

UCDAVIS **HEALTH**

EDUCATION & RESEARCH

INJURY AND ILLNESS PREVENTION PROGRAM



Implementation Date: March 31, 2022

Annual Review Date*: 03/31/2022 SL _____

SCHOOLS OF HEALTH EDUCATION & RESEARCH

INJURY AND ILLNESS PREVENTION PROGRAM

This Injury and Illness Prevention Program has been prepared by the University of California, SCHOOLS OF HEALTH department(s) in accordance with:

UC Davis Policy & Procedure Manual Section 290-15: Safety Management Program) <http://manuals.ucdavis.edu/PPM/290/290-15.pdf>

And

California Code of Regulations Title 8, Section 3203 (8 CCR, Section 3203).
<https://www.dir.ca.gov/title8/3203.html>

SCHOOLS OF HEALTH EDUCATION & RESEARCH

INJURY AND ILLNESS PREVENTION PROGRAM

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I. Department Information

Department Name: BMM

Department Location(s): OPRB, Research 1 & 3, MIND, Tupper Hall, GBSF

Department Chairperson: Fernando Santana

Department CAO/MSO: Adriane Joo

Department Safety Officer(s):

Steve Libertini (Sacramento Campus) Telephone Number: 916-460-1259

Brett Smith (Davis Campus) Telephone Number: 530-752-9996

Buildings Occupied by Department(s)

1. UCD – DAVIS CAMPUS RESEARCH BUILDINGS:

- GENOME BUILDING AND SCIENCE FACILITY (GBSF)
- TUPPER HALL (MS1-A)
- SURGE I/III
- HICKEY GYM
- MED: NEUROSCIENCE
- CENTER FOR HEALTH & ENVIRONMENT (CHE)
- CENTER FOR COMPARATIVE MEDICINE (CCM)
- CALIFORNIA NATIONAL PRIMATE RESEARCH CENTER (CNPRC)

2. UCD – SACRAMENTO CAMPUS RESEARCH BUILDINGS:

- RESEARCH I
- RESEARCH II
- RESEARCH III
- M.I.N.D. INSTITUTE – WET LAB
- SHRINER'S HOSPITAL (6TH FLOOR)
- CANCER CENTER – IMAGING RESEARCH CENTER
- OAK PARK RESEARCH BUILDING (OPRB)
- INSTITUTE FOR REGENERATIVE CURES (IRC)
- FSSB – ANATOMY TEACHING LABORATORY
- SACRAMENTO COUNTY CORONERS – DONATED BODY PROGRAM
- VA HOSPITAL (MATHER)
- TICON I BUILDING
- EDUCATION BUILDING/CENTER FOR HEALTH AND TECHNOLOGY
- CLINICAL AND TRANSLATIONAL SCIENCE CENTER (CTSC)
- PATIENT SUPPORT SERVICE BUILDING (PSSB)
- ADMINISTRATIVE SUPPORT BUILDING
- CYPRESS BUILDING – SUITE D
- CANNERY BUSINESS PARK
- PATHOLOGY BUILDING
- GRANGE
- BEHAVIORAL HEALTH CENTER


II. Authorities and Responsible Parties

The authority and responsibility for the implementation and maintenance of the Injury and Illness Prevention Program (IIPP) is in accordance with University Policy (UCD Policy & Procedure Manual Section 290-15: Safety Management Program) and California Code of Regulations (8 CCR, Section 3203) and is held by the following individuals:

1. Name: **Anuurad Erdembileg**

Title: **SOM Assistant Dean for Research**

Authority: Authority and responsibility for ensuring implementation of this IIPP

Signature:  Date: 04/12/2022

Additionally, all Principal Investigators and supervisors are responsible for the implementation and enforcement of this IIPP in their areas of responsibility in accordance with University Policy (UCD Policy & Procedure Manual Section 290-15: Safety Management Program).

Department heads appoint the department/unit safety coordinator(s) to assist as described in UCD Policy & Procedure Manual Section 290-15: Safety Management Program.

1. Name: Kevin Phelps

Title: BMM Safety Coordinator for School of Medicine, Sacramento Campus
Cell Number: 916-612-8884

III. System of Communications

1. Effective communications with Research & Education employees have been established using the following methods:

- Standard Operating Procedures
 - Material Safety Data Sheets
 - Monthly Dept. Operations Meetings
 - Internal Media (Department Intranet)
 - EH&S Safety Nets
 - Training videos
 - Safety
 - Newsletter
 - Handouts
 - Building Evacuation
 - Plan E-mail
 - Posters and warning labels
 - Job Safety Analysis – Initial Hire
 - Job Safety Analysis – Annual
- Review Other (list):

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- [INITIAL “IN PERSON” RESEARCH & EDUCATION SAFETY ORIENTATION AND TRAINING.](#)
 - [ANNUAL REFRESHER RESEARCH & EDUCATION SPECIFIC SAFETY TRAINING.](#)
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2. Employees are encouraged to report any potential health and safety hazard that may exist in the workplace using the procedure outlined here: <https://safetyservices.ucdavis.edu/report-concern>. **Hazard Alert Forms (Appendix A)** are also available to employees for this purpose. Forms are to be placed in the Safety Coordinator’s departmental mail box. Employees have the option to remain anonymous when making a report.

3. Employees have been advised of adherence to safe work practices and the proper use of required personal protective equipment. Conformance will be reinforced by discipline for non-compliance in accordance with University policy UC Procedure 62 - Personnel Policies for Staff Members, Corrective Action - <http://policy.ucop.edu/doc/4010411/PPSM-62>

IV. System for Assuring Employee Compliance with Safe Work Practices

As stated in Section III, employees have been advised of adherence to safe work practices and the proper use of required personal protective equipment. Conformance will be reinforced by discipline for non-compliance in accordance with University policy UC Procedure 62 - Personnel Policies for Staff Members, Corrective Action - <http://policy.ucop.edu/doc/4010411/PPSM-62>

The following methods are used to reinforce conformance with this program:

1. Distribution of Policies
2. Training Programs
3. Safety Performance Evaluations

Performance evaluations at all levels must include an assessment of the individual's commitment to and performance of the accident prevention requirements of his/her position. The following are examples of factors considered when evaluating an employee's safety performance.

- a. Adherence to defined safety practices.
 - b. Use of provided safety equipment.
 - c. Reporting unsafe acts, conditions, and equipment.
 - d. Offering suggestions for solutions to safety problems.
 - e. Planning work to include checking safety of equipment and procedures before starting.
 - f. Early reporting of illness or injury that may arise as a result of the job.
 - g. Providing support to safety programs.
4. Statement of non-compliance will be placed in performance evaluations if employee neglects to follow proper safety procedures, and documented records are on file that clearly indicate training was provided for the specific topic, and that the employee understood the training and potential hazards.
 5. Corrective action for non-compliance will take place when documentation exists that proper training was provided, the employee understood the training, and the employee knowingly neglected to follow proper safety procedures. The four types of corrective action that can be used are written warning, corrective salary decrease, suspension and demotion.
 6. Additional Department Method(s) listed below:

V. Hazard Identification, Evaluation, and Inspection

Job Hazard Analyses and worksite inspections have been established to identify and evaluate occupational safety and health hazards.

1. Job Safety Analysis:

Job Safety Analysis (JSA) identifies and evaluates individual employee work functions, potential health or injury hazards, and specifies appropriate safe practices, personal protective equipment, and tools/equipment. JSA's have been completed for the following job categories:

- A. JSA ANIMAL HANDLERS
- B. JSA CLINICAL WORKERS
- C. JSA FIELD RESEARCHERS
- D. JSA RESEARCH LABORATORIES
- E. JSA OFFICE/COMPUTER WORKERS

The following resources are available for assistance in completing JSA's:

- Laboratory personnel, please refer to the [Laboratory Hazard Assessment Tool](#)
- Non-Laboratory personnel, please refer to the [JSA/PPE Certification Forms](#)

Template **Job Safety Analyses** are located in **Appendix B**. Please add additional work specific JSA if not included within the template. Completed Job Safety Analyses should be kept on file in the **PI or department-specific Safety Binder or in the online Laboratory Hazard Assessment Tool**.

2. Worksite Inspections

Worksite inspections are conducted to identify and evaluate potential hazards. Types of worksite inspections include both periodic scheduled worksite inspections as well as those required for accident investigations, injury and illness cases, and unusual occurrences. Inspections are conducted at the following worksites:

Location: **SCHOOLS OF HEALTH
EDUCATION & RESEARCH**

Frequency: **ANNUAL**

Responsible Person: **SCHOOLS OF HEALTH - DEPARTMENT
EDUCATION & RESEARCH**

Records Location: **SCHOOLS OF HEALTH – DEPARTMENT SAFETY BINDER
EDUCATION & RESEARCH or RISK AND SAFETY
SOLUTIONS ONLINE INSPECT TOOL**

Template **Worksite Inspection Forms** are located in **Appendix C1 (general office) and C2 (laboratory)**. Completed Worksite Inspection Forms are to be kept on file in the department's **IIPP Safety Binder** or as **part of the Risk and Safety Solutions Online Inspect Tool**.

VI. Accident Protocol, Reporting and Investigation

University Policy requires that work-related injuries and illnesses be reported to Workers' Compensation within 24 hours of occurrence and state regulation requires all accidents be investigated.

Schools of Health – Education & Research employees and volunteers will immediately notify their supervisor when occupationally-related injuries and illnesses occur, or when employees or volunteers first become aware of such problems.

UC Davis Paid Employees located on the Davis Campus are to seek medical treatment through UCD Occupational Health Services (530-752-6051) located in the Cowell Building (California Ave/ Regan Hall Cir) during business hours (8am-5pm). After hours, employees should seek medical treatment at Davis Urgent Care (4515 Fermi Place, 530-759-9110) *5pm-8pm weekdays, 8am-8pm weekends*. If Davis Urgent Care is closed, go to the Sutter Davis Hospital Emergency Room (530-757-5111). Further injury reporting procedure details can be found here:

<https://safetyservices.ucdavis.edu/units/risk-management-services/workers-compensation/injury-reporting>

UC Davis Paid Employees located on the UCDH Sacramento Campus are to seek medical treatment through the UCD Employee Health Services (916-734-3572) located in the Cypress Building (2221 Stockton Boulevard) during business hours (7am-3pm). After hours, employees should seek medical treatment at Mercy Medical Group Urgent Care (916-733-3377) *3pm-7pm weekdays, 8am-4pm weekends*. The UCDCM Emergency Room (916-734-3183) should be used for emergencies only.

Volunteers (including Visiting Researchers and Students not paid by UCD) are to seek medical treatment from their primary care physician. UCD students additionally may seek medical treatment at Student Health Services (530-752-2349) on La Rue Ave in Davis during business hours.

1. **Emergency Assistance:** If needing 9-1-1 assistance:
 - Call 9-1-1 dispatch and follow instruction given by 9-1-1 operator
 - Provide building and room location
 - Incident description (laceration, chest pains, chemical exposure, etc.)
2. **Supervisors** will investigate all accidents, injuries, occupational illnesses, and near-miss incidents to identify the causal factors or attendant hazards. Appropriate repairs or procedural changes will be implemented promptly to mitigate the hazards implicated in these events.
3. For any occupational related injury or illness, the [UCD Employer First Report \(EFR\)](http://safetyservices.ucdavis.edu/article/injury-reporting-procedure) must be completed online to record pertinent information and retain a copy to serve as documentation. This report can be completed by the employee's supervisor, lab manager, Department Safety Coordinator, or other individual familiar with the incident. <http://safetyservices.ucdavis.edu/article/injury-reporting-procedure>.
4. UCD paid employees must also complete the workers compensation claim form [DWC1](#) and scan and email to Workers Compensation at hs-workerscompergo@ou.ad3.ucdavis.edu.
5. **Note: For paid employees**, serious occupational injuries, illnesses, or exposures must be reported to Cal/OSHA by a UCD EH&S representative **within eight hours** after they have become known to the supervisor. These include injuries/illnesses/exposures that cause permanent disfigurement or require

hospitalization for a period in excess of 24 hours. Please refer to [EH&S SafetyNet #121](#) for OSHA notification instructions.

VII. Hazard Correction

Hazards discovered either as a result of a scheduled periodic inspection or during normal operations must be corrected by the supervisor in control of the work area, or by cooperation between the department in control of the work area and the supervisor of the employees working in that area. Supervisors of affected employees are expected to correct unsafe conditions as quickly as possible after discovery of a hazard, based on the severity of the hazard.

Specific procedures that can be used to correct hazards include, but are not limited to, the following:

- Tagging unsafe equipment “**Do Not Use Until Repaired,**” and providing a list of alternatives for employees to use until the equipment is repaired.
- Stopping unsafe work practices and providing retraining on proper procedures before work resumes.
- Reinforcing and explaining the need for proper personal protective equipment and ensuring its availability.
- Barricading areas that have chemical spills or other hazards and reporting the hazardous conditions to appropriate parties.

Supervisors should use the **Hazard Alert/Correction Report – Appendix E** to document corrective actions, including projected and actual completion dates.

If an imminent hazard exists, work in the area must cease, and the appropriate supervisor must be contacted immediately. If the hazard cannot be immediately corrected without endangering employees or property, all personnel need to leave the area except those qualified and necessary to correct the condition. These qualified individuals will be equipped with necessary safeguards before addressing the situation.

