



# Lab Safety Seminar

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## Alphabet Soup

**EH&S, IIPP, EAP, SOP, CHP, LSP, PI,  
PPE, SDS, CIS, CUPA, BUA, RUA,  
LHAT**

**Department of Viticulture and Enology  
University of California, Davis**





# General Laboratory Safety

## “Don’ts”

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- *Don’t* eat, drink, chew gum or apply cosmetics where chemicals, radiation, or biological hazards are used
- *Don’t* store food in refrigerators or cold rooms with chemicals or other hazardous materials
- *Don’t* leave equipment or reactions to run unattended
- *Don’t* work alone in the lab after normal working hours without supervisor’s approval



*Don't leave a mess*





# Safety Seminar Topics

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## Injury and Illness Prevention Plan (IIPP) **Department**

- Chemical Hygiene Plan (CHP) **UC Davis**
- Lab Hazard Analysis, Standard Operating Procedures (SOP) **PI** (Principle Investigator)
- Training
  - Online UC Safety Training (UC Fundamentals of Laboratory Safety) **UCOP**
  - Site Specific Training Checklist (Site-Specific Safety Orientation & Training for New Laboratory Personnel) **PI** Chemical Inventory System (CIS) **PI**
- Safety Data Sheet (SDS) Global Harmonized System (GHS)
- Personal Protection Equipment (PPE) **PI**
- Emergency Action Plan (EAP) **Department**
- Hazardous Materials - Handling and Disposal: Lab Standard or Hazard Communication (HazCom) **PI** with **EH&S**

**Safety Services Resources - <http://safetyservices.ucdavis.edu/>**

# Injury and Illness Prevention Plan (IIPP)

- Management commitment/assignment of responsibilities
- Safety communications system with employees
- System for assuring employee compliance with safe work practices
- Scheduled inspections/evaluation system
- Procedures for correcting unsafe/unhealthy conditions
- Safety and health training and instruction
- Recordkeeping and documentation
- Accident Investigation





# ELEMENTS OF THE IIPP



# Campus Chemical Hygiene Plan

University of California, Davis

## CHEMICAL HYGIENE PLAN



v2.0  
April 2024



# Chemical Hygiene Plan (CHP)

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- Establishes a formal written program for managing the risks posed by health and safety hazards associated with the use of hazardous chemicals in laboratories
- The CHP describes the proper use, handling, storage and disposal practices and procedures to be followed
- Applies to employees who use chemicals in teaching and research laboratories at the UC Davis Campus
- Employer: Shall provide a workplace free from recognized hazards that may cause death or serious injury
- Employee: Shall comply with occupational safety and health standards, rules, regulations, and orders.





# Chemical Hygiene Plan (CHP)

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- Rights and Responsibilities (UC Office of the President and Board of Regents)
  - Campus Administration Policies and Procedures (Chancellor, Provost and Deans Offices)
  - Policy Specifics (Chemical and Laboratory Safety Committee)
  - PI Support and Enforcement (Department Chair)
  - **Site Specific Rules, Training, and Laboratory Safety Procedures (PI)**
  - Training, Standard Operating Procedures, Safety Data Sheets, Personal Protective Equipment (Personnel)
  - Information, Training Tools, Support, Inspections (EH&S)

# Online Tools

ehs.ucop.edu/

mc

he

Vanessa Lieberman  
UCD

VL

## Welcome to RSS Platform

### Action Items



You have no outstanding tasks. Any new tasks will appear here.

### Quick Links

[lis](#) [Begin a Biological Use Authorization](#)

[lis](#) [Manage PPE Inventories](#)

[stc](#) [My PPE Items](#)

### Workspace

1 - 5 of 25

Document	Type ↑	Status	Created
BUA-R1558	BUA	Approved	02/02/2017
BUA-R1637	BUA	Draft	01/22/2019
BUA-R1833	BUA	Deactivated	08/06/2021
BUA-R1875	BUA	Deactivated	02/19/2021

# Hazard Assessment (LHAT)

art My Workspace

mc

ass Harris Lab Assessment  
Certified [ Aug 23, 2021 - Aug 23, 2022 ]

Continue

This assessment evaluates the activities in a lab or research environment to identify potential hazards. These activities can pose chemical, physical, biological, radiological, laser and non-ionizing radiation hazards.

Group: [Harris Lab](#)

Rooms: Robert Mondavi Institute for Wine & Food Science - Building B (South) - 3221, 3221A

**Principal Investigator, Supervisor or other Responsible Person Details:**

Name: Linda Harris

Email: [ljharris@ucdavis.edu](mailto:ljharris@ucdavis.edu)

Phone: +1 530 754 9485

Document Name

Harris Lab Assessment

ACKNOWLEDGE

AMEND

✓ LHA Setup

✓ Roster

✓ Locations

✓ Chemical Hazards

✓ Physical Hazards

✓ Biological Hazards



# Laboratory Safety Training Check List

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- ☐ Take the online UC Laboratory Safety Fundamentals
- ☐ Complete site specific training, sign and date
- ☐ Complete any additional training assigned by your supervisor (Training Matrix)
- ☐ Review LHAT and view PPE video
- ☐ Obtain Personal Protective Equipment (PPE) as determined by the LHAT
- ☐ Receive training on conducting “Standard Operating Procedure” lab functions or “Prior Approval” procedures (specific reactions & equipment)
- ☐ Read and understand the IIPP, Emergency Action Plan (EAP) and Chemical Hygiene Plan (CHP)

