric chemicals, fire-resistant PPE is required.



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12. 8CCR 3380 PPE Std

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8CCR 3380 PPE Std

When is PPE necessary?

What PPE is necessary?

How is PPE properly don, doff, adjust, and worn?

What are the limitations of selected PPE?

The proper care, maintenance, useful life ...

What are the proper use of engineering controls?

What are the PPE Training Responsibilities?

The proper care, maintenance, useful life and dispos...

Follow manufacturer's proper cleaning and maintenance procedures. Stored in a clean and dry space away from possible contaminants. Prior to donning PPE, inspect for breakage. Remove and replace PPE immediately when contamination or damage is observed. Dispose PPE as hazardous waste.



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12. 8CCR 3380 PPE Std

00:40

8CCR 3380 PPE Std

When is PPE necessary?

What PPE is necessary?

How is PPE properly don, doff, adjust, and worn?

What are the limitations of selected PPE?

The proper care, maintenance, useful life ...

What are the proper use of engineering controls?

What are the PPE Training Responsibilities?

What are the proper use of engineering controls?

If use of a chemical fume hood is not possible and respiratory protection is needed, refer to the [Respiratory Protection Program](#) or call the EH&S Industrial Hygienist at 415-476-1300



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12. 8CCR 3380 PPE Std

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When is PPE necessary?

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What are the limitations of selected PPE?

The proper care, maintenance, useful life ...

What are the proper use of engineering controls?

What are the PPE Training Responsibilities?

What are the PPE Training Responsibilities?

The Principal Investigator and Lab Supervisor must conduct lab-specific training on the use of PPE prior to start of work. Training must be documented and available for inspection.



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13. Emergency Preparedness

00:55

Introduction

Before beginning work in the laboratory, make note of the location of the following items: the laboratory's emergency action plan, emergency exits and evacuation routes, emergency telephone numbers, spill clean-up kits, eyewashes and deluge showers, and fire extinguishers.

Tab 1: Emergency Action Plan (EAP)

Your EAP is a written plan that describes what to do in case of a natural disaster or other emergencies. It includes: evacuation routes, names of floor wardens/and or emergency coordinators, the location of your emergency assembly area, a list of employees, list and location of emergency supplies, list of staff with emergency skills, and vital assignments and record protection plan

Emergency Preparedness

- Emergency Action Pl...
- Showers and Eyewa...
- Earthquake Prepare...
- During/After an Eart...
- Fire Prevention
- Fire Extinguishers
- PASS
- RACE
- Storage
- Electrical Safety

Introduction

Before beginning work in the laboratory make note of the location of the following:

- Emergency Action Plan (EAP)
- Emergency exits and evacuation routes
- Emergency telephone numbers
- Spill clean-up kits
- Eyewash and deluge showers
- Fire extinguishers





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13. Emergency Preparedness

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Emergency Action Plan

Your EAP is a written plan that describes what to do in case of a natural disaster or other emergencies.

Your EAP includes

- evacuation routes
- floor wardens
- emergency coordinators
- emergency assembly area
- list of employees
- emergency supplies
- list of staff with emergency skills
- vital assignments and record protection plan



Locations of EAP

- Department Management Service Officer (MSO)
- Posted in a common area of the laboratory

Laboratory members must know the contents of their department EAP .

Click [here](#) to see more information about **Emergency Action Plans.**



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13. Emergency Preparedness

00:55

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Emergency Preparedness

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Storage

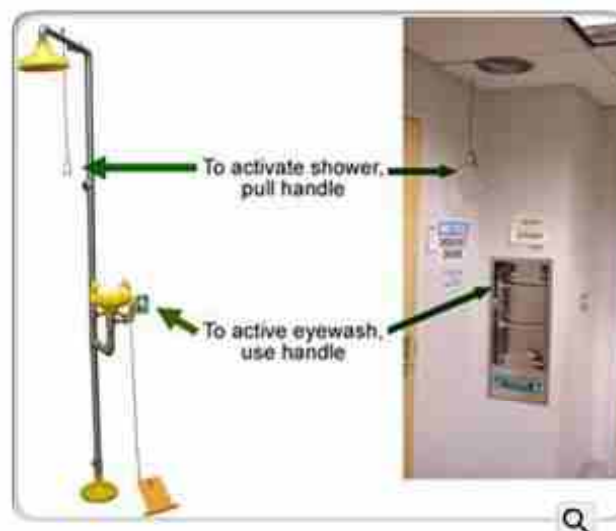
Electrical Safety

Showers and Eyewashes

All laboratories must have access to a working eyewash and shower.

If there is an accidental exposure to hazardous material

- Flush exposed area with copious amounts of water for



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13. Emergency Preparedness

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Earthquake Preparedness

Before an earthquake

- Secure bookcases, cabinets or other equipment.
- Store heavy items on lower shelves.
- Shelves holding chemicals MUST have seismic lips.
- Determine a good place to wait out an earthquake.
- Know your exit route and assembly area.
- Assemble emergency supplies.



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13. Emergency Preparedness

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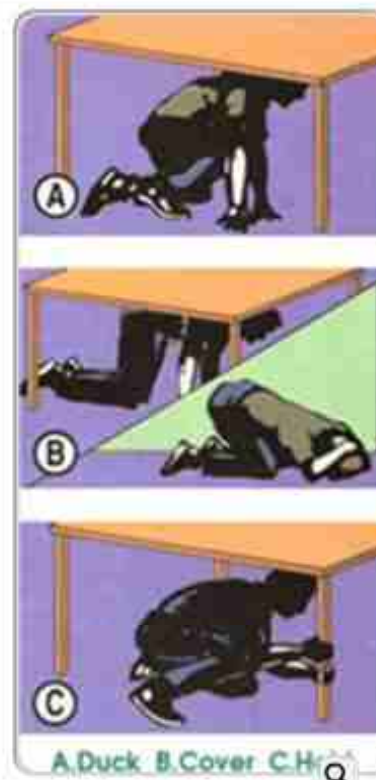
During/After an Earthquake

During an earthquake, if you are in a building, seek cover under a sturdy table and

- A. Duck
- B. Cover
- C. Hold

After an earthquake

- Do not exit or use the elevator
- Do not smoke, use matches or other open flame devices
- Report to assembly area



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Introduction

Before beginning work in the laboratory, make note of the location of the following items: the laboratory's emergency action plan, emergency exits and evacuation routes, emergency telephone numbers, spill clean-up kits, eyewashes and deluge showers, and fire extinguishers.