- Additional Department Procedure(s) listed below:

VIII. Health and Safety Training

Health and safety training, covering both general work practices and job-specific hazard training is the responsibility of the **PRINCIPAL INVESTIGATOR** and immediate Supervisor(s) as applicable to the following criteria:

1. Supervisors are provided with training to become familiar with the safety and health hazards to which employees under their immediate direction and control may be exposed.
2. All new employees receive training prior to engaging in responsibilities that pose potential hazard(s).
3. All employees given new job assignments receive training on the hazards of their new responsibilities prior to actually assuming those responsibilities.
4. Training is provided whenever new substances, processes, procedures or equipment (which represent a new hazard) are introduced to the workplace.
5. Whenever the employer is made aware of a new or previously unrecognized hazard, training is provided.

The **Safety Training Attendance Record** form is located in **Appendix E**.

IX. Recordkeeping and Documentation

Documents related to the IIPP may be maintained in any of the below locations:

- 1) **Laboratory Safety Binder** – Template(s) can be found on the Med: Sponsored Programs Website: <https://health.ucdavis.edu/medresearch/safety/>
- 2) **Department's IIPP Safety Binder**
- 3) [Risk and Safety Solutions Online Tool](#)

All Appendix forms below can be found at the Med: Sponsored Programs Website: <https://health.ucdavis.edu/medresearch/safety/>

- I. Hazard Alert/Correction Report (Appendix A form) – Retain for three (3) years.
- II. Employee Job Safety Analysis forms (Appendix B form) – Retain for the duration of each individual's employment.
- III. Worksite Inspection Forms (Appendix C form) – Retain for three (3) years.
- IV. Accident Investigation Forms (Appendix D form) – Retain for three (3) years.
- V. Employee Safety Training Attendance Records (Appendix E form) – Retain for three (3) years

X. Resources

1. University of California Policy on Management of Health, Safety and the Environment:
[Management of Health, Safety and the Environment](#)
2. UC Davis Policy and Procedure Manual, Safety Management Program:
<http://manuals.ucdavis.edu/PPM/290/290-15.pdf>
3. California Code of Regulations Title 8, Section 3203, Injury and Illness Prevention Program: <http://www.dir.ca.gov/title8/3203.html>
4. Personnel Policies for Staff Members, Corrective Action:
<http://policy.ucop.edu/doc/4010411/PPSM-62>
5. UC Davis Safety Services – Environmental Health & Safety
 - Programs & Services: <http://safetyervices.ucdavis.edu/>
 - Safety Nets: <https://safetyervices.ucdavis.edu/safetynet>
 - Safety Data Sheets (M)SDS: <http://hazard.com/msds/>
6. UC Davis Health System: <http://www.ucdmc.ucdavis.edu/welcome/index.html>
7. Mandatory annual training (Joint Commission – as part of Emergency Management):
<http://www.ucdmc.ucdavis.edu/hr/training/requirements.html>
 - Occupational Safety Unit:
<http://intranet.ucdmc.ucdavis.edu/safety/os/index.shtml>
 - Safety Bulletin Board Postings:
 - Cal/OSHA Poster-Health and Safety protection on the Job:
https://www.dir.ca.gov/dosh/dosh_publications/shpstrenq012000.pdf
 - Occupational Safety-Material Safety Data Sheets:
<http://intranet.ucdmc.ucdavis.edu/safety/os/msds.shtml>
 - Workers' Compensation Claim Line:
<http://intranet.ucdmc.ucdavis.edu/safety/os/pdfs/WkrsCompClaimLine.pdf>
 - Workers' Compensation-Notice Regarding Industrial Injury:
<http://www.dir.ca.gov/InjuredWorkerGuidebook/InjuredWorkerGuidebook.html>
8. UC Davis Fire Prevention Services:
Sacramento Campus: <https://health.ucdavis.edu/fire/>
Davis Campus: <https://safetyervices.ucdavis.edu/units/fire-prevention>

XI. Additional Department Resources

1. SafetyNet #129 - Safety Management Program Guidelines for Department Chairs
<https://safetyservices.ucdavis.edu/safetynet/safety-management-program-guidelines-for-department-chairs>
2. Occupational Health Services – UC Davis Campus:
<http://safetyservices.ucdavis.edu/ps/occh>
3. Occupational Health Services – UC Davis Sacramento Campus:
<http://www.ucdmc.ucdavis.edu/hr/hrdepts/ehs/>

Form(s): <http://www.ucdmc.ucdavis.edu/hr/hrdepts/forms/index.html>

EFFECTIVE: 2020	JOB SAFETY ANALYSIS IIPP-Appendix B	DEPARTMENT SCHOOLS OF HEALTH	LOCATION DAVIS & SACRAMENTO CAMPUS	JOB TYPE OFFICE & COMPUTER WORK
JOB FUNCTION	POTENTIAL HEALTH OR INJURY HAZARD(S)	RISK ASSESSMENT, SAFE WORK PRACTICES, PPE & ENGINEERING CONTROLS		
General office work.	<ol style="list-style-type: none"> 1. Back strain, eyestrain, repetitive motion injury. 2. Physical injuries due to slips, trips and falls, and falling objects. 3. Electrical hazards. 4. Physical injuries due to fires, earthquakes, bomb threats and workplace violence. 	<ol style="list-style-type: none"> 1. Ensure that workstations are ergonomically correct. Refer to EH&S SafetyNet #'s 17, 41, 46 and 96. Training and enforcement are under the direction of the Chief Administrative Officer. 2. Keep floors clear of debris and liquid spills. If a spill can't be cleaned immediately, use the "wet floor" sign to warn others of the potential hazard. Keep furniture boxes, etc. from blocking doorways, halls and walking space. Do not stand on chairs of any kind; use proper footstools or ladders. Do not store heavy objects overhead. Do not top-load filing cabinets, fill from bottom to top. Do not open more than one file drawer at a time. Brace tall bookcases and tall file cabinets to walls. Refer to EH&S SafetyNet # 46 and 83. Training and enforcement are under the direction of the Chief Administrative Officer. 3. Do not use extension cords in lieu of permanent wiring. Ensure that high wattage appliances do not overload circuits. Replace frayed or damaged electrical cords. Ensure that electrical cords are not wedged against furniture or pinched by doors. Refer to EH&S SafetyNet #'s 20 and 109. Training and enforcement are under the direction of the Chief Administrative Officer. 4. Attend emergency action and fire prevention plan training including emergency escape drills. Attend Workplace Violence training offered by UC Davis Police Department. Refer to https://safetyservices.ucdavis.edu/training/personal-workplace-safety. Training and enforcement are under the direction of the Chief Admin Officer. 		
Handling and moving heavy items and equipment.	Ergonomic hazards including heavy lifting, repetitive motions, awkward motions, crushing or pinching injuries, etc.	Get help with all loads that cannot be safely lifted by one person. Use mechanical means to lift and move heavy items, push carts and dolly rather than pull, employ proper lifting techniques at all times. Wear proper hand and foot protection to protect against crushing or pinching injuries. Refer to EH&S SafetyNet #'s 29, 41 and 46. Training and enforcement are under the direction of the Chief Admin Officer.		
Operation of motor vehicles	Motor vehicle accidents involving personal injury, or property damage.	All drivers of University vehicles must attend the Driver Safety Awareness Course offered by Fleet Services and possess a valid California driver's license. Hazardous materials may not be transported in personally owned vehicles.		
	DATE	SIGNATURE		

EFFECTIVE: 2020	JOB SAFETY ANALYSIS IIPP-Appendix B	DEPARTMENT SCHOOLS OF HEALTH	LOCATION DAVIS & SACRAMENTO CAMPUS	JOB TYPE CLINICAL LABS
JOB FUNCTION	POTENTIAL HEALTH OR INJURY HAZARD(S)	RISK ASSESSMENT, SAFE WORK PRACTICES, PPE AND ENGINEERING CONTROLS		
PATIENT LIFTING: Work with patients/human subjects may involve lifting and moving of patients.	Exposure to physical injury from lifting and moving of patients/human subjects.	Avoid unnecessary exposures. Use the lift team, when appropriate. Proper selection and use of equipment to minimize risk of injury. Proper adherence to lifting fundamentals. Participation in facility specific medical clearances may be required.		
INTERACTION WITH PATIENTS WITH AEROSOL TRANSMISSIBLE DISEASES: Work may involve interaction with patients/human subjects with aerosol transmissible diseases.	Exposure to patients/human subjects with aerosol transmissible diseases. Potential for contracting aerosol transmissible diseases via inhalation, contact, or ingestion.	Avoid exposures and minimize interaction time. Maximize interaction distance when feasible. Read the Material Safety Data Sheets (Biological MSDSs). Depending on the worker's potential for exposure, this may require participation in the aerosol transmissible disease program. Proper selection and use of personal protective equipment is required when entering isolation rooms. This may include respiratory protection, eye protection, layers of disposable gloves, disposable gowns and booties; read and follow the posted isolation room signs. Proper selection and use of personal protective equipment is vital when working with infectious patients. This should include respiratory protection, eye protection, and disposable gloves. Implementation of proper personal hygiene habits, including washing hands and face after leaving isolation rooms and removing personal protective equipment. Wash hands before eating.		
BLOODBORNE PATHOGENS AND BIOLOGICAL MATERIALS: Work with patients/human subjects may involve biological materials and wastes (including but not limited to infectious agents, recombinant agents, cell culture, stem cells, tissue culture, bloodborne pathogens, human tissues or fluids, toxins, body fluids, body parts and cadavers). All clinic workers are potentially exposed to these hazards.	Exposure to biological agents via inhalation, contact, ingestion or injection.	Avoid unnecessary exposures. Proper selection and use of personal protective equipment including gloves, protective eyewear, lab coats, and in some instances, respiratory protection. Adhere to bloodborne pathogen handling protocols. Implementation of proper personal hygiene habits, including washing hands and face before eating. Voluntary participation in Hepatitis B vaccination program. Adhere to proper biological waste handling procedures. All personnel are to attend EH&S Bloodborne Pathogen Program training. Participation in facility specific medical clearances may be required.		
HANDLING OF CRYOGENIC LIQUIDS	Exposure to cryogenic liquids	Avoid unnecessary exposures. Proper selection and use of tools and personal protective equipment including gloves, aprons and protective eyewear. Adhere to cryogenic procedures.		
	DATE	SIGNATURE		

EFFECTIVE: 2020	JOB SAFETY ANALYSIS IIPP-Appendix B	DEPARTMENT SCHOOLS OF HEALTH	LOCATION DAVIS & SACRAMENTO CAMPUS	JOB TYPE CLINICAL LABS
JOB FUNCTION	POTENTIAL HEALTH OR INJURY HAZARD(S)	RISK ASSESSMENT, SAFE WORK PRACTICES, PPE AND ENGINEERING CONTROLS		
TRANSPLANTS AND ANIMAL PARTS: Work in clinics may involve transplants organs, tissues and parts including animal parts.	Exposure to animals and animal allergies via inhalation and contact	Avoid unnecessary exposures. Proper selection and use of personal protective equipment including gloves, protective eyewear, lab coats, and in some instances respiratory protection. Proper adherence to protocols. Implementation of proper personal hygiene habits, including washing hands and face before eating. Participation in facilities- specific medical clearances as required.		
SELECT AGENTS: Work in laboratories containing select agents. Select agents in any quantity are registered with the Biosafety Officer. All lab workers who work in a lab with select agents and wastes are potentially exposed to these hazards during a fire or other emergency. Those workers who are registered as working with select agents are trained on safe procedures by the Biosafety Officer.	Exposure to select agents via inhalation, contact, ingestion or injection.	Avoid all exposures. Read the Material Safety Data Sheets (MSDSs). Design experiments for zero exposure. Proper selection and use of personal protective equipment including layers of disposable gloves, disposable lab wear and full-face respiratory protection. Implementation of proper personal hygiene habits, including washing hands and face before eating. All personnel to receive training from the Biosafety Officer.		
CHEMICALS: Work in clinical situations containing chemicals and chemical waste (including carcinogens). All workers who work in a clinic with chemicals and chemical waste are potentially exposed to these hazards.	Exposure to chemicals via inhalation, contact, ingestion or injection.	Avoid all unnecessary exposures. Read the Material Safety Data Sheets (MSDSs). Reduce exposures that cannot be avoided by minimizing exposure duration and concentration. Proper selection and use of personal protective equipment including gloves, protective eyewear, lab coats, and in some instances respiratory protection. Implementation of proper personal hygiene habits, including washing hands and face before eating. All personnel to receive training on Chemical Laboratory Safety, Hazardous Waste Management and Waste Minimization prior to conducting this type of work.		
BUSINESS PLAN: There is an inherent hazard in working in a building containing chemicals and workers are potentially exposed to these hazards.	Exposure to chemicals and associated hazards including explosion, fire, inhalation, contact, ingestion or injection.	Avoid all unnecessary exposures. Read the Material Safety Data Sheets (MSDSs) of materials that you work with and adhere to proper standard operating procedures. Reduce risk by notifying the Safety Officer of the hazards. Read and document training on the Building Fire Plan and the Building Evacuation Plan. Participate in building fire drills. No smoking permitted on campus.		
	DATE	SIGNATURE		