**Training must be received for each separate location and for each PI and supervisor you work with. Hazards in each space may be different and training for all locations and all hazards is required.**

# UC Laboratory Safety Fundamentals

## UC Laboratory Safety Fundamentals

**This on-line course must be successfully completed by all existing laboratory personnel before any new worker is granted unescorted access to the laboratory**

Introduction to the UC Laboratory Safety Fundamentals, chemical safety, and general safety. This course covers relevant campus Laboratory Safety Manual(s) and rights/responsibilities according to applicable regulations



## Revised - 10/2013

I \_\_\_\_\_ confirm receipt of training on the listed topics on  
(print name, trainee)

I \_\_\_\_\_ from \_\_\_\_\_. All of my questions regarding \_\_\_\_\_  
(date) (print name, trainer)

this material have been answered. Topics have been initialed, or marked with an "X" where not applicable.

(signature, trainee)

(signature, trainer)

Initial	Topic	Action
<b>EMERGENCY PROCEDURES</b>		
	<b>Fire Alarm Pull Station:</b>	Show location(s) and proper activation.
	<b>Eye Wash / Safety Showers:</b>	Show location(s) and proper operation.
	<b>Chemical Spill Procedure</b>	Show location of spill kit(s), SafetyNets <a href="#">#13</a> and <a href="#">#127</a> (if applicable), and describe procedures.
	<b>First Aid Kits:</b>	Location(s) and description of contents.
	<b>Phone:</b>	Location(s), detail dialing instructions, '911' dialing instructions, bomb threat card.
	<b>Emergency Response Guide:</b>	Location(s) of flipchart guide, discuss scenario actions
	<b>Emergency Action Plan:</b>	Review Emergency Action Plan. Demonstrate both paths to Emergency Assembly Area. Review evacuation procedures for disabled employees if applicable.
	<b>Warn Me:</b>	Enroll in UC Davis <a href="#">Warn Me</a> emergency alert system, recommend registering cellular phone number.
<b>ENGINEERING CONTROLS</b>		
	<b>Chemical Fume Hood(s):</b>	Demonstration of proper use, instruction on adjustable controls, flow sensor function, and training requirements.
	<b>Biological Safety Cabinet(s):</b>	Demonstration of proper use, instruction on adjustable controls and training requirements.

# Site Specific Training

# Training Matrix

## WHAT:

This document outlines the minimum medical & training requirements for personnel working in a research setting at UC Davis. Answer the questions below to determine which requirements apply to you. If you answer "Yes", the corresponding requirements apply. It is recommended that you complete the requirements in the numeric order listed below. Note, this matrix does not include site-specific training or research-specific training that must be completed.

## WHO:

Principal Investigators (PI), lab supervisors, research personnel, volunteers, graduate & undergraduate students in research laboratories as well as general staff working in laboratories and animal housing facilities.

Are you a UC Davis faculty, staff, or student who...

## Complete this Medical or Training Requirement

		1. UC Lab Safety Fundamentals	2. Controlled Substances	3. LHAAT PPE Training	4. PPE – Dependent on what is used/worn	5. Enroll in Respiratory Protection Program	6. UC Shop Safety	7. Hearing Conservation	8. Hazard Communication	9. Heat Illness Prevention	10. Field Safety - Depending on Activity	11. See Biosafety webpage (link in Appendix)	12. Radioactive Materials Safety and/or Hydroprobe Safety	13. Laser Safety	14. Analytical and/or Diagnostic X-ray Producing Machine Safety	15. Medical History Questionnaire (MHQ) **	16. Animal Care and Use 101
Laboratory Safety	will use chemicals or work in a wet lab?	X															
	will have access to controlled substances?	X	X														
	will use/wear PPE?	X		X													
Industrial Safety	will use/wear specialty PPE?	X			X												
	will need respiratory protection?	*				X											
	will use shop equipment?	*					X										
	will encounter noise in workplace?	*						X									
	will work with hazardous materials in an industrial setting?	*							X								
Field Safety	will be working outdoors?									X							
	will be conducting field research?										X						
Biosafety	will work with any material that falls under Cal OSHA Bloodborne Pathogen Standard?	X										X					
	will work with recombinant DNA	X										X					
	will work with materials that are infectious or contain infectious agents (to plants, animals, or humans)?	X										X					
Radiation Safety	will handle radioactive materials?	X											X				
	will work with lasers?	*												X			
	will work with x-ray producing equipment?	*													X		
are ***	will handle animal carcasses, animal tissue or will have access to vivarium?	X														X	



# LMS Safety Training Classes and EH&S Safety Nets

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- | Research and Laboratory Safety
- | Workplace Violence Protection-new as of 9/2024
- | General and Equipment Safety
- | Ergonomics
- | Biological Safety – BUA



Dilbert.com DilbertCartoonist@gmail.com



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# Department Specific Safety Training