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Fire Prevention

One of the most common causes of laboratory fires is contact of solvent fumes with an open flame, for example a Bunsen burner.

To prevent fires

- Use the smallest possible quantities of flammable solvents.
- Store manufacturers containers in approved cabinets.
- Separate flammable solvents from sources of ignition.
- Never use a Bunsen burner in any area where flammable solvents are handled
- Never leave a Bunsen burner unattended.



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13. Emergency Preparedness

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Fire Extinguishers

UCSF laboratories are equipped with the following: type ABC extinguishers to cover the widest possible range of materials.

	Common materials such as paper, wood or most other combustibles	
	Flammable liquids such as gasoline, paint remover or grease	
	Electrical fires	
	Combustible metals usually found in industry	



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13. Emergency Preparedness

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- RACE
- Storage
- Electrical Safety

PASS

Only use a fire extinguisher when

- it is the appropriate type
- the fire is relatively small
- you do not have respiratory problems
- you have been trained in using a fire extinguisher



Remember the acronym "PASS"

- **P**ull the pin
- **A**im at the base of the flame
- **S**queeze the lever to discharge
- **S**weep using side to side motion



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13. Emergency Preparedness

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- RACE
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- Electrical Safety

RACE

In case of fire, remember the acronym **RACE**:

Rescue the injured or anyone in immediate danger so long as you do not put yourself at greater risk.

Alert others by activating the fire alarm and calling for emergency response.

Contain the fire and smoke by closing doors and windows

Evacuate/**E**xtinguish
Evacuate the area and proceed to the designated assembly location.



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13. Emergency Preparedness

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Emergency Preparedness



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Fire Prevention

Fire Extinguishers

PASS

RACE

Storage

Electrical Safety

Storage

- Maintain ceiling clearance of 18 inches in rooms with fire sprinklers and 24 inches in rooms without fire sprinklers.
- In some labs, this will require leaving the highest storage shelf empty to ensure the plane of clearance extends across the entire room.



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13. Emergency Preparedness

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Storage

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Electrical Safety

Common electrical hazards include

- Old or defective electrical equipment
- Old, frayed, and/or exposed wiring
- Overloading circuits with high-energy and/or too much equipment
- Inadequate safety procedures when working on energized equipment or systems
- Inadequate training or lack of familiarity with equipment



Do not use extension cords in laboratories or offices.

Contact Facilities Management to repair/remove hazardous equipment.



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15. Section 2: UCSF Safety Programs

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Section 2: Specific Safety Programs
Procedures for working with certain classes of hazardous materials and controlled substances are covered by the following programs: controlled substances, radiation safety, and biological safety

Section 2

UCSF Safety Programs



This section focuses on procedures for working with certain classes of hazardous materials. This includes the following programs: controlled substances, radiation safety, and biological safety.



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16. Section 2 Overview

00:28

Section 2 Objectives
 When you have completed this section, you will be able to

- Describe the safety practices and policies for controlled substances
- Describe the safety practices and policies for radiation safety
- Describe the safety practices and policies for biological safety

Section 2 Overview

Objectives

When you have completed this section, you will be able to

- Describe the safety practices and policies for controlled substances
- Describe the safety practices and policies for radiation safety
- Describe the safety practices and policies for Biological safety

Topics

- Controlled substances safety
- Radiation safety
- Biological safety

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Controlled Substances Safety

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17. Controlled Substances Safety

00:28

Controlled Substances
 Before working with controlled substances, you must

- be listed on your PI's Controlled Substances Authorization (CSA).
- read the Controlled Substances Manual.
- take Controlled Substances training.

Click the link to view the Controlled Substances Program Page or click the Attachments tab and select Controlled Substances Program Manual.

Before working with controlled substances, you must

- be listed on your PI's Controlled Substances Authorization (CSA).
- read the Controlled Substances Manual.
- take Controlled Substances training.

Click [here](#) to view the Controlled Substances Program Page or click the Attachments tab and select Controlled Substances Program Manual.

Office of Research: Environmental Health and Safety

Controlled Substances Program Manual Table of Contents

- 1 GENERAL REQUIREMENTS
 - [Purpose and Scope](#)
 - [Who is authorized to join the program?](#)
 - 1. Eligibility to Petition
 - 2. Petition Process
 - 3. Eligibility to Co-Authorize Personnel
 - 4. Eligibility to receive CSA chemicals
 - [Program Enrollment](#)
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 - [Responsibilities](#)
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 - 2. Faculty Member Participate
 - 3. Office of Environmental Health & Safety (OEH&S)
 - 4. OHSU Chemical Procurement & Storage Contracts
 - 5. UCSF Policy
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Radiation Safety

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18. Radiation Safety

00:28

Radioactive Materials

Before working with radioactive materials you must

- be listed on your PI's Radioactive Use Authorization (RUA)
- be familiar with the Radiation Safety Training Manual and
- take Radiation Safety Training.

Click the link to view the EH&S Radiation Safety page.

For information on disposal, refer to section 6 of the Radiation Safety Training Manual.

For detailed information, click the Attachments tab and select Radiation Safety Manual.

Before working with radioactive materials you must

- be listed on your PI's Radioactive Use Authorization (RUA)
- be familiar with the Radiation Safety Training Manual
- take Radiation Safety Training.

Click [here](#) to view the EH&S Radiation Safety page.

For information on disposal, refer to section 6 of the [Radiation Safety Training Manual](#).

For detailed information, click the Attachments tab and select Radiation Safety Manual.