EFFECTIVE: 2020	JOB SAFETY ANALYSIS IIPP-Appendix B	DEPARTMENT SCHOOLS OF HEALTH	LOCATION DAVIS & SACRAMENTO CAMPUS	JOB TYPE CLINICAL LABS
JOB FUNCTION	POTENTIAL HEALTH OR INJURY HAZARD(S)	RISK ASSESSMENT, SAFE WORK PRACTICES, PPE AND ENGINEERING CONTROLS		
<p>CONTROLLED SUBSTANCES: Work in clinical situations handling controlled substances. All workers who work in a clinical situation with controlled substances are potentially exposed to these hazards.</p>	<p>Exposure to chemicals via inhalation, contact, ingestion or injection.</p>	<p>Avoid all unnecessary exposures. Reduce exposures that cannot be avoided by minimizing exposure duration and concentration. Proper selection and use of personal protective equipment including gloves, protective eyewear, lab coats, and in some instances respiratory protection. Implementation of proper personal hygiene habits, including washing hands and face before eating. All personnel to receive training on Chemical Laboratory Safety, Hazardous Waste Management and Waste Minimization prior to conducting this type of work.</p>		
<p>NUCLEAR MEDICINE AND RADIOACTIVE MATERIALS: Work in clinics containing radiological materials and wastes and work with patients who have been treated with and may contain radioactive materials. All workers are potentially exposed to these hazards. Those workers who conduct radioactive work have a higher potential for exposure and receive required training.</p>	<p>Exposure to radiological agents via inhalation, contact, ingestion or injection.</p>	<p>Avoid all unnecessary exposures. Adhere to radiological material handling procedures including limiting exposures through combination of minimizing time, maximizing distances and use of appropriate shielding. Proper selection and use of personal protective equipment including gloves, protective eyewear, lab coats, and in some instances respiratory protection. Implementation of proper personal hygiene habits, including washing hands and face before eating. Participation in radiological monitoring program may be required. All personnel to conduct radioactive work will receive on the job and classroom training including Radiation Safety and other applicable courses prior to conducting this type of work.</p>		
<p>NANOPARTICLES: Work in laboratories, shops and spaces containing chemicals in nanoparticle sizes.</p>	<p>Exposure to nanoparticle chemicals via inhalation, contact, ingestion or injection. The hazards of a nanoparticle are unclear. There is some evidence that the hazard of nanoparticles may be more reflective of particle and fiber hazards rather than of the chemical hazards.</p>	<p>Avoid all unnecessary exposures. Read the Material Safety Data Sheets (MSDSs). Adhere to proper standard operating procedures for these materials. Reduce exposures that cannot be avoided by minimizing exposure duration and concentration. Proper selection and use of personal protective equipment including gloves, protective eyewear, lab coats, and in some instances respiratory protection. Implementation of proper personal hygiene habits, including washing hands and face before eating.</p>		
<p>LASERS: Work in clinics containing laser hazards. All workers who work in a clinic with lasers are potentially exposed to these hazards.</p>	<p>Injury from physical hazards including high voltage, lasers and compressed gases and liquids, and specialized equipment.</p>	<p>Avoid unnecessary exposures. Proper selection and use of personal protective eyewear and specialized equipment. Employees are not to enter restricted areas unless accompanied by a properly trained individual familiar with the hazards of the area. Employees are not to operate specialized equipment without proper training and documentation. Personnel routinely entering areas where lasers are used will receive laser safety training prior to conducting this type of work.</p>		
	DATE	SIGNATURE		

EFFECTIVE: 2020	JOB SAFETY ANALYSIS IIPP-Appendix B	DEPARTMENT SCHOOLS OF HEALTH	LOCATION DAVIS & SACRAMENTO CAMPUS	JOB TYPE CLINICAL LABS
JOB FUNCTION	POTENTIAL HEALTH OR INJURY HAZARD(S)	RISK ASSESSMENT, SAFE WORK PRACTICES, PPE AND ENGINEERING CONTROLS		
<p>X-RAYS AND RADIATION PRODUCING MACHINES: Work in laboratories containing radiological machines. All lab workers who work in a lab with radiation producing equipment are potentially exposed to these hazards. Those workers who operate radioactive equipment and are added to the MUA have a higher potential for exposure and receive prescribed training.</p>	<p>Exposure to radiological agents via inhalation, contact, ingestion or injection.</p>	<p>Avoid all unnecessary exposures. Adhere to machine use procedures including limiting exposures through combination of minimizing time, maximizing distances and use of appropriate shielding. Proper selection and use of personal protective equipment including lead shielding, and lead aprons. Implementation of proper personal hygiene habits, including washing hands and face before eating. Participation in radiological monitoring program may be required. All personnel to operate radioactive equipment will receive on appropriate training as prescribed by the Radiation Safety Officer prior to conducting this type of work.</p>		
<p>HANDLING AND MOVING HEAVY ITEMS AND EQUIPMENT</p>	<p>Ergonomic hazards including heavy lifting, repetitive motions, awkward motions, crushing or pinching injuries etc.</p>	<p>Get help with all loads that cannot be safely lifted by one person. Use mechanical means to lift and move heavy items, push carts and dolly rather than pull, attend back safety class, employ proper lifting techniques at all times. Set up work operations as ergonomically safe as practical. Wear proper hand and foot protection to protect against crushing or pinching injuries.</p>		
<p>PHYSICAL HAZARDS: Work in clinics and spaces containing physical hazards</p>	<p>Injury from physical hazards including high voltage, lasers, ultraviolet light, compressed gases, liquids, cryogenic materials, and specialized equipment as well as falling objects.</p>	<p>Avoid unnecessary exposures. Proper selection and use of personal protective equipment including gloves, protective eyewear and specialized equipment. Employees are not to enter restricted areas unless accompanied by a properly trained individual familiar with the hazards of the area. Employees are not to operate specialized equipment without proper training and documentation. Watch for overhead hazards and wear head protection if needed. Personnel routinely entering areas where lasers are used will receive laser safety training prior to conducting this type of work.</p>		
<p>TRANSPORT: Transportation of samples, hazardous materials, radiological materials or wastes</p>	<p>Exposure to biological, chemical or radiological materials or waste during packaging and/or transport</p>	<p>All drivers of University vehicles must attend the Driver Safety Awareness Course offered by Fleet Services and possess a valid California drivers' license. Those who transport or prepare for transport in vehicles biological, chemical or radiological materials subject to DOT or IATA shipping requirements shall take the required Dangerous Goods Shipping Class. Hazardous materials may not be transported in personally owned vehicles. Transport of such materials between rooms and buildings shall be labeled and in double containment.</p>		
	DATE	SIGNATURE		

EFFECTIVE: 2020	JOB SAFETY ANALYSIS IIPP-Appendix B	DEPARTMENT SCHOOLS OF HEALTH	LOCATION DAVIS & SACRAMENTO CAMPUS	JOB TYPE RESEARCH LABS
JOB FUNCTION	POTENTIAL HEALTH OR INJURY HAZARD(S)	RISK ASSESSMENT, SAFE WORK PRACTICES, PPE & ENGINEERING CONTROLS		
<p>ANIMAL WORK: Work in laboratories, procedure rooms, surgery rooms and animal housing facilities containing animals. Refer to specific Animal Care Protocols. All lab workers who work in a lab conducting animal research are potentially exposed to these hazards. Those workers who are added to the ACPs have a higher potential for exposure and receive prescribed training.</p>	<p>Exposure to animals and animal allergies via inhalation and contact</p>	<p>Avoid unnecessary exposures. Proper selection and use of personnel protective equipment including gloves, protective eyewear, lab coats, and in some instances respiratory protection. Proper adherence to animal care and use protocols. Implementation of proper personnel hygiene habits, including washing hands and face before eating. Participation in the occupational health program for animal workers. All personnel to conduct animal research and be added to an Animal Use and Care Protocol shall attend the IACUC Animal Care and Use 101 training prior to conducting this work. Participation in other facility-specific medical clearances as required.</p>		
<p>BIOLOGICAL MATERIALS: Work in laboratories containing biological materials and wastes (including but not limited to infectious agents, recombinant work, cell culture, stem cell work, tissue culture, bloodborne pathogens, human tissues or fluids, stem cells, toxins and body parts). BUA: _____ All lab workers who work in a lab with biological materials and wastes are potentially exposed to these hazards. Those workers who are added to the BUA have a higher potential for exposure and receive prescribed training.</p>	<p>Exposure to biological agents via inhalation, contact, ingestion or injection.</p>	<p>Avoid unnecessary exposures. Proper selection and use of personnel protective equipment including gloves, protective eyewear, lab coats, and in some instances respiratory protection. Proper adherence to bloodborne pathogen handling protocols. Implementation of proper personnel hygiene habits, including washing hands and face before eating. Voluntary participation in Hepatitis B vaccination program. Proper adherence to biological waste handling procedures. All personnel to conduct biological work and added to the BUA shall attend a class on Laboratory Biological Safety/Bloodborne Pathogen Program prior to conducting this type of work. Participation in Facility specific medical clearances may be required.</p>		
	DATE	SIGNATURE		

EFFECTIVE: 2020	JOB SAFETY ANALYSIS IIPP-Appendix B	DEPARTMENT SCHOOLS OF HEALTH	LOCATION DAVIS & SACRAMENTO CAMPUS	JOB TYPE RESEARCH LABS
JOB FUNCTION	POTENTIAL HEALTH OR INJURY HAZARD(S)	RISK ASSESSMENT, SAFE WORK PRACTICES, PPE & ENGINEERING CONTROLS		
<p>BUSINESS PLAN: There is an inherent hazard in working in a building containing chemicals. Bldg/Title: _____ All lab workers who work in a building with chemicals and associated hazards are potentially exposed to these hazards.</p>	<p>Exposure to chemicals and associated hazards including explosion, fire, inhalation, contact, ingestion or injection.</p>	<p>Avoid all unnecessary exposures. Read the Material Safety Data Sheets (MSDS's) of materials that you work with. Reduce risk by notifying the Departmental Safety Coordinator and EH&S of hazards. Read and document training on the Building Fire Plan and the Building Evacuation Plan. Participate in building fire drills. No smoking is permitted on campus.</p>		
<p>CHEMICALS: Work in laboratories containing chemicals and chemical waste (including carcinogens). All lab workers who work in a lab with chemicals and chemical waste are potentially exposed to these hazards.</p>	<p>Exposure to chemicals via inhalation, contact, ingestion or injection.</p>	<p>Avoid all unnecessary exposures. Read the Material Safety Data Sheets (MSDS's). Reduce exposures that cannot be avoided by minimizing exposure duration and concentration. Proper selection and use of personnel protective equipment including gloves, protective eyewear, lab coats, and in some instances respiratory protection. Implementation of proper personnel hygiene habits, including washing hands and face before eating. All personnel to receive training on Chemical Laboratory Safety, Hazardous Waste Management and Waste Minimization prior to conducting this type of work.</p>		
<p>CONTROLLED SUBSTANCES: Work in laboratories and animal facilities handling controlled substances. CSA: _____ All lab workers who work in a lab with controlled substance authorization are potentially exposed to these hazards. Those workers who are added to the LUA have a higher potential for exposure and receive prescribed training.</p>	<p>Exposure to chemicals via inhalation, contact, ingestion or injection.</p>	<p>Avoid all unnecessary exposures. Reduce exposures that cannot be avoided by minimizing exposure duration and concentration. Proper selection and use of personnel protective equipment including gloves, protective eyewear, lab coats, and in some instances respiratory protection. Implementation of proper personnel hygiene habits, including washing hands and face before eating. All personnel to receive training on Chemical Laboratory Safety, Hazardous Waste Management and Waste Minimization prior to conducting this type of work.</p>		
<p>CRYOGENIC LIQUIDS:</p>	<p>Exposure to cryogenic liquids.</p>	<p>Avoid unnecessary exposures. Proper selection and use of tools and personnel protective equipment including gloves, aprons and protective eyewear. Proper adherence to cryogenic procedures.</p>		
	<p>DATE</p>	<p>SIGNATURE</p>		