- Autoclave Safety training
  - For all using autoclaves in 3120 RMI North
  - Contact me to receive training materials
- Agricultural Field Safety training-must be renewed annually
  - Includes LMS training:
    - Greenhouse/Field Safety Training
    - CEF Safety training
    - Heat (indoor and outdoor) Illness prevention training
  - Field specific training documents (available in the lab)
  - Lab Specific Field Safety Plan





# Laboratory Chemical Use Check List

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- ☐ Check lab chemical inventory before ordering a chemical
- ☐ Add each new chemicals to chemical inventory with barcode tag (ChemTag)
- ☐ Read Safety Data Sheet (SDS)
- ☐ Add to the Standard Operating Procedure (SOP) or create a new SOP if needed
- ☐ Use proper personal protection (long pants, sleeved shirt, closed-toe shoes, eye protection, lab coat, proper gloves, etc.)
- ☐ \*Dispose of chemical waste in properly labeled and dated container

\*WASTe online system, SafetyNet 8



# Chemical Inventory System (Chemicals)

Inventory ▾


Keyword

Substructure




Search by cas #, name, formula, GHS or container barcode


Location

Tags ▾





**Camphene**  
CAS: 79-92-5  
Physical State: solid  
GHS: H228 , H313 , H319 , H400 , H410  
Containers: 1







**2-Methoxy-4-vinylphenol**  
CAS: 7766-61-0  
Physical State: liquid  
GHS: H315 , H319 , H335  
Containers: 1





**Ammonium phosphate monobasic**  
CAS: 7722-76-1  
Physical State: solid  
GHS: H315 , H319 , H335  
Containers: 1





**TWEEN 20**  
CAS: 9005-64-5  
Physical State: liquid (viscous liquid)  
GHS: H316  
Containers: 1

**2-Nonanone**



# SDS Information

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- | Identity of the chemical
- | Hazardous nature of chemical (H-codes)
- | Physical characteristic (e.g., boiling point)
- | Fire and explosion information
- | Reactivity data
- | Health hazard data (e.g., health effects, symptoms)
- | Personal protective equipment needed
- | How to handle leaks, spills and disposal
- | Special precautions

# SDS Information

## 1. PRODUCT AND COMPANY IDENTIFICATION

### 1.1 Product identifiers

Product name : Cycloheximide

Product Number : C7698

Brand : Sigma

Index-No. : 613-140-00-8

CAS-No. : 66-81-9

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

### 1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich  
3050 Spruce Street  
SAINT LOUIS MO 63103  
USA

Telephone : +1 800-325-5832

Fax : +1 800-325-5052

### 1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

#### GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, Oral (Category 2), H300

Germ cell mutagenicity (Category 2), H341

Reproductive toxicity (Category 1B), H360

Acute aquatic toxicity (Category 2), H401

Chronic aquatic toxicity (Category 2), H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

### 2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H300 Fatal if swallowed.

H341 Suspected of causing genetic defects.

H360 May damage fertility or the unborn child.

H411 Toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P264 Wash skin thoroughly after handling.

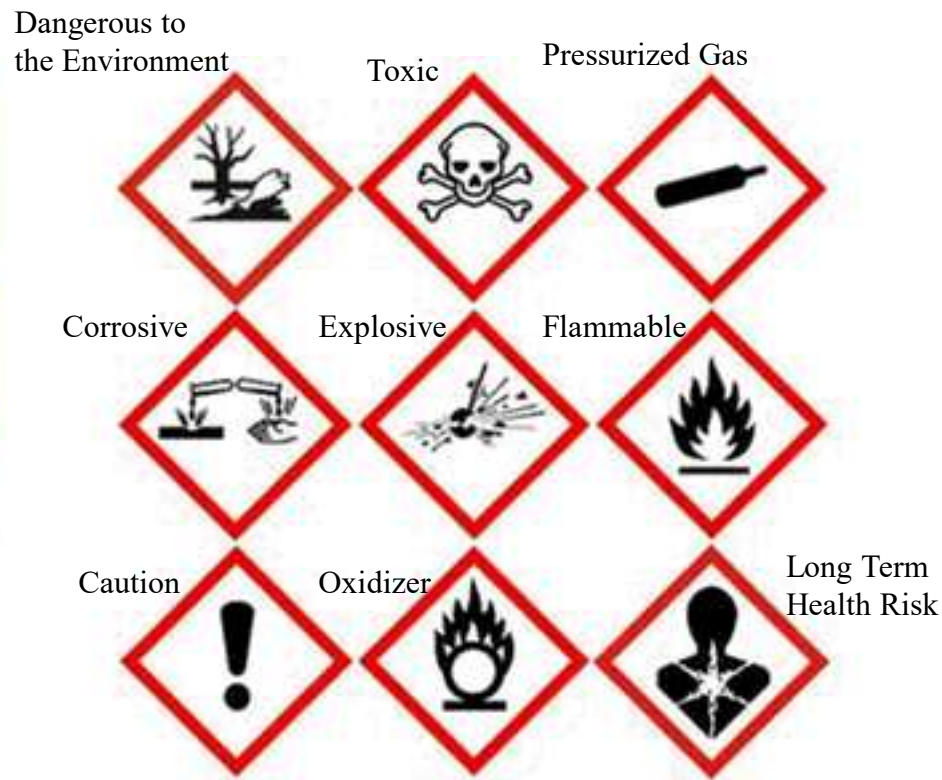
# ***The Globally Harmonized System of Classification and Labeling of Chemicals (GHS)***