Office of Research: Environmental Health and Safety



[Home](#) > [Radiation Safety](#)

Radiation Safety



Guidelines for radiation protection are based upon an underlying philosophy in which two factors are of prime importance.

First is the assumption that there is no radiation dose so small that it does not involve some degree of risk.

The second major factor to consider is that radiation, like many other developments of modern life, confers great benefits upon both the individual and the society in spite of its small risk to health. Consideration of the extent of these benefits makes a certain degree of risk acceptable. [Learn More](#)





Biological Safety

The Biological Safety Program/IBC

Risk Groups

Biosafety Levels

Needlesticks

Required Biosafety Training

Biohazards

Biohazards are organisms or materials that could present a potential exposure to human pathogens.

This includes the use of

- infectious agents
- toxins
- human blood and body fluids
- any tissue, organ, or cell culture of human origin
- Old World primates or sheep



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19. Biological Safety

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Biological Safety

Introduction: Biohazards

Biohazards are organisms or materials that could present a potential exposure to human pathogens.

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Tab 1: Biological Safety Program

The Biological Safety Program focuses on the prevention of laboratory-associated exposures and environmental releases in laboratories conducting experiments involving biological materials.

The IBC issues Biological



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19. Biological Safety

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The Biological Safety Program/IBC

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The Biological Safety Program/IBC

The Biological Safety Program focuses on the prevention of laboratory-associated exposures and environmental releases in laboratories conducting experiments involving biological materials.



The Biological Safety Program is led by:

- the Campus Biosafety Officer
- the Institutional Biosafety Committee (IBC).

The IBC issues Biological Materials Use Authorizations (BUAs) to laboratories which authorize research with biological materials. To use biological materials, you must be listed on your PI's BUA and undergo specific training.

Click [here](#) to access the EH&S Biological Safety page.



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Risk Groups

Biohazardous agents are classified into four risk groups (RGs) according to their pathogenicity in healthy adult humans. Click the image below to see the risk groups.

Risk Group	Basis for classification	Example of Agents
1	Agents do not cause disease in healthy adult humans	Escherichia coli K12; asporogenic Bacillus subtilis, Saccharomyces cerevisiae, bacteriophages, Baculovirus
2	Agents cause disease but rarely serious; vaccines or treatment usually available	Salmonella, staphylococcus aureus; listeria monocytogenes; adenoviruses and lentiviruses (including replication-defective strains)
3	Agents cause serious or lethal human disease; vaccines or treatment may be available; infection usually via inhalation	Mycobacterium tuberculosis, Coxiella burnetii, Yersinia pestis, Histoplasma capsulatum; St Louis Encephalitis virus
4	Agents cause serious or lethal human disease; vaccines or treatment not usually available	Ebola, Junin, Machupo, Ebola and Marburg viruses and Herpesvirus simiae B cultures



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19. Biological Safety

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Biological Safety

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The Biological Safety Program/IBC

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Required Biosafety Training

Biosafety Levels

- Laboratories at UCSF are divided into 3 biosafety containment levels.
- Most UCSF labs are BSL1 or BSL2 with a few at BSL3.

The chart below illustrates these biosafety levels.

BSL 1	BSL 2	BSL 3
Suitable for work involving well-characterized agents not known to consistently cause disease in immunocompetent adult humans, and present minimal potential hazard to laboratory personnel and the environment	Suitable for work involving agents that pose moderate hazards to personnel and the environment (RG2 materials)	Applicable to clinical, diagnostic, teaching, research, or production facilities where work is performed with indigenous or exotic agents that may cause serious or potentially lethal disease through the inhalation route of exposure.



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The Biological Safety Program/IBC

Risk Groups

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Needlesticks

Required Biosafety Training

Needlesticks

Many accidental needlesticks occur when staff are recapping needles. Recapping a needle is very strongly discouraged.

To avoid a needlestick,

- dispose of needles immediately without recapping them
- do not bend or break a needle
- do **not** remove a needle from the syringe by hand
- never bend or shear needles.

If you must recap a needle, UCSF policy requires that you use the "one-hand" needle recapping technique shown here. To learn this technique, contact a Biosafety Officer.

Click [here](#) for more information on handling sharps.



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Biological Safety

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The IBC issues Biological

The Biological Safety Program/IBC

Risk Groups

Biosafety Levels

Needlesticks

Required Biosafety Training

Required Biosafety Training

- Members of laboratories with BUAs are required to be compliant with regards to biosafety training.
- PIs must ensure that all personnel working in their labs are sufficiently trained in basic microbiological and in lab-specific techniques.
- PIs must also take all training applicable to their BUAs.

This [chart](#) illustrates the training required by UCSF for users of specific biological materials.



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Outline Thumbnails Notes Search

20. Managing Biohazardous Waste

00:55

Introduction: Biohazardous Waste

Biohazardous waste is laboratory waste generated in biomedical research labs and contaminated with an infectious agent that poses a threat to human health, animals, or the environment.

There are 4 kinds:

- Solid pathological waste
- Solid biohazardous waste
- Liquid biohazardous waste
- Sharps waste

Click the link for details on managing biohazardous waste,

Tab 1: Solid Pathological Waste

RG2 solid biohazardous waste must be segregated into two groups and placed in different containers. It must be placed in a pathological waste container and incinerated by an outside company.

This category of waste includes

Managing Biohazardous Waste

Solid Pathological Waste

Solid Biohazardous Waste

rDNA Waste

Liquid Biohazardous Waste

Sharps Waste

Disposing of Biohazardou...

Disposal, continued

Safe vs. Unsafe Solid Bio...

Biohazardous Waste Con...

Pickup Containers

What is Biohazardous Waste?

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Click [here](#) for details on managing biohazardous waste.



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Pickup Containers

Solid Pathological Waste

RG2 solid biohazardous waste must be segregated into two groups and placed in different containers.



Solid pathological waste must be placed in a pathological waste container and incinerated by an outside company.

This category of waste includes:

- Waste from BSL3 facilities
- Animal tissue >1 cubic inch and animal carcasses
- Human tissue >1 cubic inch



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Biohazardous Waste Con...