EFFECTIVE: 2020	JOB SAFETY ANALYSIS IIPP-Appendix B	DEPARTMENT SCHOOLS OF HEALTH	LOCATION DAVIS & SACRAMENTO CAMPUS	JOB TYPE RESEARCH LABS
JOB FUNCTION	POTENTIAL HEALTH OR INJURY HAZARD(S)	RISK ASSESSMENT, SAFE WORK PRACTICES, PPE & ENGINEERING CONTROLS		
<p>Heavy Equipment: handling and moving heavy items and equipment.</p>	<p>Ergonomic hazards including heavy lifting, repetitive motions, awkward motions, crushing or pinching injuries etc.</p>	<p>Get help with all loads that cannot be safely lifted by one person. Use mechanical means to lift and move heavy items, push carts and dolly rather than pull, attend back safety class, employ proper lifting techniques at all times. Set up work operations as ergonomically safe as practical. Wear proper hand and foot protection to protect against crushing or pinching injuries.</p>		
<p>HUMAN SUBJECTS: work with human subjects. IRB PROTOCOLS: All workers who work with human subjects or around those people who do are potentially exposed to these hazards. Those workers who are added to the IRB Protocol have a higher potential for exposure and receive HIPAA Training and HIPAA Research training.</p>	<p>Exposure to chemical, radiological, biological (infectious) agents via inhalation, contact, ingestion or injection. Exposure to physical hazards.</p>	<p>Avoid unnecessary exposures. Proper selection and use of personnel protective equipment including gloves, protective eyewear, lab coats, and in some instances respiratory protection. Proper adherence to bloodborne pathogen handling protocols. Implementation of proper personnel hygiene habits, including washing hands and face before eating. Voluntary participation in Hepatitis B vaccination program. Proper adherence to biological waste handling procedures. All personnel to conduct biological work and added to the BUA shall attend a class on Laboratory Biological Safety/Bloodborne Pathogen Program prior to conducting this type of work. Participation in Facility specific medical clearances may be required.</p>		
<p>LASERS: Work in laboratories, shops and spaces containing laser hazards. LUA: _____ All lab workers who work in a lab with lasers are potentially exposed to these hazards. Those workers who are added to the LUA have a higher potential for exposure and receive prescribed training.</p>	<p>Injury from physical hazards including high voltage, lasers and compressed gases and liquids, and specialized equipment.</p>	<p>Avoid unnecessary exposures. Proper selection and use of personnel protective eyewear and specialized equipment. Employees are not to enter restricted areas unless accompanied by a properly trained individual familiar with the hazards of the area. Employees are not to operate specialized equipment without proper training and documentation. Personnel routinely entering areas where lasers are used will receive laser safety training prior to conducting this type of work.</p>		
<p>Motor vehicle operation: university vehicle(s)</p>	<p>Motor vehicle accidents involving personnel injury, or property damage.</p>	<p>All drivers of University vehicles must attend the Driver Safety Awareness Course offered by Fleet Services and possess a valid California driver's license. Hazardous materials may not be transported in personnel owned vehicles.</p>		
	<p>DATE</p>	<p>SIGNATURE</p>		

EFFECTIVE: 2020	JOB SAFETY ANALYSIS IIPP-Appendix B	DEPARTMENT SCHOOLS OF HEALTH	LOCATION DAVIS & SACRAMENTO CAMPUS	JOB TYPE RESEARCH LABS
JOB FUNCTION	POTENTIAL HEALTH OR INJURY HAZARD(S)	RISK ASSESSMENT, SAFE WORK PRACTICES, PPE & ENGINEERING CONTROLS		
<p>NANOPARTICLES: work in laboratories, shops and spaces containing chemicals in nanoparticle sizes.</p>	<p>Exposure to nanoparticle chemicals via inhalation, contact, ingestion or injection. The hazard of nanoparticles is unclear. There is some evidence that the hazard of nanoparticles may be more reflective of particle and fiber hazards than of the chemical hazards.</p>	<p>Avoid all unnecessary exposures. Read the Material Safety Data Sheets (MSDS's). Reduce exposures that cannot be avoided by minimizing exposure duration and concentration. Proper selection and use of personnel protective equipment including gloves, protective eyewear, lab coats, and in some instances respiratory protection. Implementation of proper personnel hygiene habits, including washing hands and face before eating.</p>		
<p>Physical Hazards: work in laboratories, shops and spaces containing physical hazards.</p>	<p>Injury from physical hazards including high voltage, lasers and ultraviolet light, compressed gases and liquids, cryogenic materials, and specialized equipment as well as falling objects.</p>	<p>Avoid unnecessary exposures. Proper selection and use of personnel protective equipment including gloves, protective eyewear and specialized equipment. Employees are not to enter restricted areas unless accompanied by a properly trained individual familiar with the hazards of the area. Employees are not to operate specialized equipment without proper training and documentation. Watch for overhead hazards and wear head protection if needed. Personnel routinely entering areas where lasers are used will receive laser safety training prior to conducting this type of work.</p>		
<p>RADIOACTIVE MATERIALS: work in laboratories containing radiological materials and wastes. RUA: _____ All lab workers who work in a lab with radiological materials and wastes are potentially exposed to these hazards. Those workers who conduct radioactive work and are added to the RUA have a higher potential for exposure and receive prescribed training.</p>	<p>Exposure to radiological agents via inhalation, contact, ingestion or injection.</p>	<p>Avoid all unnecessary exposures. Adhere to radiological material handling procedures including limiting exposures through combination of minimizing time, maximizing distances and use of appropriate shielding. Proper selection and use of personnel protective equipment including gloves, protective eyewear, lab coats, and in some instances respiratory protection. Implementation of proper personnel hygiene habits, including washing hands and face before eating. Participation in radiological monitoring program may be required. All personnel to conduct radioactive work will receive on the job and classroom training including Radiation Safety prior to conducting this type of work.</p>		
	DATE	SIGNATURE		

EFFECTIVE: 2020	JOB SAFETY ANALYSIS IIPP-Appendix B	DEPARTMENT SCHOOLS OF HEALTH	LOCATION DAVIS & SACRAMENTO CAMPUS	JOB TYPE RESEARCH LABS
JOB FUNCTION	POTENTIAL HEALTH OR INJURY HAZARD(S)	RISK ASSESSMENT, SAFE WORK PRACTICES, PPE & ENGINEERING CONTROLS		
<p>RADIATION PRODUCING MACHINES: work in laboratories containing radiological machines.</p> <p>MUA: _____</p> <p>All lab workers who work in a lab with radiation producing equipment are potentially exposed to these hazards. Those workers who operate radioactive equipment and are added to the MUA have a higher potential for exposure and receive prescribed training.</p>	<p>Exposure to radiological agents via inhalation, contact, ingestion or injection.</p>	<p>Avoid all unnecessary exposures. Adhere to machine use procedures including limiting exposures through combination of minimizing time, maximizing distances and use of appropriate shielding. Proper selection and use of personnel protective equipment including lead shielding, and lead aprons. Implementation of proper personnel hygiene habits, including washing hands and face before eating.</p> <p>Participation in radiological monitoring program may be required. All personnel to operate radioactive equipment will receive on appropriate training as prescribed by the Radiation Safety Officer prior to conducting this type of work.</p>		
<p>SELECT AGENTS: work in laboratories containing select agents. Select agents in any quantity are registered with the Biosafety Officer.</p> <p>Select Agent Quantities:</p> <ul style="list-style-type: none"> > Exempt quantities < Exempt quantities <p>All lab workers who work in a lab with select agents and wastes are potentially exposed to these hazards during a fire or other emergency. Those workers that are working with select agents are trained on safe procedures by the Biosafety Officer.</p>	<p>Exposure to select agents via inhalation, contact, ingestion or injection.</p>	<p>Avoid all exposures. Read the Material Safety Data Sheets (MSDS's). Design experiments for zero exposure. Proper selection and use of personnel protective equipment including layers of disposable gloves, disposable lab wear and full-face respiratory protection. Implementation of proper personnel hygiene habits, including washing hands and face before eating. All personnel to receive training from the Biosafety Officer.</p>		
	DATE	SIGNATURE		

EFFECTIVE: 2020	JOB SAFETY ANALYSIS IIPP-Appendix B	DEPARTMENT SCHOOLS OF HEALTH	LOCATION DAVIS & SACRAMENTO CAMPUS	JOB TYPE FIELD RESEARCH
JOB FUNCTION	POTENTIAL HEALTH OR INJURY HAZARD(S)	RISK ASSESSMENT, SAFE WORK PRACTICES, PPE & ENGINEERING CONTROLS		
Field Research	Exposure to sun/weather.	Wear sunscreen. Maintain adequate fluid intake. Wear protective clothing as needed (hat, raincoat, gloves, appropriate footwear). Take cover during a thunderstorm. Take breaks as needed in well-shaded areas when hot.		
	Access to field sites.	Drive defensively. Avoid driving when tired. Be prepared for delays. Carry adequate food, water, clothing, first aid equipment and tools.		
	Field Activities.	Wear appropriate footgear, especially when traveling through rough or rocky terrain. Obtain appropriate training on equipment use. Travel with another individual when accessing remote locations. Provide supervisor with itinerary prior to trip.		
	<p>Valley Fever: Valley fever is another name for the sometimes deadly infection coccidioidomycosis. It is called Valley Fever because the organism that causes it is commonly found in the soil of the southwestern United States, Mexico, and parts of Central and South America. Valley Fever usually affects the lungs. When it affects other parts of the body, it is called Disseminated Valley Fever. Valley Fever is spread through the air. If soil containing the Valley Fever fungus is disturbed by construction, natural disasters, or wind, the fungus spores get into the air. People can breathe in the spores and get Valley Fever. The disease is not spread from person to person. Anyone can get Valley Fever, but people who engage in activities that disturb the soil are at an increased risk. People with weakened immune systems are at increased risk for disseminated disease.</p>	Persons at risk for Valley Fever should avoid exposure to dust and dry soil in areas where Valley Fever is common.		
	DATE	SIGNATURE		

EFFECTIVE: 2020	JOB SAFETY ANALYSIS IIPP-Appendix B	DEPARTMENT SCHOOLS OF HEALTH	LOCATION DAVIS & SACRAMENTO CAMPUS	JOB TYPE ANIMAL HANDLER
JOB FUNCTION	POTENTIAL HEALTH OR INJURY HAZARD(S)	RISK ASSESSMENT, SAFE WORK PRACTICES, PPE AND ENGINEERING CONTROLS		
ANIMAL: handling and restraint:	<ul style="list-style-type: none"> • Mechanical/Physical Injuries from Animals. • Zoonotic Exposures: Zoonotic diseases are infections or infestations shared by humans and animals. Be aware that these diseases may also be transmitted via animal tissues (blood, neural tissue, etc.). • Zoonotic Exposure or Mechanical/Physical Injuries from Animals 	<ul style="list-style-type: none"> • Before beginning work, review the UCD Animal Use and Care website at: https://research.ucdavis.edu/policiescompliance/animal-care-use/iacuc/ • In the Occupational Health Surveillance System section, under Zoonotic Resources, obtain current information on “Zoonotic Diseases and Risk Analysis” for the species with which you will be working. Also review the information on “Allergy to Animals”. • Everyone who has exposure to animals must complete the “Health Surveillance Questionnaire”. Health care professionals at Occupational Health Services will review the form and make individual recommendations as appropriate. • Training for handling animals can be obtained from the Laboratory Animal Skills Class or from your supervisor. • Do not perform a procedure for which you have not been trained or feel uncomfortable. Ask your supervisor for assistance. • Always keep in mind that animals may bite, scratch or grab (in the case of primates). Maintain a safe distance from them when possible. • When working with species other than primates, the minimum protective clothing requirement is a lab coat, gloves, long pants and closed-toed shoes. • Based on a risk assessment, the laboratory or experimental conditions dictate any other requirements. For instance, if dust or fluid is generated (or if there is a potential for splash), wear a mask and eye protection. • When working with animals wear appropriate PPE. • Closed-toed shoes are to be worn in the lab where hazards are present. • When working with animals, long pants and a lab coat with cuffed sleeves (or “sleeves” with an uncuffed lab coat) will help protect against scratches. In some situations, you may be required to wear thick, protective leather gloves. See the Zoonotic Exposure section for more information. • Follow any Standard Operating Procedures (SOP) that your supervisor provides. (If you are working with primates, you may be required to watch a video such as, “Working Safely with Nonhuman Primates” or attend an animal handling training course. Prior to beginning work in a lab, discuss this with your supervisor.) • Immediately report any accident or injury to your supervisor and to Employee Health Services (752-6051). • No food or drink is allowed in the work place that contains hazardous materials of any kind. • Wash hands with an antibacterial soap before exiting animal and lab areas. • Training and enforcement are under the direction of the laboratory’s PI. 		
	DATE	SIGNATURE		

EFFECTIVE: 2020	JOB SAFETY ANALYSIS IIPP-Appendix B	DEPARTMENT SCHOOLS OF HEALTH	LOCATION DAVIS & SACRAMENTO CAMPUS	JOB TYPE ANIMAL HANDLER
JOB FUNCTION	POTENTIAL HEALTH OR INJURY HAZARD(S)	RISK ASSESSMENT, SAFE WORK PRACTICES, PPE AND ENGINEERING CONTROLS		
PRIMATE: handling and restraint	Nonhuman primates used in the research may be naturally infected with diseases that are transmissible to humans. Examples of natural diseases include enteric bacteria such as Campylobacter, Shigella, Yersinia, or Protozoa such as Giardia. Herpes B virus is endemic to macaques and potentially lethal to humans. Zoonotic exposures are possible from: Animal Exposures as described above, splashes of infectious material (blood, urine, feces) to mucous membranes (open wounds, nose, eyes, or mouth); improper personal hygiene (handwashing); aerosolization of infectious material; contact with contaminated fomites (inanimate objects, like an animal cage, which may be contaminated with disease- producing agents).	<ul style="list-style-type: none"> • Prior to entering lab corridor, check arms and wrists for cuts and scrapes. Cover cuts and scrapes with a band aid and double glove. • Wear appropriate protective clothing. Cover all bare skin: wear long pants, a lab coat with cuffs or coveralls with wrist cuffs or long-sleeved scrubs shirt with cuffs or any other long-sleeved protection that has a cuff and completely covers the arm and wrist, closed-toed shoes, latex or other similarly protective gloves, splash proof goggles (corrective eyeglasses alone are not acceptable, neither are shop goggles) or a full face shield, and a disposable face mask. Wear two pair of gloves when there is a high risk of exposure. If there is a potential for flying debris, impact resistant spectacles must be worn; having eye protection with the rating "Z8.7" stamped on it ensures that it will provide adequate protection as long as the eyewear is worn properly. When airborne droplets are a hazard, such as when a chair or cage is being cleaned with a hose, hair covering is required. When working with other species, protective clothing to be worn will depend on the situation; wear gear that minimizes exposure to any animal body fluids or tissues (splashes, etc.). • The individual who is working directly with a monkey is responsible for assuring that no other individual comes within 5 feet of that monkey (or 15 feet if the individual is a visitor) without protective clothing. If a monkey is being transported down the hallway in a chair, the person wheeling the monkey must visually check the hall for any other persons not wearing protective clothing. The person wheeling the monkey must issue a verbal warning so that a safe distance is maintained until the monkey has passed through. • After returning a monkey to its cage, make sure that the primate cage padlock is in its proper place and is locked. • IN THE EVENT OF A PRIMATE-RELATED INJURY OR POSSIBLE ZONOTIC EXPOSURE, IMMEDIATELY FOLLOW THE INSTRUCTIONS ON THE WOUND TREATMENT PROTOCOL FOR PRIMATE-RELATED INJURIES. • View the video "Working Safely with Nonhuman Primates", the UCD Animal Care and Use website, and follow all Standard Operating Procedures as required by your Principal Investigator (PI). 		
	DATE	SIGNATURE		

WORKSITE INSPECTION FORM

General Office Environment

Location: _____ Date: _____

Inspector: _____ Phone: _____

Department: _____

Administration and Training

Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	1.	Are all safety records maintained in a centralized file for easy access? Are they current?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	2.	Have all employees attended Injury & Illness Prevention Program training? If not, what percentage has attended? _____
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	3.	Does the department have a completed Emergency Action Plan? Are employees being trained on its contents?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	4.	Are chemical products used in the office being purchased in small quantities? Are Material Safety Data Sheets needed?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	5.	Are the Cal/OSHA information poster, Workers' Compensation bulletin, annual accident summary posted?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	6.	Are annual workplace inspections performed and documented?