- Signal word – either **DANGER** or **WARNING**
- Precautionary statement indicating product handling to minimize risks to the user
- H200 Physical Hazard
- H300 Health Hazard
- H400 Environmental Hazard
- The lower the number within the category the higher the hazard i.e. H300 is more hazardous than H304

# Hazard Symbols



Old Hazard Symbols



New Hazard Symbols





# Hazardous Material Control Systems

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- | Chemical Fume Hoods
- | Glove Boxes
- | Flammable Liquid Storage Cabinets
- | Biological Safety Cabinets
- | Chemical Spill Clean-up Kit
- | Other Engineering Controls

# Standard Operating Procedures

- Document the laboratory-specific procedures for the safe handling, storage and disposal of hazardous chemicals
  - Principal Investigators and laboratory supervisors are responsible for establishing SOPs relevant to health and safety for laboratory activities involving hazardous chemicals under their direction
- Cal/OSHA requires standard operating procedures (SOPs) be established for work with hazardous chemicals
  - Stated in the [8 CCR § 5191](#) (Occupational Exposure to Hazardous Chemicals in Laboratories, “Laboratory Standard”) under the provisions of the Chemical Hygiene Plan

# Elements of an SOP

- Establish a designated work and storage area
- Determine engineering controls, i.e. fume hood
- Determine proper personal protective equipment
- Establish procedures for waste removal
- Set up decontamination procedures

# Hazard Class SOP

- Acutely Toxic Chemicals
- Carcinogens
- Corrosives
- Cryogenics
- Flammable solids and liquids
- Reproductive Toxins
- Working alone
- Water reactives
- Potentially Explosive Compounds

Templates available on Safety Services website

# Personal Safety





# NO PANTS, NO SHOES NO SCIENCE



FOR MORE INFORMATION CONTACT ENVIRONMENTAL HEALTH AND SAFETY AT (806) 742-3876  
[WWW.EHS.TTU.EDU](http://WWW.EHS.TTU.EDU) | [WWW.SAFETY.TTU.EDU](http://WWW.SAFETY.TTU.EDU)

SAFETY@TTU

VITICULTURE & ENOLOGY  
UNIVERSITY OF CALIFORNIA DAVIS



# Personal Protective Equipment (PPE)

- Eye Protection
  - Safety Glasses, Safety Goggles, Face Shields
- Gloves
  - Nitrile, Chemical-handling, High-temp. Lo-temp.
- Other Protective Clothing
  - Lab Coats, Aprons, etc.
- Respiratory Protection
  - Dust and Mist Respirators
- Other
  - e.g., Hearing Protection



**NO PANTS  
NO SHOES**

**NO SCIENCE**

# PPE Etiquette

- Do not wear soiled or contaminated lab coats in shared spaces
  - Wear clean lab coats for use in autoclave rooms
- Transport items in clean secondary containers and do not use gloves in hallways.
  - If transporting large amounts of liquids (1 L or more) use a clean cart to transport items (still must be stored in clean secondary containers)
- If working in another lab, have another lab coat in that lab OR bring a clean lab coat with you
- Remove gloves before putting on or taking off lab coat.
- Change gloves immediately if any chemical or biohazard is spilled on them
  - Gloves have breakthrough time for certain chemicals and can have small holes unseen to the naked eye (1-5 out of 80 gloves can have “allowable” defects).
- Do not touch face, phones or any exposed body part or personal items with gloves
- Wash hands after removing lab coat

# Glove selection and breakthrough times

	Natural rubber	Neoprene	Butyl	PVC	Nitrile	Viton
Chemical						
Acetic acid	2	3	4	2	1	4
Formic acid	2	3	4	3	2	2
Hydrofluoric acid (up to 70%)	2	2	3	1	1	?
Nitric acid 70+%	?	1	2	?	1	4
Sulfuric acid 70+%	1	2	4	2	1	2
Benzene	1	1	1	1	1	3
Toluene	1	1	1	1	1	4
Xylene	1	1	1	1	1	4

Selection Key:

4	Excellent, breakthrough times generally greater than 8 hours.
3	Good, breakthrough times generally greater than 4 hours.
2	Fair, breakthrough times generally greater than 1 hour.
1	Not Recommended, breakthrough times generally less than 1 hour.
?	Not Tested or Information unknown. Use known tested glove type.



# Emergency Action Plan (EAP)

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The program must be in writing and include the following elements:

- Emergency escape procedures and emergency escape route assignments
- Procedures to account for all employees after an emergency evacuation
- The preferred means of reporting fires and other emergencies
- Names or regular job titles of persons or departments who can be contacted for further information or explanation of duties under the plan
- A system to notify employees of an emergency
- Procedures for employees who remain to complete critical operations before they evacuate
- Rescue and medical duties for those employees who are to perform them
- Training for all employees on the EAP
- The written plan must be kept in the workplace and available for employee review







# Emergency Action Plan

## Know the locations of:

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- | All exits for your workplace and the building
- | AED and Stop the Bleed Kits located in the main lobby of RMI North
- | Alarm pull boxes and fire extinguishers
- | Nearest phone
- | Safety showers and eyewashes
- | First-aid kits
- | Chemical spill kits



If you will need assistance during evacuation, please contact me in advance!