Pickup Containers

Solid Biohazardous Waste

Solid biological waste must be placed in a biohazardous waste container and autoclaved by an outside company. This includes lab items or cultures known or strongly suspected to contain RG2 human pathogens:



- diagnostic specimens
- human source material
- agents infectious to humans or animals
- cultures from human or animal specimens
- bacterial or viral culture or spore production
- microbial cultures
- live or attenuated vaccines used in research



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Pickup Containers

rDNA Waste

The NIH requires some BSL1 Recombinant DNA waste to be disposed as biohazardous waste. For details, refer to this [Safety Update](#).

If the laboratory autoclaves biohazardous waste, the following are required:

- The lab must have an established autoclave SOP
- The lab must conduct a monthly spore test and document the results
- Annual vendor maintenance including thermometer calibration
- Annual EH&S certification

All BSL3 waste must be autoclaved prior to disposal as biohazardous waste.



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20. Managing Biohazardous Waste

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Pickup Containers

Liquid Biohazardous Waste

Liquid biohazardous waste includes contents from:



- Vacuum traps
- Decanted tissue culture medium
- Liquid microbial cultures
- Human or primate blood, serum, or other body fluids

Decontamination

Liquid biohazardous waste must be decontaminated by mixing one volume of undiluted bleach with nine volumes of liquid biohazardous waste (final dilution of 1:10) for 30 minutes. Once decontaminated as described, this type of waste can be drain-disposed if not mixed with chemical or radioactive material.



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Pickup Containers

Sharps Waste

Sharps include needles (suture, hypodermic, etc.), blades (scalpel, razor, etc.) and other items with edges or protuberances capable of cutting or piercing.

- Dispose of sharps in approved sharps disposal containers.
- Do NOT fill container past designated fill line.
- Sharps waste must NEVER protrude from waste container.

Click [here](#) for detailed procedures on disposal of sharps



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Pickup Containers

Disposing of Biohazardous Waste

The generation, collection, packaging, and subsequent disposal of biohazardous waste must be consistent with the Campus, State, and local requirements. The basic requirements are:

- Medical/biohazardous waste must be segregated and physically separated from other wastes.
- Avoid mixing medical/biohazardous waste with chemical or radioactive materials.
- Put solid medical waste in labeled red biohazardous waste bags.
- Do not place biohazardous waste bags directly on the floor due to potential for breaks and leaks.
- Do not store waste in hallway.
- Full bags must be tied or taped closed and disposed of in gray pickup containers lined with red bags
- Lab containers may not be overfilled.
- Dispose of red biohazard bags at least once a week.



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Pickup Containers

Disposal, continued

When transporting waste from laboratory biohazardous waste containers to biohazardous waste pickup containers:

- wear personal protective equipment (e.g., lab coat, gloves, safety glasses) to prevent potential contact with and exposure to infectious material
- change gloves that may be contaminated
- seal the biohazard bag closed (tape, rubber band, etc.)
- the biohazard bag must be secondarily contained during transport in a labeled biohazard container with a lid.
- carry the biohazard bag to the nearest medical waste pickup container
- do NOT touch doorknobs or other clean surfaces with gloved hands
- wash hands after removing gloves.

Consult your Environmental Health & Safety Specialist before starting an experiment if there will be chemicals or radioactive materials mixed with biohazardous waste.

Click [here](#) for details on disposing of biohazardous waste.



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Pickup Containers

Safe vs. Unsafe Solid Biohazardous Waste Disposal

This picture shows important differences between safe and unsafe solid waste disposal.

Safe



Safe

- Biohazardous waste bag in a hard-sided container
- Fitted lid in place
- Biohazard labels visible

Unsafe



Unsafe

- Biohazardous waste bag on the floor
- Biohazardous waste bag NOT stored in a hard-sided container



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Biohazardous Waste Containers

The basic requirements for biohazardous waste containers are:

- Biohazardous waste bags must be either RED and labeled with either the words "Biohazardous Waste" or with a biohazard symbol and the word "Biohazard."
- Biohazardous waste containers must be rigid and leakproof, with a tight-fitting lid, and preferably a foot pedal to operate the lid.
- The lid should be kept closed whenever waste is not being actively added to the bag to prevent the spread of potentially infectious agents or material.
- The lids must be cleaned once a week.
- The labels on the container must be visible once a biohazardous waste bag is added.
- Containers must be lined with biohazardous waste bags before adding the waste.
- Biohazardous waste containers need to be placed in the laboratories near the point of biohazardous waste generation

OEHS recommends medical waste containers to ensure compliance with the California Medical Waste Management regulations.

Click the Attachments tab and select the file **Recommended Medical Waste Containers**. Save it to for later reference.



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Pickup Containers

Pickup Containers

Environmental Services and Facilities Management's Building Services are responsible for collecting biohazardous medical waste at the medical centers and some campus research laboratories.

- The waste is collected from specified pickup containers.
- The pickup containers are usually gray in color, except for red pathology containers.
- They are pre-labeled with biohazard symbols and the word "Biohazard."
- Medical/biohazardous waste collected in laboratory waste containers must be transferred to these pickup containers for pickup.
- Laboratory waste in red bags must be transferred weekly.



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22. Section 3: Managing Hazardous Chemicals

00:15

Section 2: Chemical Safety
This section focuses on the safe use of chemicals used in research at UCSF and the proper management of hazardous chemical wastes.

Section 3

Managing Hazardous Chemicals



This section focuses on the safe use of chemicals used in research at UCSF and the proper management of hazardous chemical wastes.