General Safety

Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	7.	Are exits, fire alarms, pullboxes clearly marked and unobstructed?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	8.	Are aisles and corridors unobstructed to allow unimpeded evacuations?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	9.	Is a clearly identified, unobstructed, charged, currently inspected and tagged, wall-mounted fire extinguisher available as required by the Fire Department?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	10.	Are ergonomic issues being addressed for employees using computers or at risk of repetitive motion injuries?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	11.	Is a fully stocked first-aid kit available? Is the location known to all employees in the area?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	12.	Are cabinets, shelves, and furniture over five feet tall secured to prevent toppling during earthquakes?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	13.	Are books and heavy items and equipment stored on low shelves and secured to prevent them from falling on people during earthquakes?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	14.	Is the office kept clean of trash and recyclables promptly removed?

Electrical Safety

Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	15.	Are plugs, cords, electrical panels, and receptacles in good condition? No exposed conductors or broken insulation?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	16.	Are circuit breaker panels accessible and labeled?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	17.	Are surge protectors being used? If so, they must be equipped with an automatic circuit breaker, have cords no longer than 15 feet in length, and be plugged directly into a wall outlet.
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	18.	Is lighting adequate throughout the work environment?
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	19.	Are extension cords being used correctly? They must not run through walls, doors, ceiling, or present a trip hazard.
Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	20.	Are portable electric heaters being used? If so, they must be UL listed, plugged directly into a wall outlet, and located away from combustible materials.

LABORATORY SAFETY REVIEW CHECKLIST

ENVIRONMENTAL HEALTH & SAFETY
ONE SHIELDS AVENUE
DAVIS, CA 95616
(530) 752-1493



To fill out this checklist online from a tablet or phone, please use the [SIT tool](#) on UC Safety Suite.

Principal Investigator/Laboratory Supervisor: _____

Lab Contact: _____

Building: _____

Date: _____

Room Number: _____

Chemical	Yes	No	Corrected	NA
<p>Abbreviations used on container labels are identified in a prominent place in the lab.</p> <p>Description/Corrective Action: Abbreviations and/or acronyms used in the laboratory shall be posted in a prominent place and available to all laboratory workers</p>				
<p>Chemical containers are clearly labeled with contents (in English) and primary hazard(s).</p> <p>Description/Corrective Action: Each container of hazardous substance is to be labeled with the identity of the hazardous substance and any appropriate hazard warnings.</p>				
<p>Chemical storage containers are in good condition and appropriate for contents.</p> <p>Description/Corrective Action: Hazardous substances shall be stored in containers which are chemically inert to and appropriate for the type and quantity of hazardous substance. Containers of hazardous substances shall not be stored in such locations or manner as to result in physical damage to, or deterioration of, the container.</p>				
<p>Containers of hazardous chemicals are not stored on the floor.</p> <p>Description/Corrective Action: Floor storage is not recommended for hazardous materials. If it is necessary to do so, secondary containment is required.</p>				
<p>Corrosive or potentially hazardous liquid chemicals are stored below eye level.</p> <p>Description/Corrective Action: To reduce potential for spill or splash injury to face and eyes, corrosives and other potentially hazardous liquids should be stored below eye level (< 56”).</p>				
<p>Flammable chemicals are stored separately from combustible materials.</p> <p>Description/Corrective Action: Storage of flammable liquids shall be separated from incompatible materials, including combustible materials.</p>				
<p>Flammable liquid (including waste) storage outside of the flammable storage cabinet is less than 10 gallons.</p> <p>Description/Corrective Action: The maximum amount of flammable liquids (including waste) in a laboratory allowed outside a flammable storage cabinet is 10 gallons. If no flammable storage available, reduce inventory to less than 10 gallons.</p>				
<p>Flammable liquid storage in the lab is below allowable quantities as determined by the campus Fire Marshal (60 gallons per fire-rated area).</p> <p>Description/Corrective Action: Flammable liquids in the laboratory must not exceed 60 gallons per fire rated area.</p>				

LABORATORY SAFETY REVIEW CHECKLIST

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DAVIS, CA 95616
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<p>Flammables liquids are not stored in containers that exceed 1 gallon containers (or 2 gallons for approved safety can).</p> <p>Description/Corrective Action: Flammable liquid storage containers must not exceed 1 gallon, with the exception of 2 gallon if container is a safety can.</p>				
<p>Flammables liquids are not used in close proximity to ignition sources.</p> <p>Description/Corrective Action: Flammable liquids shall be kept as far as possible from open flames, but not less than 12 inches.</p>				
<p>Flammables are stored in "laboratory safe" refrigerator/freezer only.</p> <p>Description/Corrective Action: Flammables must be stored in refrigerators or freezers manufactured to be "laboratory safe" and properly labeled as safe for storage of flammables.</p>				
<p>Incompatible chemicals are properly segregated.</p> <p>Description/Corrective Action: Incompatible substances must be separated from each other by distance, partitions or secondary containment to prevent accidental contact. Store acids from bases, oxidizers from flammables, etc.</p>				
<p>Laboratory is free of expired or unneeded chemicals.</p> <p>Description/Corrective Action: Expired chemicals should be discarded following appropriate disposal procedures. All unneeded chemicals should be removed from the laboratory.</p>				
<p>Pyrophoric chemicals are segregated, properly contained, labeled and used only in buildings equipped with automatic sprinkler system.</p> <p>Description/Corrective Action: Pyrophoric chemicals must be segregated from incompatible materials by a distance of not less than 20 feet or by storing in hazardous material storage cabinets. Pyrophoric chemical use and storage is permissible only in buildings that are equipped throughout with an approved automatic sprinkler system.</p>				
<p>Storage cabinets are clearly labeled as to contents.</p> <p>Description/Corrective Action: Chemical storage cabinets must be conspicuously labeled as appropriate, i.e. "FLAMMABLE "or "CORROSIVES".</p>				
<p>Strong acids and strong bases are stored in secondary containers.</p> <p>Description/Corrective Action: Secondary containment is required for the indoor storage of all corrosives.</p>				
<p>Time sensitive chemicals/peroxide formers are labeled with date received, stored away from light and disposed of within 18 months of purchase or expiration date, whichever is sooner.</p> <p>Description/Corrective Action: Peroxide formers are to be stored away from light and heat and labeled with the date they were received, opened and an expiration date to facilitate hazard control. Organic peroxides can decompose into various unstable compounds over time.</p>				

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<p>Water reactive chemicals are properly segregated, contained and labeled.</p> <p>Description/Corrective Action: Materials which will react with water shall not be stored in the same room with flammable or combustible liquids. Chemicals that may react violently with water must be stored in a moisture free environment and protected from accidental contact with water.</p>				
Documentation	Yes	No	Corrected	NA
<p>Appropriate hazard communication signage is posted at laboratory entrance(s).</p> <p>Description/Corrective Action: Hazard identification signs (biohazard, radiation, carcinogen, toxic, oxidizer, flammable, pyrophoric, water reactive, corrosive, magnetic fields, laser, etc.) are required at the entrances to locations where hazardous materials are stored, dispensed, used or handled.</p>				
<p>Building Emergency Evacuation Route is posted near the exit.</p> <p>Description/Corrective Action: Map of escape route shall be posted near exits.</p>				
<p>Chemical inventory has been completed or updated within past 12 months.</p> <p>Description/Corrective Action: An inventory of all hazardous substances known to be present in the workplace must be maintained and updated at least annually.</p>				
<p>Current emergency contacts and PI/supervisor contact are posted at the laboratory entrance.</p> <p>Description/Corrective Action: The names or regular job titles of persons who can be contacted for further information or explanations during an emergency should be posted at the entrances to all laboratories.</p>				
<p>Department Injury and Illness Prevention Plan is available and up-to-date.</p> <p>Description/Corrective Action: Every employer shall establish, implement and maintain an effective Injury and Illness Prevention Program. The program shall be in writing and updated at least annually.</p>				
<p>Emergency Action Plan is available.</p> <p>Description/Corrective Action: Every employer shall establish, implement and maintain an Emergency Action Plan. The plan shall be in writing and updated at least annually.</p>				
<p>Emergency assistance information is posted.</p> <p>Description/Corrective Action: Effective provisions shall be made in advance for prompt medical treatment in the event of serious injury or illness. This can be accomplished by a communications system for contacting a doctor or emergency medical service, such as access to 911 or equivalent telephone system. Emergency numbers must be posted near telephone.</p>				
<p>Hazard assessment is completed and reviewed annually.</p> <p>Description/Corrective Action: UCOP policy requires a hazard assessment to determine the appropriate personal protective equipment. Any completed hazard assessment that indicates less than the minimum PPE described requires review and approval from EH&S. Hazard assessment must be reviewed on an annual basis and roster must be kept up-to-date.</p>				

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<p>If applicable, participation in the Medical Surveillance Program has been established and documented.</p> <p>Description/Corrective Action: For a Cal/OSHA regulated substance for which there are exposure monitoring and medical surveillance requirements, medical surveillance shall be established for employee as prescribed by the particular standard.</p>				
<p>Personnel is aware of location/existence of current campus-wide Chemical Hygiene Plan</p> <p>Description/Corrective Action: A written Chemical Hygiene Plan is required for any workplace that uses hazardous chemicals. Access to current Chemical Hygiene Plan must be available to all members of the lab. UC Davis campus-wide Chemical Hygiene Plan is contained within the Laboratory Safety Manual: http://safetyservices.ucdavis.edu/article/laboratory-safety-manual.</p>				
<p>Safety Data Sheets are accessible and available.</p> <p>Description/Corrective Action: Safety data sheets for each hazardous substance must be readily accessible. Electronic access and other alternatives to maintaining paper copies are permitted provided all lab workers have immediate access.</p>				
<p>Self-inspections are conducted and documented on an annual basis.</p> <p>Description/Corrective Action: Records of scheduled and periodic inspections (annual) to identify unsafe conditions and work practices, including person(s) conducting the inspection, the unsafe conditions and work practices that have been identified and action taken to correct the identified unsafe conditions and work practices are required.</p>				
<p>Staff is aware of how to report incidents and near-misses.</p> <p>Description/Corrective Action: Staff should be provided information on the reporting of incidents and near misses.</p>				
<p>Standard Operating Procedures are available.</p> <p>Description/Corrective Action: Written SOPs for hazardous operations in the laboratory, work with particularly hazardous substances, etc., and documented training are required. Consult manufacturers' Safety Data Sheets (SDS) for hazard classification information.</p>				
<p>Electrical</p>	<p>Yes</p>	<p>No</p>	<p>Corrected</p>	<p>NA</p>
<p>3-Prong plugs have not been modified to plug into 2-prong receptacle.</p> <p>Description/Corrective Action: Equipment must be properly grounded to operate safely.</p>				
<p>A minimum clearance of thirty-six inches in front of electric panel/breaker box is being maintained.</p> <p>Description/Corrective Action: A minimum clearance must be maintained around electrical panel for easy access in the event of an emergency.</p>				
<p>Electrical cords do not pose any trip hazards.</p> <p>Description/Corrective Action: Cords must be taped down or otherwise secured to prevent tripping.</p>				