# New language added to EAP

- ***Responder Liaison Duties:***
- **Responder Liaison** can be the person in charge of the space where emergency is occurring (ex. Fire in an office space)
  - This person is likely most knowledgeable of type of emergency/evacuation
  - Is present during an emergency
  - This means everyone can potentially be a Responder Liaison, which means everyone must be trained and understand emergency procedures.
- Pulls alarm/starts evacuation and simultaneously calls 911
- Upon evacuation, grab Hi-Vis vests. One will be located in each lab/joint space (one in Advising, one in RMI North main lobby next to AED and STB) and await at evacuation site for emergency personnel

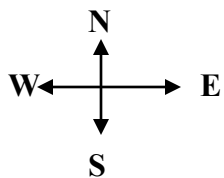
# Evacuation Plan - RMI South - 2nd Floor

-  Fire Extinguisher
-  Fire Alarm Box
-  Exit
-  You Are Here
-  Exit Hall
-  Exit Stairs

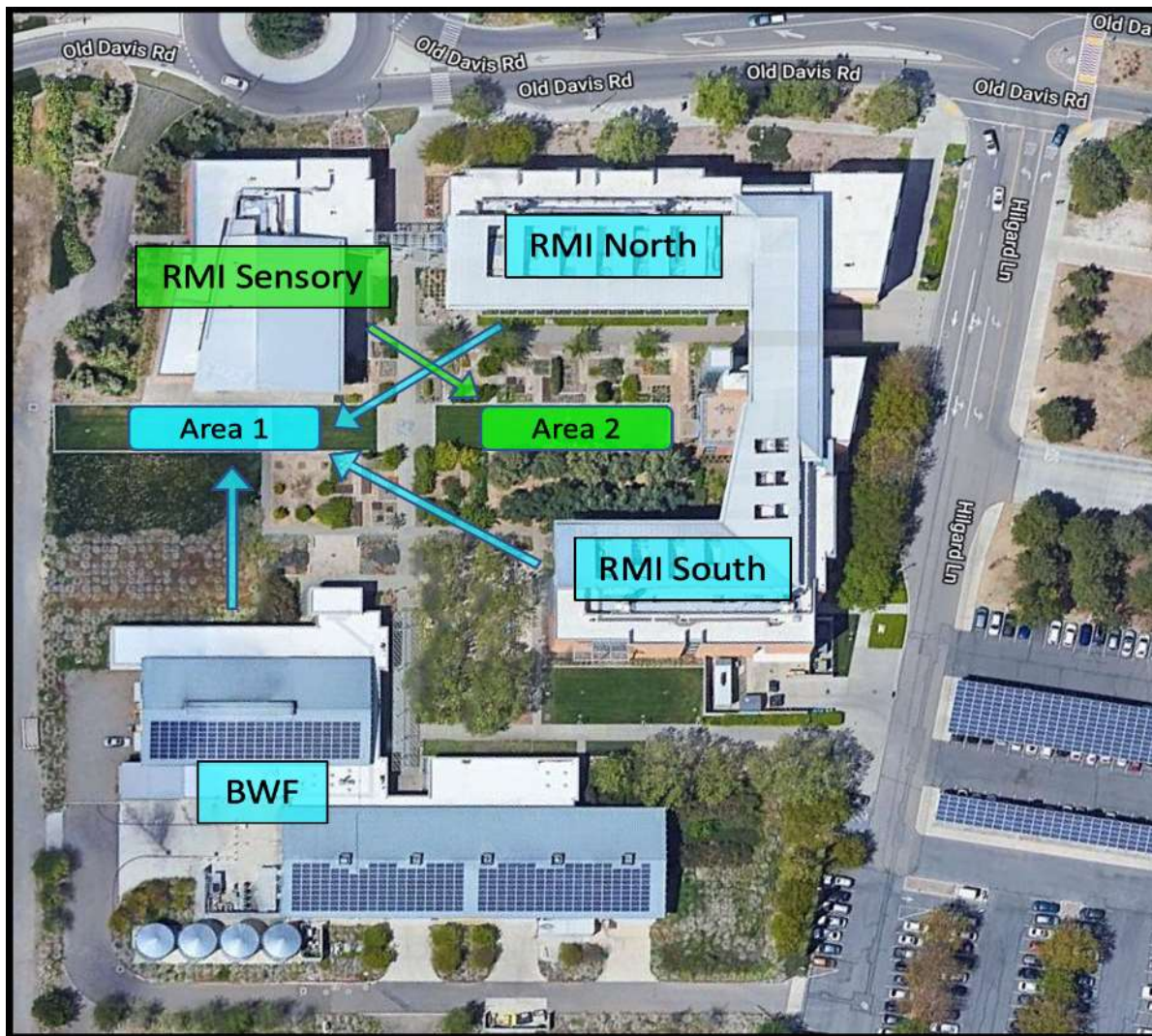
**Fire Alarm:**  
-Sound: Horns  
-Visual: Strobe