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Section 3 Overview

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23. Section 3 Overview

00:28

Section 3 Objectives
 When you have completed this section, you will be able to

- Describe the safety practices and policies for chemical safety
- Describe the safety practices and policies for fume hood safety
- Explain basic hazardous waste management requirements

Objectives

When you have completed this section, you will be able to

- Describe the safety practices and policies for chemical safety
- Describe the safety practices and policies for fume hood safety
- Discuss basic hazardous chemical waste management requirements

Topics

- chemical safety
- fume hood safety
- the requirements for the storage and disposal of hazardous chemical waste

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24. Chemical Safety

01:10

Introduction:
 Prevention of exposure to hazardous chemicals is an integral element of your health and safety.
 Be familiar with the hazards of all chemicals in your work area.
 Know the specific hazards of materials or procedures you use in the laboratory
 Be prepared for accidental exposures to chemical hazards
 chemical containers must be appropriately labeled, addressing the hazards related to the chemical.

Tab 1: Chemical Hygiene Plan
 The Cal-OSHA Laboratory Safety Standard requires all employers to have a Chemical Hygiene Plan.
 At UCSF, the Chemical Hygiene Plan is the Chemical Safety Manual.

Chemical Safety

- Chemical Hygiene Plan
- Material Safety Data ...
- Exposure routes
- Signs and Symptoms ...
- Exposure prevention ...
- Chemical Labeling
- NFPA Labeling
- Chemical Storage
- Water Reactive Che...
- Air Reactive Chemicals
- Pyrophoric Chemical ...
- Regulated Chemical ...
- Specialized Training ...

Introduction

Prevention of exposure to hazardous chemicals is an integral element of your health and safety.

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Signs and Symptoms ...

Exposure prevention ...

Chemical Labeling

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Chemical Hygiene Plan

The Cal-OSHA Laboratory Safety Standard requires all employers to have a **Chemical Hygiene Plan**.

At UCSF, the **Chemical Hygiene Plan** is the **Chemical Safety Manual**.

Click the **Attachments** tab and select **Chemical Safety Manual**.

Save it to your computer for future reference



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Material Safety Data Sheets

Material Safety Data Sheets (MSDS) are available at the OEHS website. You must be familiar with the information provided in the MSDS when working with chemicals.



An MSDS provides the following information:

- Chemical identity, manufacturer, and CAS number
- Physical and chemical characteristics
- Hazardous ingredients
- Fire and explosion data
- Precautions for safe handling and use
- Reactivity data
- Control measures
- Health hazard data
- Personal protective equipment on the safe handling, storage, and disposal of chemicals.

Click the **MSDS** tab next to the **Attachments** tab for more information.

Click [here](#) to open the **MSDS** information page.



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Exposure routes

Routes of exposure to hazardous chemicals are

- **Skin (percutaneous):** needle sticks, broken glass, razor blades
- **Inhalation:** (breathing fumes) the most common route of exposure
- **Eyes:** fluid splashes or when an aerosol is created from centrifuging
- **Non-intact skin contact:** unprotected skin can be susceptible to exposure to chemicals and infectious agents
- **Ingestion:** when you have contact with chemicals or animal feces and urine and contaminated gloves and dirty hands were then used to handle food or beverages.



Eating and drinking are not allowed in laboratories. Do not dispose or store food anywhere within your laboratory.



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Signs and Symptoms of Chemical Exposure

- Nose and throat irritation
- Skin irritation
- Digestive or abdominal discomfort and nausea
- Point inflammation .
- Decline in mental acuity



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Exposure prevention and Treatment

Before working with chemicals

- Complete all required training
- Know specific hazards of materials (Read the MSDS)
- Wear personal protective equipment (PPE).

If you are exposed while working

- Notify your supervisor.
- Go to emergency room and bring a copy of the material safety data sheet (MSDS).
- Notify Occupational Health Services of the location, time, date and identity of the material to which you have been exposed.



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Chemical Labeling

If you transfer a chemical from the manufacturer's container into a another container, you must label the new container. The label must include



- the chemical name (not a chemical formula)
- identity of chemical hazard (e.g., flammable, corrosive, oxidizer, etc.)
- special precautions
- expiration date

You will find this information on the MSDS for the chemical you are handling.

Chemical labels must be legible and understandable for outside personnel, such as the UCSF Emergency Response Team (ERT) or the San Francisco Fire Department (SFFD).



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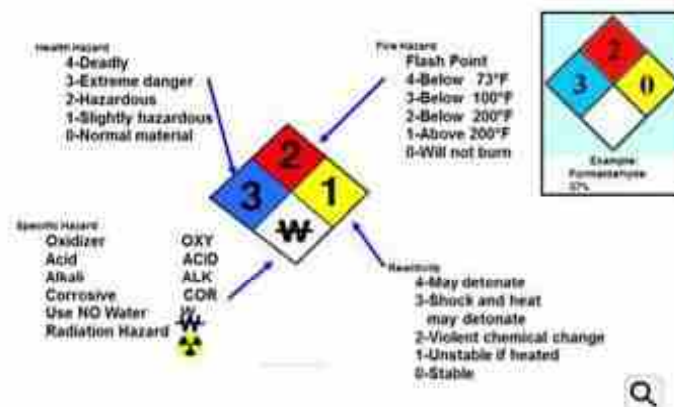
Regulated Chemical ...

Specialized Training ...

NFPA Labeling

The National Fire Protection Association's labeling system shows the type and the degree of a chemical hazard.

- Blue represents health hazard
- Red represents fire hazard
- Yellow represents reactivity





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- Specialized Training ...

Chemical Storage

Hazardous chemicals must be stored according to strict safety guidelines.

Segregate chemicals by compatibility:

- flammables
- oxidizers
- acids
- bases

Storage:

- Do NOT store chemicals above eye level
- Chemical containers must have tight fitting lids or caps
- Store in the upright position to avoid spills
- Store heavy chemical containers on lower shelves
- Store chemicals on shelves with raised edges



For detailed information, click the **Attachments** tab and select **Chemical Storage Chart** or **Chemical Storage Guidelines**.

The **Chemical Storage Guidelines** tab (next to the **Attachments** tab) also provides detailed information.



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24. Chemical Safety

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Introduction:

Prevention of exposure to hazardous chemicals is an integral element of your health and safety.

Be familiar with the hazards of all chemicals in your work area.