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<p>Equipment does not have any damaged cord, plug or other condition that constitutes an electrical hazard.</p> <p>Description/Corrective Action: Remove equipment from service until repaired or replaced.</p>				
<p>Extension cords are not being used as permanent or semi-permanent wiring.</p> <p>Description/Corrective Action: Extension cords may be used in temporary situations where permanent wiring is inappropriate or because equipment is frequently moved. If permanent wiring is required a circuit receptacle should be installed.</p>				
<p>Extension cords or power strip are plugged directly into outlet.</p> <p>Description/Corrective Action: Power strips or extension cords must be directly connected to a permanently installed circuit receptacle, not connected in series.</p>				
<p>High voltage equipment is clearly and appropriately labeled.</p> <p>Description/Corrective Action: "Danger – High Voltage" must be posted on all doors that lead to areas that contain equipment with high voltage (>600 volts). Equipment must be marked as high voltage with permanent, highly visible markings.</p>				
<p>High voltage equipment is properly guarded.</p> <p>Description/Corrective Action: High voltage conductors (>600 volts) must be effectively guarded against danger from accidental contact. All protective panels must be properly installed.</p>				
<p>Major appliances/equipment are plugged directly into outlet.</p> <p>Description/Corrective Action: Refrigerators, freezers, incubators, centrifuges, microwaves, analytical equipment, etc. must be plugged directly into the wall outlet.</p>				
<p>Personnel working on hard-wired equipment are trained to the Energy Isolation – Lock Out/Tag Out program.</p> <p>Description/Corrective Action: The employer's hazardous energy control procedure shall include separate procedural steps for the safe lockout/tagout of each machine or piece of equipment affected by the hazardous energy control procedure. Only trained individuals may work on hard-wired equipment.</p>				
<p>Power strips near liquids have surge protection.</p> <p>Description/Corrective Action: Surge protection is required for all power strips that are used near liquid.</p>				
Equipment	Yes	No	Corrected	NA
<p>Appropriate safety information is posted on equipment.</p> <p>Description/Corrective Action: Required safety information, including danger and hazard warning must be posted on equipment.</p>				

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<p>Moving parts of equipment are properly guarded.</p> <p>Description/Corrective Action: Belts, pulleys, sprockets and chains, shafts or other rotating parts of mechanical equipment must be properly guarded (opening <math><1/2''</math>).</p>				
<p>Secondary containment for vacuum pumps that use oil is provided.</p> <p>Description/Corrective Action: Secondary containment must be provided for vacuum pumps to collect oil leakage.</p>				
Fire	Yes	No	Corrected	NA
<p>Aisles, exits and/or hallways are not obstructed.</p> <p>Description/Corrective Action: Aisles must meet minimum clearance guideline of 24" to facilitate departure in the event of an emergency.</p>				
<p>Fire Extinguisher is available in the room with flammable or combustible liquids.</p> <p>Description/Corrective Action: A portable fire extinguisher must be located in the area where flammable or combustible liquids are stored, used or dispensed.</p>				
<p>Fire extinguisher annual maintenance tag is present and up-to-date.</p> <p>Description/Corrective Action: Fire extinguisher must be inspected annually by Fire Prevention and documented on inspection tag. Contact Rocci Twitchell at rtrtwitchell@ucdavis.edu to arrange for annual maintenance or replacement tag.</p>				
<p>Fire extinguisher is properly mounted.</p> <p>Description/Corrective Action: Fire extinguisher must be mounted and easily accessible in the event of an emergency.</p>				
<p>Fire extinguisher monthly visual inspection is documented and up-to-date.</p> <p>Description/Corrective Action: Fire extinguishers must be visually inspected monthly and documented.</p>				
<p>Fire extinguishers are available as required.</p> <p>Description/Corrective Action: Portable fire extinguishers must be available within 75' or less for class A fires or within 50' for class B fires (flammable liquids).</p>				
<p>Fire extinguishers are fully charged, pin and/or security seal is intact.</p> <p>Description/Corrective Action: Fire extinguishers must be fully charged and operational at all times.</p>				
<p>Fire-rated doors are not propped open.</p> <p>Description/Corrective Action: Fire-rated doors must not be propped open. Magnetic hold-opens, linked to building alarm systems, are acceptable.</p>				

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<p>Items stored such that minimum clearance of 18" of sprinklers or 24" of ceiling without sprinklers is met.</p> <p>Description/Corrective Action: Title 8, §6170 requires 18" clearance between sprinklers and materials below and 24" from ceiling to materials below without sprinklers. Move items that prevent this required clearance.</p>				
<p>Fume Hoods</p>	Yes	No	Corrected	NA
<p>Audible/visual alarm is functional and/or visual airflow indicator is working.</p> <p>Description/Corrective Action: Fume hood must be equipped with a quantitative airflow monitor that continuously indicates air is flowing or an audible or visual alarm that is activated if airflow decreases to less than 80% of required airflow.</p>				
<p>Chemical work is conducted more than 6" from front of hood.</p> <p>Description/Corrective Action: To minimize potential for injury or exposure, hazardous chemicals and/or reactions should be kept at least 6" behind the plane of the sash.</p>				
<p>Fume hood has been certified within the past year.</p> <p>Description/Corrective Action: Annual check of fume hood is required to ensure the ability to maintain inward airflow.</p>				
<p>Fume hood illumination is functional.</p> <p>Description/Corrective Action: If fume hood illumination is available, it must be functional.</p>				
<p>Fume hood is not cluttered or used for storage.</p> <p>Description/Corrective Action: Fume hood should not be used for long-term storage of equipment, chemicals or supplies not regularly used. Fume hood should be kept clean and free of clutter at all times for improved airflow across the work surface.</p>				
<p>Fume hood users know how to check their airflow monitor to verify that the hood airflow is functioning properly. Users know how to check the certification sticker for annual testing.</p> <p>Description/Corrective Action: Fume hood operators must know where the quantitative airflow monitor or alarm system is located on the hood and how it is used to indicate an inward airflow during hood operation, and be able to determine the date of the last performance test and if the hood performance met the requirements.</p>				
<p>Proper sash height is indicated. Sash position does not exceed approved working height. Fume hood is kept closed when not in use.</p> <p>Description/Corrective Action: The sash and/or jamb of the fume hood must be marked to show the maximum opening at which the hood face velocity meets the required airflow. Fume hood should be kept closed when not in use.</p>				

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Gas	Yes	No	Corrected	NA
<p>Compressed gas cylinders are adequately secured.</p> <p>Description/Corrective Action: Compressed cylinders must be stored upright and adequately secured. Two, non-combustible restraints (upper 1/3 and lower 1/3) are recommended. "C"-clamps are not adequate to secure large cylinders.</p>				
<p>Compressed gas cylinders are labeled with contents and hazards.</p> <p>Description/Corrective Action: Compressed gas cylinders are required to have a shoulder label that includes contents and hazard information.</p>				
<p>Oxygen and combustible cylinders are separated by an appropriate distance or barrier.</p> <p>Description/Corrective Action: Oxygen cylinders in use or in storage shall be separated from fuel gas cylinders or combustible materials a minimum distance of 20 feet or by a non-combustible barrier at least 5 feet high, or a minimum of 18 inches (46 centimeters) above the tallest cylinder and having a fire-resistance rating of at least one hour.</p>				
<p>Toxic gases are properly stored in a ventilated cabinet/fume hood.</p> <p>Description/Corrective Action: Cylinders shall not be kept in unventilated enclosures such as lockers and cupboards.</p>				
<p>Valves of gas cylinders are capped when not in use.</p> <p>Description/Corrective Action: Valve protection devices must be in place when cylinder is not in use. The regulator must not remain installed when cylinder is not in-use.</p>				
General Safety	Yes	No	Corrected	NA
<p>Ceiling tiles/panels are not missing and are in good condition.</p> <p>Description/Corrective Action: Individual ceiling tiles adjacent to sprinkler heads must be in place to ensure activation of the sprinkler system during a fire. Groups of three or more ceiling tiles missing in areas not adjacent to sprinkler heads must be replaced to ensure activation.</p>				
<p>Floor is free of defects that could cause slipping, tripping or falling.</p> <p>Description/Corrective Action: Laboratory floor needs to be free of defects that could cause slip, trips and falls.</p>				
<p>Hand wash sink is available with soap and paper towels.</p> <p>Description/Corrective Action: Employees must be able to wash and dry their hands after working with potentially hazardous materials, after removing gloves and prior to leaving laboratory.</p>				

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<p>Lab areas are clean and uncluttered.</p> <p>Description/Corrective Action: Lab area should be clean and uncluttered, excess materials should be stored in neat, secure manner that provides easy access and reduces the potential for falling, collapsing, rolling or spreading of the material. Equipment, chemicals, glassware and supplies not in regular use should be stored in areas other than workstations. Paper on work surfaces and walls should be kept to a minimum. There should be minimal glassware on bench top, in sink, and in fume hood.</p>				
<p>Laboratory sinks delivering non-potable water, are labeled "Industrial Water - Do Not Drink"</p> <p>Description/Corrective Action: Water for industrial purposes must be posted in a manner to indicate that the water is unsafe and is not to be used for drinking.</p>				
<p>Laboratory ventilation pressure is negative with respect to corridors and offices.</p> <p>Description/Corrective Action: Negative pressure should be maintained between the laboratory and adjacent non-laboratory spaces to prevent uncontrolled chemical vapors from leaving the laboratory.</p>				
<p>Refrigerators/freezers are labeled appropriately for the use of the refrigerator/freezer. i.e. "not for storage of food for consumption", "not for storage of flammable materials".</p> <p>Description/Corrective Action: Permanent warning labels against the storage of food and beverages must be affixed to all laboratory refrigerators and freezers, i.e., "not for storage of food for consumption," "not for storage of flammable materials," etc.</p>				
<p>Spills are promptly and properly cleaned.</p> <p>Description/Corrective Action: All spills shall be cleaned promptly, using appropriate protective apparel and equipment.</p>				
<p>There is no eating or drinking in the laboratory or food storage with hazardous materials.</p> <p>Description/Corrective Action: Eating and drinking in areas where laboratory chemicals are stored or handled is prohibited. Workers should be directed to consume food and beverages outside the laboratory.</p>				
<p>Vacuum systems (both house systems and stand-alone vacuum pumps) are fitted with traps and/or protection (HEPA/hydrophobic) filter, if required.</p> <p>Description/Corrective Action: Improper trapping can allow vapor to be emitted from the exhaust of the vacuum system, resulting in either reentry into the laboratory and building or potential exposure to maintenance workers.</p>				
<p>PPE</p>	Yes	No	Corrected	NA
<p>Appropriate gloves are available for use with hazardous activities conducted within the laboratory.</p> <p>Description/Corrective Action: Gloves that are appropriate for the activity must be available in the laboratory. Chemical resistant gloves are required for handling hazardous materials.</p>				
<p>Equipment or process sound levels do not exceed 85 dBA.</p>				

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<p>Descriptive/Corrective Action: Protection against the effects of noise exposure shall be provided when the sound levels exceed 90 dBA for 8 hours. If the sound levels may exceed 85 dBA, a sound level check should be completed.</p>				
<p>Face shields are worn as appropriate.</p> <p>Description/Corrective Action: Face shields must be worn over safety glasses or chemical splash goggles when using cryogenics, large amounts of corrosives, or other eye/face splash hazards.</p>				
<p>Gloves are worn for laboratory procedures where skin contact with hazards may occur.</p> <p>Description/Corrective Action: Gloves are required for employees whose work involves exposure of hands to cuts; burns; harmful physical or chemical agents; or radioactive materials.</p>				
<p>If applicable, respirator use has been evaluated by EH&S and users are included in the campus respiratory protection program.</p> <p>Description/Corrective Action: Every employee that is required to wear a respirator must participate in the respiratory protection program which includes a medical evaluation and fit-testing.</p>				
<p>If applicable, specialty PPE needed (i.e. UV/IR glasses, lab aprons, cryogenic gloves) is available in the laboratory.</p> <p>Description/Corrective Action: The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). If such hazards are present, or likely to be present, the employer shall select, and have each affected employee use, the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment.</p>				
<p>Lab coats, appropriate to the activity, are worn.</p> <p>Description/Corrective Action: An appropriate lab coat must be worn when actively working in the laboratory unless an exemption to the UCOP PPE policy has been granted.</p>				
<p>Lab coats, properly fitted, are available.</p> <p>Description/Corrective Action: Employer is responsible for providing required PPE for protection against hazardous materials.</p>				
<p>Lab workers remove gloves before accessing common items, door knobs, elevator buttons, etc.</p> <p>Description/Corrective Action: Gloves should be removed before exiting the laboratory. In the event that hand protection is required for transport of chemical, one glove should be removed to access common items.</p>				
<p>Long pants (legs covered) and closed-toe/heel shoes are worn in the lab.</p> <p>Description/Corrective Action: UCOP PPE policy requires that long pants or equivalent and close-toed/close-heeled shoes be worn in the laboratory unless an exemption to the policy has been granted.</p>				
<p>Safety glasses or chemical splash goggles are worn in the laboratory when there is a risk of eye injury.</p>				