# EMERGENCY EVACUATION MAP



# Procedures in Case of Fire

- If fire is small you may attempt to neutralize the threat without endangering yourself
- If you are unsure - Leave the area, being sure others are out
- CLOSE THE DOOR!
- ACTIVATE THE NEAREST BUILDING FIRE ALARM
  - Once manual pull alarm is activated, alarm will emit audible and visual (strobing lights) signals to warn occupants of evacuation
- DIAL 911 (or 530-752-1230)
- STAY AWAY FROM AREA AND CLOSE ALL DOORS!
  - Doors in RMI complex are fire rated and will help prevent the spread of fire to surrounding areas
- Go to agreed meeting place
- Stand by to advise the emergency personnel when they arrive





# Fire extinguishers: Types and how to use

- 5 types
  - Class A: ordinary combustibles wood, paper, trash etc
  - Class B: flammable/combustible liquids
  - Class C: Electrical fires
  - Class D: special metals
  - Class K: Kitchen fires (oil, grease, etc.)
- All buildings in RMI equipped with combo extinguishers (A+B+C)
- Emit a powder that suffocates the fire
- Need to be checked monthly



# How to check fire extinguishers

- Need to be checked monthly
- Make sure needle is within the green range
  - Look at the needle as if you were looking at a meniscus of a liquid
- Put date and initials of person checking on the tag
- If there are issues, contact [fireprevention@ucdavis.edu](mailto:fireprevention@ucdavis.edu)



# How to use a fire extinguisher

## PASS

- **P**: pull the pin (note take care not to squeeze handle)
- **A**: aim at the base of the fire and stand back 5-6 ft
- **S**: squeeze the handle and move carefully closer as powder is being discharged
- **S**: sweep back and forth to cover the range of the fire
- **This should only be done when fire is at the beginning stage.** If flames are large, evacuate. 911 should already have been alerted
- Fire extinguisher will only last **20-30 seconds**



[Fire Extinguisher Training Video-  
OSHA](#)



# Procedures in Case of Earthquake

- | Get under a desk, table, archway, etc. during the shaking
- | Leave the building after the shaking is over
- | If outside during shaking, stay clear of buildings, trees, etc.
- | DIAL 911 (or 530-752-1230) to report any fires, ruptured pipes or downed electric lines
- | Assist injured persons in securing medical attention
- | Go to agreed meeting place
- | Stand by to advise emergency personnel when they arrive

# Active Shooter

- Immediate actions
  - Run
  - Hide
  - Fight
- Seek Help
  - Call 911 and provide as much information as possible:
    - Location, what is happening, description of suspect, your name and number
- Silence your phone:
  - If you cannot speak, turn the sound off with line open so police can hear what is going on
- <https://safetyservices.ucdavis.edu/units/emergency-preparedness/procedures/active-shooter>
- LMS: [Shots Fired](#)



# Campus Safety Tips

## Safety tips from UCD Police Department:

- Always be alert to your surroundings. This includes persons and vehicles.
- Report suspicious activity to UC Davis Police at **(530) 754-2677**.
- Do not allow strangers to enter behind you at secured facilities, residences halls and do not lend your entry keys.
- Report criminal activity (such as break-in, intruder, robbery, assault) immediately to 9-1-1
- Always lock your doors. Secure your property by locking doors to offices, laboratories, and buildings.
- At campus office facilities, report malfunctioning or broken doors and windows to Facilities call **(530) 752-1655**

## Department Safety Tips:

- Do not leave personal items or items of value in your vehicles and always lock your vehicle,
- Set up a communication system with other co-workers. If working late or alone, this can be used to alert of your safe arrival and departure from the building and in case of emergencies.
- Make sure all entry doors are closed and not propped open to prevent building break-ins and theft.
- Report any building malfunctions to [bftvfacilities@ucdavis.edu](mailto:bftvfacilities@ucdavis.edu)

# Campus Resources for Personal or Property Safety

## **UC Davis Campus Emergency Line: (530) 752-1230**

- For Police, Fire, or Medical emergencies
- If on a **cell phone** on campus, use this number, for landline, dial **911**

## **UC Davis Police Department 24 hour Non-Emergency: (530) 752-1727**

- Can be contacted to report suspicious behavior or for non-emergency situations
- Can be contacted if you are on Campus and feel unsafe

## **Safe Rides/UCD Police Department: (530) 754-2677**

- <https://police.ucdavis.edu/safe-rides>
- Hours of Operation:
  - 7 days a week, 5:00 p.m. to 10:00 p.m., on-campus to another on-campus location
  - 7 Days a week 10:00 p.m. to 6:00 a.m., on-campus location pick-up to any location in the city of Davis
  - VIP wheelchair transportation
    - 24/7 on campus to another on campus location
    - 7 Days a week, 10:00 p.m. to 6:00 a.m., on-campus location pick-up to any location in the city of Davis

# Emergency notification

## Campus emergency notification



### UCD WarnMe alerts

### Everbridge- personal safety mobile app



### TransLoc App

Requesting a SafeRide just got even easier! We've officially launched a **new app** called TransLoc!