Know the specific hazards of materials or procedures you use in the laboratory

Be prepared for accidental exposures to chemical hazards chemical containers must be appropriately labeled, addressing the hazards related to the chemical.

Tab 1: Chemical Hygiene Plan
The Cal-OSHA Laboratory Safety Standard requires all employers to have a Chemical Hygiene Plan. At UCSF, the Chemical Hygiene Plan is the Chemical Safety Manual.

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Water Reactive Che...

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Water Reactive Chemicals

Here are some examples of Water Reactive Chemicals.

Examples Alkali metals such as sodium, potassium, lithium

Characteristics Reacts with water, possibly violently

Protection Required

- Store in safe containers and keep away from water
- Total cover for skin where exposure is possible
- Use self-contained air supply in places where fumes may be generated.
- PPE: safety goggles, appropriate gloves, face shields, safety shields, non-flammable lab coats and aprons

Hazardous Effects

- Develops toxic, explosive, or corrosive fumes
- Upon contact with water, can result in explosion if the reaction is forced to confinement.

First Aid Treatment

- Eye of skin exposure: flush with water for 15 minutes.
- Inhalation exposure : immediately evacuate outdoors to fresh air.
- Ingestion: seek immediate medical attention.



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Air Reactive Chemicals

Here are some examples of Air Reactive Chemicals.

Examples Alkali metals, ammonium nitrate, ammonium perchlorate, ammonium permanganate, benzoyl peroxide, boron hydrides, dinitrobenzene, lithium hydride, sulfur

Characteristics Capable of rapid release of energy by themselves, as by self-reaction or polymerization

Protection Required

- Store in safe containers and racks away from air exposure.
- Total cover for skin where exposure is possible.
- PPE: Safety goggles, appropriate gloves, face shields, safety shields, non-flammable lab coats and aprons

Hazardous Effects Flammable upon contact with air can result in explosion if the reaction is forced to confinement

First Aid Treatment

- Eye or skin exposure: flush with water for 15 minutes.
- Inhalation: immediately evacuate to fresh air
- Ingestion: seek immediate medical attention



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Pyrophoric Chemical Safety

Pyrophoric compounds ignite spontaneously when exposed to air. Many pyrophoric materials also react with water. Special training is required to store and handle these materials safely.

- Before working with pyrophoric materials,
- Remove unused equipment and flammable materials from area.
 - Never work alone with pyrophoric materials.
 - Ensure that a proper fire extinguisher is available.
 - Know where your nearest eyewash/shower is located.
 - Use proper personal protective equipment: safety goggles, face shields, flame resistant gloves, aprons and lab coat approved for work with pyrophorics, shown at right
 - Perform work operations in an inert atmosphere glove box and inside a fume hood.



For details, click the **Attachments** tab and select **Procedures for Safe Use of Pyrophoric Organolithium Reagents.**



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Regulated Chemical Carcinogens

Before commencing your laboratory work, determine if you will be working with any known or regulated carcinogens. If so complete the Carcinogen Training, available at Research Online. This training is required annually.

Click [here](#) to review the UCSF Chemical Carcinogen Program for instructions on appropriate procedures.

Office of Research, Environmental Health and Safety



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Specialized Training Requirements

The principal investigator is responsible to provide specialized training on the specific chemical hazards in your laboratory.

Check the EH&S website for additional information such as the Pyrophoric Procedures SOP.

Click [here](#) to find information on other online training required based on job assignment.





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Introduction

Laboratory fume hoods (LFHs) have several important safety functions including capturing, containing, and exhausting hazardous fumes, protecting users when handling hazardous and/or volatile chemicals, and radioactive materials, and protecting users from splashes, fires, minor explosions and exothermic reactions.

Tab 1: Types of fume Hoods
 LFH at UCSF are either constant air volume or variable air volume. A constant air volume LFH automatically adjusts face velocity by sash height. A variable air volume LFH automatically adjusts the exhausted air volume to maintain a constant airflow. To save energy, close LFH sash when hood is not in use. Always review the MSDS to determine the

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LFH have several important safety functions, including

- capturing, containing, and exhausting hazardous fumes
- protecting users when handling hazardous and/or volatile chemicals, and radioactive materials
- protecting users from splashes, fires, minor explosions and exothermic reactions.



For more information about using fume hoods safely, click the **Fume Hood Safety** tab in the bar at the top of this page..



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Types of Fume Hoods at UCSF

1. Constant Air Volume - face velocity automatically adjusts with sash height **OR**

2. Variable Air Volume - exhaust air volume automatically adjusts to maintain a constant airflow



- OEHS tests all UCSF LFH annually for safe performance levels.

- For standard chemical use in both types of LFHs, face velocity must average at least 100 feet per minute (fpm)

- Carcinogens require an average linear face velocity of 150 feet per minute.

Always review the MSDS to determine the appropriate safety procedures and to ensure your LFH provides adequate protection for the type of chemical you are using.



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Many laboratory devices resemble fume hoods but are **not**. Chemical fume hoods carry volatile fumes away from the work area by ducting these fumes to outside the building.

Biosafety cabinets, laminar flow hoods, animal changing stations, sterile work stations, etc. are NOT accepted at UCSF for use with volatile chemicals

Contact your EH&S specialist if experiments require the use of volatile chemicals outside of a chemical fume hood.



Biosafety Cabinet

Laminar Flow Hoods



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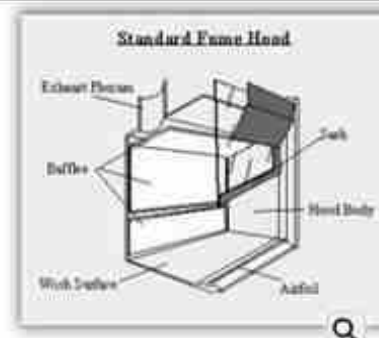
What to look for

Fume Hood Mainten...

Components of LFH

LFH are typically three sided enclosures with an adjustable sash (clear sliding window opening). Components of an LFH include:

- Exhaust plenum
- Baffles
- Sash
- Hood body
- Airfoil
- Work surface



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Airflow Monitors

All LFH at UCSF are required to have airflow monitors, which indicate whether or not it is operational before use.