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Safety Equipment	Yes	No	Corrected	NA
<p>Description/Corrective Action: Eye protection is required when there is a risk of eye injury, such as puncture, abrasion, contusion or burn as a result of contact with flying particles, hazardous substances, projections or injurious light rays.</p>				
<p>A plumbed emergency eyewash /safety shower or emergency eyewash is immediately available where corrosive liquids are handled or used.</p> <p>Description/Corrective Action:</p> <p>Description/Corrective Action: An emergency eyewash or emergency eyewash/safety shower must be available in the room where corrosive liquids are handled or used.</p>				
<p>A plumbed emergency eyewash/safety shower or emergency eyewash is available within 10 seconds.</p> <p>Description/Corrective Action: An emergency eyewash and deluge shower must be accessible within 10 seconds of all chemical splash or eye injurious hazards.</p>				
<p>Access to emergency eyewash/shower is free of items that obstruct their use.</p> <p>Description/Corrective Action: The area of the eyewash and shower equipment must be free of items that obstruct their use.</p>				
<p>Annual test of emergency eyewash/safety shower or emergency eyewash has been completed or documented.</p> <p>Description/Corrective Action: A flow verification test and inspection of plumbed eyewash and shower equipment must be completed annually.</p>				
<p>Appropriate chemical spill kit is available.</p> <p>Description/Corrective Action: Spill control kits tailored to deal with the potential risk associated with the materials being used in the laboratory are required.</p>				
<p>Calcium gluconate for Hydrofluoric acid (HF) exposure first aid is available. Calcium gluconate has not expired. Training on HF first aid is documented.</p> <p>Description/Corrective Action: Exposure to HF can lead to hypocalcemia. Therefore, hydrofluoric acid exposure is often treated with calcium gluconate, a source of Ca²⁺ that sequesters the fluoride ions. Non-expired calcium gluconate should be available and staff should be trained in HF first aid.</p>				
<p>First Aid Kit is available.</p> <p>Description/Corrective Action: Title 8, §3400 requires adequate first-aid materials be readily available for employees on every job. Purchase simple first aid kit and replenish as needed.</p>				
<p>Monthly activation of emergency eyewash/safety shower is documented.</p> <p>Description/Corrective Action: Plumbed eyewash and shower equipment must be activated at least monthly to flush the line and verify operation.</p>				
Seismic	Yes	No	Corrected	NA

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<p>Heavy items and precariously situated items are not stored on higher shelves.</p> <p>Description/Corrective Action: For seismic concerns, heavier items must be secured or placed on lower shelves.</p>				
<p>Large equipment is seismically anchored.</p> <p>Description/Corrective Action: To reduce potential injury and the blocking of doors and/or exits during seismic events, items over 5' tall, i.e., file cabinets, bookcases and other tippable items, should be anchored.</p>				
<p>Overhead storage is secured.</p> <p>Description/Corrective Action: To decrease the potential for injury or blocking aisles during seismic events, items stored overhead must be secured. Either move overhead storage or secure.</p>				
<p>Shelves have restraints to prevent items from falling.</p> <p>Description/Corrective Action: Shelves used for the storage of hazardous materials must have a lip or guard to reduce the potential for chemical spills during a seismic event.</p>				
<p>Training</p>	Yes	No	Corrected	NA
<p>Laboratory personnel have completed UC Laboratory Safety Fundamentals training.</p> <p>Description/Corrective Action: All laboratory workers are required to complete the UC Laboratory Safety Fundamentals e-Course prior to beginning work in the laboratory and every three years thereafter. Log on to LMS and complete required e-Course.</p>				
<p>Specialized training for lab-specific hazards has been documented.</p> <p>Description/Corrective Action: Documented training is required for all hazardous substances, processes, procedures and equipment in the work area (regulated carcinogens, Blood borne Pathogens, radiation, lasers use, etc.). Site-specific orientation training is required for all new laboratory personnel.</p>				
<p>Spill response training is documented.</p> <p>Description/Corrective Action: All employees should be trained in the appropriate spill response procedures for both minor and major chemical spills. Annual retraining is required.</p>				
<p>Training on laboratory specific Standard Operating Procedures (SOP) is documented.</p> <p>Description/Corrective Action: Documented training on all SOPs is required and specific and unambiguous training records must be available upon request.</p>				
<p>Training on the Chemical Hygiene Plan is documented.</p> <p>Description/Corrective Action: Documented training is required for the Chemical Hygiene Plan.</p>				
<p>Training on the Emergency Action Plan is documented.</p> <p>Description/Corrective Action: Documented training is required for the Emergency Action Plan. Annual retraining is required.</p>				

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<p>Training on the Injury and Illness Prevent Plan (IIPP) is documented.</p> <p>Description/Corrective Action: Documented training is required for the IIPP. Annual retraining is required.</p>				
<p>Training to manage or handle hazardous waste is documented.</p> <p>Description/Corrective Action: Laboratory workers that generate or handle hazardous waste must be trained in storing, labeling, proper disposal and accumulation times for hazardous waste.</p>				
Waste	Yes	No	Corrected	NA
<p>All containers holding hazardous waste are closed except when adding or removing waste.</p> <p>Description/Corrective Action: A container holding hazardous waste must be closed except when adding or removing waste.</p>				
<p>All hazardous waste containers are compatible with the contents and in good condition.</p> <p>Description/Corrective Action: All hazardous waste containers must be compatible with the contents and in good condition. If a container holding hazardous waste is not in good condition, or if it begins to leak, the contents shall be transferred into a container that is in good condition. A container shall be made of or lined with materials which will not react with and are otherwise compatible with, the hazardous waste to be transferred or stored, so that the ability of the container to contain the waste is not impaired.</p>				
<p>All sharps are disposed of in a sturdy container or a hard-walled sharps container (non-red without biohazard label or red with biohazard) as appropriate.</p> <p>Description/Corrective Action: All sharps must be disposed of in a sturdy container (clean lab glass) or a hard-walled sharps container (non-red without biohazard label or red with biohazard) as appropriate. Improper disposal of sharps can cause injury and can also be a source of infectious, chemical or radiological aerosol and surface contamination.</p>				
<p>Biomedical waste containers have a tight-fitting lid in place.</p> <p>Description/Corrective Action: Biomedical waste containers must have a tight-fitting lid in place to prevent leakage during collection, handling, processing, storage, transport or shipping.</p>				
<p>Biomedical waste in red bags is being properly disposed in accordance with UCD Policy.</p> <p>Description/Corrective Action: All red bag waste must be disposed of in accordance with the Medical Waste Management Act.</p>				
<p>Biomedical waste secondary containment is used.</p> <p>Description/Corrective Action: If the outside of the primary biomedical container is contaminated, the primary container shall be placed in a second container which prevents leakage during collection, handling, processing, storage, transport or shipping.</p>				
<p>Hazardous waste is being properly disposed through EH&S.</p> <p>Description/Corrective Action: All hazardous waste must be disposed of through EH&S not evaporated in fume hoods or disposed of in regular trash.</p>				

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<p>Hazardous waste in secondary containment.</p> <p>Description/Corrective Action: All hazardous waste must be managed so as to ensure that incompatible laboratory wastes are not mixed, and are otherwise prevented from coming in contact with each other. All hazardous materials must be in secondary containment.</p>				
<p>Hazardous waste is not being accumulated beyond regulatory time limits (i.e., 90 days for extremely hazardous waste, 9 months for other hazardous waste).</p> <p>Description/Corrective Action: Extremely Hazardous waste may be accumulated for no greater than 90 days and other hazardous waste for no greater than one year. Due to EH&S waste processing time, hazardous waste can be held in laboratory no longer than 9 months.</p>				
<p>Hazardous waste is properly labeled.</p> <p>Description/Corrective Action: Hazardous waste must be labeled with "Hazardous Waste", the start date of accumulation, the contents, the hazard classification, the physical state and the name and address of the person producing the waste.</p>				
<p>Sharps containers are properly labeled, as to contents, hazard, etc.</p> <p>Description/Corrective Action: Sharps containers must be labeled with the words "sharps waste". Biohazard sharps containers must include the international biohazard symbol and the word "BIOHAZARD".</p>				
<p>Sharps container's contents are not past the fill line.</p> <p>Description/Corrective Action: Sharps containers must be prepared for disposal when $\frac{3}{4}$ full and be taped closed or tightly lidded to preclude loss of contents.</p>				
<p>Universal waste is properly labeled/discarded/contained.</p> <p>Description/Corrective Action: Universal waste must be contained in a manner that prevents breakage and release of components to the environment. The container shall be structurally sound and compatible with the contents. Universal waste must be labeled or marked to identify the type of universal waste (i.e. Universal Waste-Battery(ies), Universal Waste-Mercury-Containing Equipment, Universal Waste-CRT(s)). Universal waste shall be accumulated for no longer than one year from the date the universal waste was generated, or received from another universal waste handler.</p>				

IIPP – Appendix D

January 2016

Please access the [Injury Reporting Procedure](#) page on the Safety Services website.

<http://safetyservices.ucdavis.edu/article/injury-reporting-procedure>

Complete the electronic [Employer's First Report \(EFR\)](#) as soon as practicable.

UCD Employer's Report of Occupational Injury or Illness		
UNIVERSITY POLICY REQUIRES THAT INDUSTRIAL INJURY/ILLNESS BE REPORTED TO WORKERS' COMPENSATION WITHIN 24 HOURS OF OCCURRENCE AND STATE REGULATIONS REQUIRE THAT ALL ACCIDENTS BE INVESTIGATED.		
In the event of a serious injury or hospitalization, call Workers' Compensation immediately at (530) 752-7243. This form must be completed in its entirety and mailed or faxed (530) 752-3439 to Workers' Compensation. Omission of information could result in a delay of benefits.		
EMPLOYEE MUST COMPLETE THESE SECTIONS:		
EMPLOYEE DATA	Employee Name: _____	
	Employee's UC Davis ID #: _____	
	Address: _____	
	Home Phone: () _____	
	City/State/Zip: _____	Date of Birth: _____
	Sex: <input type="checkbox"/> Female <input type="checkbox"/> Male	
	Department/Location: _____	
	Payroll Title/TC: _____	Employee's Work Phone: () _____
Supervisor's Name: _____	Date of Hire: _____	
Supervisor's Work Phone: () _____	Annual Gross Salary: \$ _____	
Employee () Volunteer () Student-Employee () _____		
() hours per day () days per week () total weekly hours		
EMPLOYEE STATEMENT	Specific Injury/Illness/Exposure: _____	
	Body Part(s) affected: _____	
	Date of injury/illness: _____	
	Location where injury or illness occurred: _____	
	What equipment, materials or chemicals caused the injury/illness? : _____	
	Others Injured? <input type="checkbox"/> Yes <input type="checkbox"/> No Who witnessed this injury? _____	
Explain in detail how the injury occurred. Include specific activities/tasks performed at the time. _____ _____		
Medical Treatment provided by: ___ Employee Health Services ___ Sutter Davis Hospital ER Other: (Provide Name & Phone #) _____ ___ Private Physician ___ UC Davis Medical Center ___ First Aid, no medical care needed. Employee Signature: _____ Today's Date: _____		
EMPLOYER'S INVESTIGATION AND STATEMENT (EMPLOYER COMPLETES):		
EMPLOYER	After the investigation, explain in detail how the injury/illness occurred and the specific activity being performed: _____ _____	
	What was the injury, illness or exposure? _____ _____	
INITIAL CAUSE	CONTRIBUTING FACTORS AND ACTIVITIES	PREVENTIVE ACTIONS
<input type="checkbox"/> Struck by or against object (indicate) _____ <input type="checkbox"/> Caught in/under/between _____ <input type="checkbox"/> Fall / Slip / Trip _____ <input type="checkbox"/> Material handling or lifting _____ <input type="checkbox"/> Repetitive motion _____ <input type="checkbox"/> Chemical exposure _____ <input type="checkbox"/> Body fluid exposure: _____ ___ Needle stick _____ ___ Sharps _____ <input type="checkbox"/> Animal bite _____ <input type="checkbox"/> Other, Explain _____	Equipment <input type="checkbox"/> Equipment failure _____ <input type="checkbox"/> Equipment unavailable _____ <input type="checkbox"/> Improper equipment or material used for job _____ Personal protective equipment <input type="checkbox"/> Not worn _____ <input type="checkbox"/> Not readily available _____ <input type="checkbox"/> Not adequate for the task _____ <input type="checkbox"/> Personal protective equipment failure _____ Training/Experience <input type="checkbox"/> Lack of training _____ <input type="checkbox"/> Safety training provided, not followed _____ <input type="checkbox"/> New task for employee or lack of experience _____ Work Area <input type="checkbox"/> Work area set up improperly _____ <input type="checkbox"/> Inadequate lighting or noise issues _____ <input type="checkbox"/> Housekeeping issues _____ <input type="checkbox"/> Environmental factors (rain, wind, temp., etc) _____	<input type="checkbox"/> Ventilation issues _____ <input type="checkbox"/> Ergonomic factors _____ Employee <input type="checkbox"/> Physically not able to do work _____ <input type="checkbox"/> Employee fatigue _____ <input type="checkbox"/> Unbalanced or poor position or motion _____ <input type="checkbox"/> Incorrect procedures used for task _____ <input type="checkbox"/> Other unsafe practice _____ Assistance <input type="checkbox"/> Difficult to perform task without help _____ <input type="checkbox"/> Safety features or devices not readily available _____ <input type="checkbox"/> Assistive devices not used _____ <input type="checkbox"/> Lack of policy/procedure _____ <input type="checkbox"/> Animal (explain below) _____ <input type="checkbox"/> Other (explain) _____
SUPERVISOR WILL: <input type="checkbox"/> Develop/revise safety procedures and update IIPP or Chem. Hyg. Plan _____ <input type="checkbox"/> Request ergonomic evaluation _____ <input type="checkbox"/> Order new equipment _____ <input type="checkbox"/> Order new personal protective equipment _____ <input type="checkbox"/> Remove equipment from use and repair/replace _____ <input type="checkbox"/> Schedule preventive maintenance _____ <input type="checkbox"/> Will retrain employee before task is re-assigned. _____ <input type="checkbox"/> Perform on-site review of work activity, update job safety analysis. _____ <input type="checkbox"/> Reconfigure work area _____ <input type="checkbox"/> Communicate corrective actions to others in job category. _____ <input type="checkbox"/> Other _____	Preventive actions will be completed by: Name: _____ Expected date of completion: _____	
SUPERVISOR'S OR MANAGER'S SIGNATURE: _____		Date of Investigation: _____
DEPARTMENT HEAD'S SIGNATURE: _____		Date: _____
PLEASE NOTE: COMPLETING THIS FORM IS NOT AN ADMISSION OF UNIVERSITY LIABILITY		

SAFETY TRAINING ATTENDANCE RECORD

Training Topic: _____ Date: _____
(attach a copy of the training session curriculum)

Instructor: _____ Training Aids: _____

Location: _____ Time: _____

Attendees – Please print and sign your name legibly. Use additional sheets if necessary.