# Contributors to accidents

- Rushing, Frustration, Fatigue, Complacency

## **Leads to Errors:**

- Eyes not on task
- Mind not on task
- Line-of-fire
- Balance/Traction/Grip

# CHEMICAL SPILL

The word "SPILL" is rendered in a large, bold, red font with a black outline. The letters are partially submerged in a dark grey, irregular puddle that represents a chemical spill. The letters 'S', 'P', 'I', 'L', and 'L' are all partially covered by the spill, with only the top portions visible. The word "CHEMICAL" is written in a smaller, red, blocky font above "SPILL".



# Procedures in Case of Chemical Spill

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- 1 pint or more or when in doubt, call UC Davis Fire Department (911)
- Evacuate the room, close the door, and wait for emergency personnel
- Flammable? Turn off all ignition sources before securing the room
- In case of chemical contact with skin or eyes, flood the affected area immediately with water; Seek medical assistance
- All contaminated clothing must be removed immediately
- Small spills (1 pint or less) may be cleaned up by laboratory personnel with a spill kit
  - Acids and bases should be absorbed and can be neutralized
  - Flammable liquids may be absorbed
  - DO NOT attempt to blot cryogenic liquid spills with unprotected hands, allow the liquid to evaporate
  - Solid spills are not usually emergencies. If the material spilled is toxic, use dampened cloths or paper towels to transfer it to plastic bags and disposed of as hazardous waste.
  - Report spills to EH&S (530) 752-1493





# Safety Shower and Eyewash Procedure

- If someone is contaminated with hazardous chemical
- Remove contaminated clothing if possible
- Rinse in emergency shower 15 minutes
- If eyes are involved, rinse eyes in the eye wash for 15 minutes holding eye(s) open
- Call 911 or (530)752-1230 or go to the hospital emergency room

# Chemical Incident Response – Decision Logic

Key Information



- Container label is legible
- MSDS available

- No injuries
- Low reactivity
- Low flammability
- Familiar quantity
- No fire
- Low volatility
- Not a strong oxidizer

- I feel comfortable enough, to deal with this situation.
- I am trained in proper protective equipment use.
- I am trained how to use spill control equipment.
- All the right equipment is available to me here and now.

Ask yourself

Do I know what this substance is?

NO

YES

Is this release small enough to manage myself?

NO

YES

Can this chemical be contained or isolated safely?

NO

YES

**Get Help!**  
**This is not a “Simple” Spill**

**Follow your campus emergency response procedures. This could involve:**

- Pull Alarm
- Evacuate
- Call 911
- Call your campus Environmental, Safety, or Facilities Management department

**This is a “Simple” spill**  
I can clean it up myself, within my normal workday.

# Spill Kit

## Guidelines for Chemical Spill Control SafetyNet #13: General Steps To Follow





# Steps for Clean Up



# Hands-on spill training

- Hoping to be offered at least once Fall and Spring Quarter
- Open to all interested who are working in labs

Spill materials had different effectiveness



Amphomag generated lots of dust and left residue



Green spill pillow essentially ineffective



Vermiculite very effective and easy to clean



Spill pads were extremely effective and easiest to use



Spill Magic™ also effective and easy to clean



Biohazard spill was great practice for those handling BSL-2

# Reporting a “Near Miss”





# Report a “Near Miss” to Safety Services

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- **Report an Incident or Concern**
- All faculty members, staff, students and visitors at UC Davis can participate in making the campus a safe place to work, study, and live by identifying health and/or safety hazards or unsafe conditions by informing those responsible for the problem area.
- **Employees are advised that use of this form or other reports of unsafe conditions or practices are protected by law. It would be illegal for the employer to take any action against an employee in reprisal for exercising rights to participate in communications involving safety.**



# Definition of Hazardous Waste

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## | Toxic

- Any substance which may be harmful to the environment or hazardous to your health if inhaled, ingested or absorbed through the skin.
- Includes acute toxins, carcinogens, other chronic toxins with bio-accumulative properties or persistence in environment

## | Reactive

- Substances that can produce toxic gases, are explosive, react violently with water, or contain cyanide or sulfide
- Includes explosives, oxidizers, reducers, water sensitive, acid sensitive, air sensitive and unstable chemicals

## | Flammable

- Flash point  $< 140^{\circ} \text{ F}$  ( $60^{\circ} \text{ C}$ )
- Capable of causing fire through friction, moisture or reactivity
- Includes oxidizers and flammable compressed gases

## | Corrosive

- $\text{pH} \leq 2$  or  $\text{pH} \geq 12.5$
- Corrosive to tissue or metals



# Guidelines for Disposal of Chemical Waste

- **SafetyNet #: 8**
- **WASTE** program required
  - All hazardous material and hazardous chemical waste must be picked up by Environmental Health and Safety (EH&S) or an EH&S-approved contractor.
- **Drain Disposal**
  - Drain disposal of non-hazardous materials is strictly regulated. See Safety Net #6 “Can This Go Down the Drain?” for more information on the Local Limits Program.