There are three types of airflow monitors used at UCSF:

1. Digital airflow display monitors
2. Magnehelic differential pressure gage monitors
3. Incline manometer monitors





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Digital Airflow Display Monitor

The digital airflow display monitor shows the face velocity of the LFH.

- Green light indicates the unit is operational for use.
- Yellow light indicates that the unit must be checked soon.
- The red indicator light indicates that the LFH is not safe for use.

Contact **Facilities Management** if the red or yellow lights are glowing.



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Magnehelic differential pressure gauge monitor

- If the indicator is between the colored arrows the LFH is functioning properly.
- If the indicator is not between the colored arrows, LFH is not operating properly. Contact Facilities Management.
- If the gauge does not have indicators, note readings during normal operating conditions.



Contact Facilities Management if the readings differ by 15% from the normal readings.



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Incline Manometer Monitor

- If the red liquid is between the red and green arrows, the LFH is providing adequate protection.
- If red liquid is outside the red and green arrows, the LFH is not safe for use. Contact Facilities Management.
- If the manometer does not have red and green arrows, note readings during normal operating conditions.



Contact Facilities Management if the readings differ by 15% from the normal readings



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What to look for

Constant air volume LFH the most common at UCSF. The Cal-OSHA Laboratory Standard requires annual inspections.

- Raising and lowering the sash will decrease or increase air flow through the fume hood.
- Lowering the sash will also help increase splash protection.



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Fume Hood Maintenance

If you suspect that your fume hood is not performing safely or if the unit has not been certified within the last year, STOP using the fume hood and contact your EH&S Specialist.

If your fume hood requires repair, contact Facilities Management.

For more information about using fume hoods safely, click the Fume Hood FAQs tab in the above right corner of the player.





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28. Hazardous Wastes Management

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Introduction

In order to protect both human health and the environment, regulations mandate controlling hazardous materials along every step of the their use, from cradle to grave. UCSF policy mandates that all laboratory staff attend the basic orientation training for laboratory workers provided by OEHS so that UCSF is in compliance with all regulatory requirements. Click the link for more information on hazardous waste management.

Tab 1: Hazardous Waste Definitions

UCSF laboratories must handle and store chemical waste separately according to the waste's characteristics. Wastes generated at UCSF are considered hazardous if they are listed in the hazardous waste regulations or have certain

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Introduction

In order to protect both human health and the environment, regulations mandate controlling hazardous materials along every step of the their use, from cradle to grave.

The California Health and Safety Code requires UCSF to train laboratory staff in handling hazardous waste.

This regulation is enforced by the San Francisco Department of Public Health under the Hazardous Materials Unified Program Agency (HMUPA) program.

For the purposes of this section, 'hazardous' refers to chemicals

Click [here](#) for more information on hazardous waste management.





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UCSF laboratories must handle and store waste separately according to the waste's characteristics.

A waste generated at UCSF is considered hazardous if it is listed in the hazardous waste regulations or have certain characteristics which make it hazardous, including:

- Ignitability/flammability
- Corrosivity
- Reactivity
- Toxicity

A waste also becomes hazardous when it is no longer needed or usable for its original intent.





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All hazardous waste is collected and disposed of by OEHS free of charge to the labs (exception: lab clean outs and major renovations).

Details are in [UCSF Chemical Safety Manual](#).

Chemical Safety Manual Contents

- [Introduction](#)
- [UCSF'S OBLIGATION TO PROTECT AND PROMOTE HEALTH](#)
- [A Responsibilities: The Role of Individual Persons](#)
- [B The Role of the Office of Environmental Health and Safety \(OEHS\)](#)
- [C The Function of the Office of Environmental Health and Safety \(OEHS\)](#)
- [D Agencies, Laws, and Regulations Pertaining to Chemical Safety at the University of California, San Francisco \(UCSF\)](#)
- [UCSF'S CHEMICAL STORAGE AND DISPOSAL POLICIES](#)
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General Rules

- Non-hazardous laboratory waste can be disposed through the drain or regular trash. Click [here](#) to access the List of Non-Hazardous Laboratory Waste.
- Evaporation is not allowed at UCSF.
- All hazardous wastes stored in laboratories must have a hazardous waste label.
- Hazardous waste must be segregated properly according to compatibility. Incompatible waste should be separated and/or segregated using secondary containment.
- Hazardous waste containers must always be closed unless you are adding waste to the container.
- Hazardous waste should not be stored on the floor without proper secondary containment.
- Ensure the container you are using is made of a material that is compatible to the waste.
- Never use empty chemical containers that contained a chemical which is incompatible with the waste you are storing. For example waste containing an oxidizer such as nitric acid should not be collected in an empty organic solvent bottle such as methanol



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Universal Waste

Universal waste is not hazardous to humans in its usual forms but is toxic to the environment and must be picked up for disposal. Examples include televisions, used oils, aerosol cans, computers and other electronic devices, shattered or cracked cathode ray tubes, batteries, dental amalgam, fluorescent lamps, mercury containing equipment.



Do not dispose of universal wastes in the regular trash. They must be picked up for disposal.

Click [here](#) or refer to Chapter 11 of the UCSF [Chemical Safety Manual](#) for more information.



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28. Hazardous Wastes Management

00:30

Introduction

In order to protect both human health and the environment, regulations mandate controlling hazardous materials along every step of their use, from cradle to grave. UCSF policy mandates that all laboratory staff attend the basic orientation training for laboratory workers provided by OEHS so that UCSF is in compliance with all regulatory requirements. Click the link for more information on hazardous waste management.

Tab 1: Hazardous Waste Definitions

UCSF laboratories must handle and store chemical waste separately according to the waste's characteristics. Wastes generated at UCSF are considered hazardous if they are listed in the hazardous waste regulations or have certain

Hazardous Wastes Management Next Slide

Hazardous Waste Definitions

UCSF Hazardous Waste Program

General Rules

Universal Waste

Emergency Response to a Chemical Spill

Emergency Response to a Chemical Spill

OEHS has prepared technical bulletins, available upon request, explaining how to deal with radioactive, chemical and biohazardous material spills. These guidelines will help you decide on the appropriate course of action.

Your response to a hazardous materials incident depends on your knowledge and preparedness, and the size and character of the incident.

Contact OEHS for information or training of a minor spill clean up. If a spill occurs, you must decide whether to handle it yourself or request advice/assistance from OEHS.

Click the **Attachments** tab and open the file named **What to do in case of a Spill**. For more detail, click the **Spills** tab next to the **Attachments** tab.



Tab 1: Hazardous Chemical Waste Storage

The following are some of the basic requirements for storing hazardous chemical waste:

- Store hazardous waste in a compatible container.
- If you reuse a container for waste, ensure that the original label is completely defaced and accurately relabeled.
- Store waste containers away from high traffic or areas accessible to the public.
- Store hazardous waste within an adequate secondary containment which provides 110 percent of the potential waste volume.
- Inspect the waste container regularly to make sure its integrity has not been compromised.

Managing Chemical Wastes**Hazardous Chemical Waste Storage**

Labeling: Online Tag Program

Completion of the Tag

Liquid Waste Storage

Collection and Disposal

Hazardous Chemical Waste Storage

- Store hazardous chemical waste in a compatible container.
- If you reuse a container for waste, ensure that the original label is completely defaced and accurately relabeled.
- Store waste containers away from high traffic or areas accessible to the public.
- Store hazardous waste within an adequate secondary containment which provides 110 percent of the potential waste volume.
- Inspect the waste container regularly to make sure its integrity has not been compromised.
- Temperature-sensitive hazardous waste materials may be stored in appropriate storage if required until pick-up occurs.
- Waste containers must always be closed securely when not actively in use.

For detailed information on chemical storage, click the tab **Chemical Storage Guidelines** in the bar at the top.





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29. Managing Chemical Wastes

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Tab 1: Hazardous Chemical Waste Storage

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Managing Chemical Wastes

Hazardous Chemical Waste Storage

Labeling: Online Tag Program

Completion of the Tag

Liquid Waste Storage

Collection and Disposal

Labeling: Online Tag Program

- Hazardous chemical waste must be clearly labeled
- Use the Online Tagging Program (OTP) method
- To obtain an OTP account, fill out the [OTP Account Request Form](#).
- email OTP@ehs.ucsf.edu to create an account.
- You can store the waste in your lab for 60 days. After 60 days, you will receive an email alert that waste pick-up is approaching.
- EH&S will pick it up in your designated storage location.

Click [here](#) to to learn more about the Online Tag Program.

Get a picture of the new tags.



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Managing Chemical Wastes

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29. Managing Chemical Wastes

00:25

Tab 1: Hazardous Chemical Waste Storage

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Hazardous Chemical Waste Storage

Labeling: Online Tag Program

Completion of the Tag

Liquid Waste Storage

Collection and Disposal

Completion of the Tag

1. Building and Room: where waste container is
2. PI: Generator of waste
3. Accumulation Start Date: Date when first waste was placed in the container
4. Hazard Class: Circle hazard class (ignitable, corrosive, toxic, reactive)
5. Chemical Name & Composition: Write chemical name and its composition
6. Physical State: circle the appropriate state (solid, liquid, gas)

Sample of a completed UCSF Hazardous Waste tag



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Tab 1: Hazardous Chemical Waste Storage

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Managing Chemical Wastes

Hazardous Chemical Waste Storage

Labeling: Online Tag Program

Completion of the Tag

Liquid Waste Storage

Collection and Disposal

Liquid Waste Storage

- Store liquid waste in compatible screw cap bottles. Containers without proper lids will not be picked up.
- Store chemically contaminated debris in transparent plastic bags inside a hard-sided container, e.g., a beaker or plastic bottle.
 - Bags with protruding glass or needles will not be picked up.
 - Colored plastic, biohazard bags, and paper bags are not acceptable
- Store semi-solid materials such as gels and paraffin wax in wide mouth plastic jars or bottles with screw caps.
- Store leaking containers inside larger screw top bottles or plastic buckets with snap-on lids. Leaking containers will not be picked up.



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29. Managing Chemical Wastes

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Tab 1: Hazardous Chemical Waste Storage

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Hazardous Chemical Waste Storage

Labeling: Online Tag Program

Completion of the Tag

Liquid Waste Storage

Collection and Disposal

Collection and Disposal

Hazardous chemical waste is collected and disposed of by OEHS free of charge to the labs (exception: lab clean outs and major renovations).

Details are in [UCSF Chemical Safety Manual](#).

Chemical Safety Manual Contents

- [Introduction](#)
- [UCSF'S OHS POLICY AND REGULATIONS](#)
 - A Responsibilities: The Role of Injured Parties
 - B The Role of the Office of Environmental Health and Safety (OEHS)
 - C The Function of the Office of Environmental Health and Safety (OEHS)
 - D Agencies, Laws, and Regulations Pertaining to Chemical Safety at the University of California, San Francisco (UCSF)
- [CHEMICAL CONTROL, PROCUREMENT, DISTRIBUTION, STORAGE](#)
 - A Purchasing Chemicals
 - B Transporting Chemicals
 - C Storing Chemicals
 - D Storage of Specific Classes of Chemicals
- [UCSF'S OCCUPATIONAL EXPOSURE MONITORING](#)
 - A Monitoring Requirements
 - B Employee Opportunity for Medical Consultation
 - C Registered Carcinogen Monitoring
- [UCSF'S HAZARDOUS WASTE MANAGEMENT PROGRAM](#)
 - A Product Practices for Handling Chemicals
 - B Inspections
- [UCSF'S HAZARDOUS WASTE/HAZARDOUS MATERIALS RESPONSE PLAN](#)
 - A Administrative Controls
 - B Engineering Controls
 - C General Facility Design
- [UCSF'S OHS](#)
 - A Requirements
 - B Terms



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