# Hazardous Waste Disposal

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- Reduce volume of source and minimize generation of waste
- Designate a lab location in which to store hazardous waste for disposal
- Use “Hazardous Waste” label supplied by WASTE
- Use screw-capped leak-proof container for liquids
- Keep bottled liquid waste in secondary container (e.g., lab tray)
- Segregate waste by hazard class (Stanford segregation guide)
- Arrange for pickup within 9 months\* of initial label date
  - \*90 days required for some hazardous chemicals\*
- Triple-rinse empty containers before disposal in trash
  - Some empty containers may require pick up by EH&S
- Dispose of syringes, glass pipettes and other sharps material in specially-designed rigid container

## Waste Accumulation Storage Tracking

**Waste Accumulation Storage Tracking electronically (WASTE)** facilitates the labeling, tracking, collection, and shipping of hazardous waste.

### My Notifications



You have no new notifications...

### Containers

Create a New Tag ▼

Chemical

Mixed

Radioactive

Universal

Biological

Exempt LSC vials

View My Tags ➔

[ehs.ucop.edu/waste](https://ehs.ucop.edu/waste)

[safetyservices.ucdavis.edu](https://safetyservices.ucdavis.edu)  
Search: Waste tracking

# STANFORD COMPATIBLE STORAGE GROUP GUIDE

Effective segregation in chemical storage reduces the risk of dangerous chemical reactions.

This guide must be used in conjunction with information from the manufacturer's safety data sheets and chemical-specific expert knowledge.

This storage group system is intended to be used in research settings to store laboratory-scale quantities of chemicals.

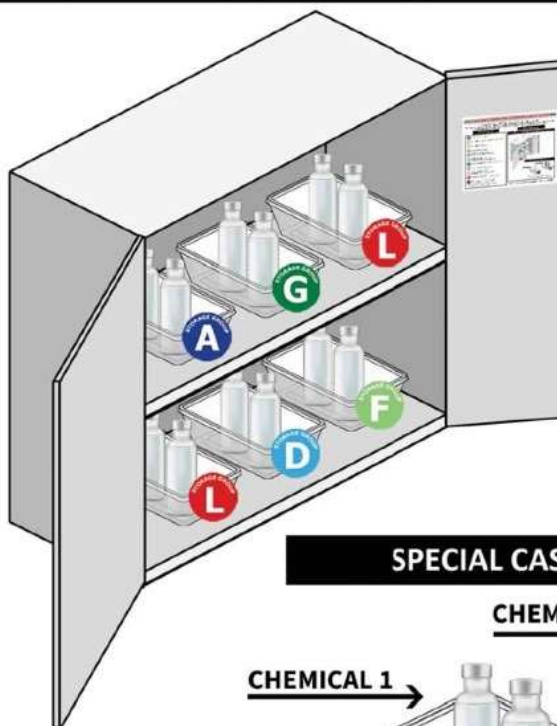
## What to Segregate

- A** Compatible Organic Bases
- B** Compatible Pyrophoric & Water-Reactive Materials\*
- C** Compatible Inorganic Bases
- D** Compatible Organic Acids
- E** Compatible Oxidizers & Peroxides (not including Strong, Oxidizing Acids)\*
- F** Compatible Inorganic Acids (not including Oxidizers or Combustibles)
- G** Not Intrinsically Reactive, Flammable, or Combustible
- I** Compatible Strong, Oxidizing Acids
- K** Compatible Stable Explosives (not including Oxidizing Explosives)\*
- L** Flammables, Combustibles, & Organic Solvents
- X** Incompatible with ALL Other Chemicals (including other chemicals within X)\*

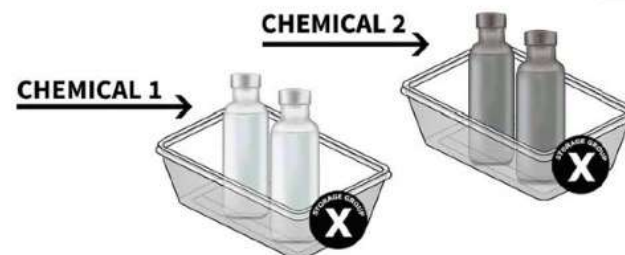
\* These materials are likely to require special handling & storage conditions. Use extreme caution.

## How to Segregate

USE SEPARATE SECONDARY CONTAINERS FOR EACH GROUP



SPECIAL CASE FOR GROUP X



NOTE: Different chemicals within Storage Group X must be segregated from each other.

Questions? Contact the EH&S Lab Safety Program at 723-0448  
Use ChemTracker to find a chemical's Storage Group - [stanford.chemtracker.org](http://stanford.chemtracker.org)





# Most Frequently Violated Safety Rules

- **Hazardous wastes** must be properly managed
- **Labeling** hazardous solutions
  - The full contents **spelled out in English not chemical formulas**
  - Initials of researcher and date of preparation
- Lab workers must wear protective clothing, minimum **closed-toe and heel shoes and long pants** or skirt
- Work with acids, bases, solvents, powders, pressure or vacuum requires **lab coat** or apron and **eye protection**
- Lab workers must be trained on all safety equipment and standard operating procedures (**SOP**)
- Labs must be “clean” and “**without clutter**” and **no food or drink** allowed



Vanessa Lieberman  
[vmmorales@ucdavis.edu](mailto:vmmorales@ucdavis.edu)