No.	Print Name	Signature/Date
1.	_____	_____
2.	_____	_____
3.	_____	_____
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30.	_____	_____

Biological Hazards - Recognition, Evaluation and Control

1. RECOGNITION OF BIOLOGICAL HAZARDS

A. Biohazard

- Biohazardous materials and organisms include all infectious organisms (bacteria, chlamydia, fungi, parasites, rickettsias, viruses, etc.) that can cause disease in humans, or cause significant environmental or agricultural impact.
- Other biohazards include work with human or primate tissues, fluids, cells or cell culture; recombinant DNA; transgenic plants or animals; human gene therapy; releases of recombinant DNA to the environment; and work with animals known to be reservoirs of zoonotic diseases.

2. EVALUATION OF BIOLOGICAL HAZARDS

A. Biosafety Level - The laboratory conditions under which the biohazardous agent can be safely handled.

a. Levels

- There are four biosafety levels. These levels have been summarized on the following table, which consist of combinations of laboratory practices and techniques, safety equipment, and laboratory facilities.

b. Selection

- The selection of an appropriate biosafety level is dependent upon a number of factors, most importantly the virulence, pathogenicity, biological stability and communicability of the agent, nature or function of the laboratory, quantity and concentration of the agent, endemicity of the agent, and availability of effective vaccines or therapeutic measures.
- The principal investigator is primarily responsible for assessing risks and for implementing the recommended biosafety levels.
- The biosafety level should be commensurate with that required for the agent of highest virulence known or likely to be encountered in the course of contemplated work. For example, all diagnostic sera of human origin (i.e., blood, body fluids, etc.) should be considered potentially infectious for Hepatitis and HIV.
- If, in the course of diagnostic or other laboratory examinations there is evidence that the materials being studied contain an agent of higher than expected risk, the biosafety level should be raised accordingly.

BMBL Section III – Summary of Recommended Biosafety Levels for Infectious Agents^a

BSL	Agents	Practices	Safety equipment (Primary Barriers)	Facilities (Secondary barriers)
1	Not known to consistently cause disease in healthy adults	Standard Microbiological Practices	No special primary or secondary barriers required. PPE: laboratory coat and gloves; eye/face protection as needed	<ul style="list-style-type: none"> Open bench top Sink required
2	Associated with human disease, hazard = percutaneous injury, ingestion, mucous membrane exposure	BSL-1 practices plus: Limited access, Biohazard Warning signs, "Sharps" precautions, Biosafety manual defining any needed waste decontamination or medical surveillance policies	Primary barriers=Class I or II BSCs or other physical containment devices used for all manipulations of agents that cause splashes or aerosols of infectious materials; PPE: laboratory coats, gloves, face protection as needed	BSL-1 plus: Autoclave available
3	Indigenous or exotic agents with potential for aerosol transmission; disease may have serious or lethal consequences	BSL-2 practices plus: <ul style="list-style-type: none"> Controlled access Decontamination of all waste Decontamination of lab clothing before laundering 	Primary barriers=Class I or II BSCs or other physical containment devices used for all open manipulations of agents; PPE: protective lab clothing; gloves; respiratory protection as needed	BSL-2 plus: <ul style="list-style-type: none"> Physical separation from access corridors Self-closing, double-door access Exhausted air not recirculated Negative airflow into laboratory Entry through airlock/anteroom Hand washing sink near lab exit
4	Dangerous/exotic agents which pose high risk of life- threatening disease, aerosol- transmitted lab infections; or related agents with unknown risk of transmission	BSL-3 practices plus: <ul style="list-style-type: none"> Clothing change before entering Shower on exit All material decontaminated on exit from facility 	Primary barriers=All procedures conducted in Class III BSCs or Class I or II BSCs <u>in combination with</u> full-body, air-supplied, positive pressure personnel suit	BSL-3 plus: <ul style="list-style-type: none"> Separate building or isolated zone Dedicated supply and exhaust, vacuum and decon systems Other requirements outlined in the text

BMBL Section IV – Summary of Recommended Biosafety Levels for Activities in Which Experimentally or Naturally Infected Vertebrate Animals Are Used ^a

BSL	Agents	Practices	Safety equipment (Primary Barriers)	Facilities (Secondary barriers)
1	Not known to consistently cause disease in health human adults	Standard animal care and management practices, including appropriate medical surveillance programs	As required for normal care of each species. PPE: laboratory coats and gloves; eye/face protection as needed	<ul style="list-style-type: none"> • Standard animal facility • No recirculation of exhaust air • Directional air flow recommended • Hand washing sink available
2	Associated with human disease. Hazard: percutaneous exposure, ingestion, mucous membrane exposure	ABSL-1 practices plus: <ul style="list-style-type: none"> • Limited access • Biohazard warning signs • Sharps precautions • Biosafety Manual • Decontamination of all infectious wastes and of animal cages prior to washing 	ABSL-1 equipment plus primary barriers: containment equipment appropriate for animal species; PPE: laboratory coats, gloves, face and respiratory protection as needed	ABSL-1 facility plus: <ul style="list-style-type: none"> • Autoclave available • Hand washing sink available • Mechanical cage washer recommended • Negative airflow into animal and procedure rooms recommended
3	Indigenous/exotic agents with potential for aerosol transmission; disease may have serious health effects	ABSL-2 practices plus: <ul style="list-style-type: none"> • Controlled access • Decontamination of clothing before laundering • Cages decontaminated before bedding removed • Disinfectant foot bath as needed 	ABSL-2 equipment plus: <ul style="list-style-type: none"> • Containment equipment for housing animals and cage dumping activities • Class I or II BSCs available for manipulative procedures (inoculation, necropsy) that may create infectious aerosols; PPE: appropriate respiratory protection 	ABSL-2 facility plus: <ul style="list-style-type: none"> • Physical separation from access corridors • Self-closing, double-door access • Sealed penetrations and windows • Autoclave available in facility • Entry through anteroom/airlock • Negative airflow into animal and procedure rooms • Hand washing sink near exit of animal/procedure room
4	Dangerous/exotic agents that pose high risk of life threatening disease; aerosol transmission, or related agents with unknown risk of transmission	ABSL-3 practices plus: <ul style="list-style-type: none"> • Entrance through change room where personal clothing is removed and laboratory clothing is put on; shower on exiting • All wastes are decontaminated before removal from the facility 	ABSL-3 equipment plus: Maximum containment equipment: Class III BSCs or Class I or II BSCs <u>in combination with</u> full-body, air-supplied, positive pressure personnel suit used for all procedures and activities	ABSL-3 facility plus: <ul style="list-style-type: none"> • Separate building or isolated zone • Dedicated supply and exhaust, vacuum and decontamination systems • Other requirements outlined in the text

^a U.S. Department of Health and Human Services Centers for Disease Control and Prevention and National Institutes of Health, "Biosafety in Microbiological and Biomedical Laboratories", <https://www.cdc.gov/labs/BMBL.html>

B. Waste

1. **Biohazardous Waste** - Biohazardous waste means any of the following:
 - Human or animal specimen cultures from medical and pathological laboratories, cultures and stocks of infectious agents from research laboratories, waste from the production of bacteria, viruses or the use of spores, discarded live and attenuated vaccines, culture dishes and contaminated devices used to transfer, inoculate, and mix cultures.
 - Human surgery specimens or tissues removed at surgery or autopsy, which are suspected by the attending physician or dentist of being contaminated with infectious agents' known to be contagious to humans.
 - Animal parts, tissues, fluids, or carcasses suspected of being contaminated with infectious agents' known to be contagious to humans.
 - Waste which contains recognizable fluid blood, fluid blood products, containers, or equipment containing fluid blood or blood from animals, having been infected with diseases that are highly communicable to humans.
 - Waste containing discarded materials contaminated with excretion, exudates, or secretions from humans who are required to be isolated to protect others from communicable diseases or isolated animals having been infected with diseases communicable to humans.
 - Waste which is hazardous only because it is comprised of human surgery specimens or tissues which have been fixed in formaldehyde or other fixatives, or only because the waste is contaminated through contact with, or having previously contained chemotherapeutic agents, including, but not limited to, gloves, disposable gowns, towels, and intravenous solution bags and attached tubing which are empty. (Chemotherapeutic agent means an agent that kills or prevents the reproduction of malignant cells.)
 - Waste that is hazardous only because it is comprised of pharmaceuticals.
2. **Medical Waste** - Medical waste is laboratory, pathology or sharps biohazardous waste which is generated or produced as a result of:
 - diagnosis, treatment, or immunization of human beings or animals
 - research
 - producing or testing biologicals. (Biologicals mean medicinal preparations made from living organisms and their products, including, but not limited to, serums, vaccines, antigens, and antitoxins.) that has been infected with potential or known diseases communicable to humans.
3. **Sharps Waste** - Any device having acute rigid corners or edges, or projections capable of cutting or piercing, including hypodermic needles, syringes, blades, needles, broken glass items, pipettes and vials which are contaminated with other medical waste.

3. CONTROL OF BIOLOGICAL HAZARDS

- A. Working with Human Biohazards - Follow the recommended biosafety level practices and procedures for the agent(s) used in the lab. Some key practices to be followed when working with human biohazards:
- A hazard warning sign incorporating the biohazard symbol must be posted on access doors and on equipment where human biohazards are used or stored.
 - Use personal protective equipment (PPE) such as gloves, lab coat, etc., when handling human biohazards.
 - Use a biosafety cabinet when handling human biohazards, particularly when procedures may generate aerosols or splashing.
 - Decontaminate all work surfaces after completion of work.
 - Properly dispose of all waste generated from working with human biohazards (i.e., Accumulation Site, chemical disinfections, or disposal through an approved vendor.
 - Contact EH&S @ 530-752-1493
- B. Handling "Other" Medical and Sharps Waste
- Waste, which is contaminated through contact with, or having previously contained, chemotherapeutic agents, shall be segregated for storage. This type of waste must be placed in a secondary container, which shall be labeled on the lid and the sides with the words "Chemotherapy Waste", "CHEMO", or other labels approved EH&S. The label must be visible from any lateral direction, to ensure treatment of the biohazardous waste. Chemotherapy waste is picked-up by a vendor for final treatment at an off- site facility. (Contact EH&S @ 530-752-1493 additional information.)
 - Biohazardous waste which is comprised of human surgery specimens or tissues which have been fixed with formaldehyde or other fixatives, shall be segregated for storage then disposed of by incineration at an off-site facility. (Contact EH&S @ 530-752-1493 additional information.)
 - Liquid or semi-liquid biohazardous waste, such as blood or culture solutions, must be properly decontaminated prior to being discharged into the public sewage system. Example of proper decontamination of liquid waste is adding bleach solution and allowing at least 30 minutes of contact time.
- C. "Red Bags"
- Non-sharp infectious waste must be placed in red biohazard bags that are labeled with the words "Biohazardous Waste" or with the international biohazard symbol and the word "Biohazard." During accumulation, red bags must be placed in a rigid secondary container.
 - Full bags should be tied to prevent leakage or expulsion of contents during future storage, handling or transport. (Recommendation: Bags should not be more than 2/3 full and use tape to seal bag.)
 - During storage, full untreated, red bags must be placed in a rigid container which are leak resistant, have tight fitting covers and kept clean and in good repair. Containers may be any color and labeled on the lid and on the sides with the words "Biohazardous Waste" or with the international

biohazard symbol and the word "BIOHAZARD" so as to be visible from any lateral direction.

- Red bags must be treated by a campus approved method (e.g. by UCDMC or a vendor for final treatment at an off-site facility. (Contact EH&S @ 530-752-1493 for additional information.)
- Full biohazard bags shall not be stored above 0°C (32°F) for more than seven days or below 0°C (32 °F) for more than 90 days before treatment.

D. Sharps Containers

- Place all sharps waste into appropriate sharps container. Sharps containers may be purchased through Aggie Buy on-line:
<https://supplychain.ucdavis.edu/procure-contract/aggiebuy>
- Do not overfill sharps containers. Do not shake up the container to try to fit more materials into it. Shaking the container aerosolizes the materials contained within.
- Sharps containers are "Single Use Only". Do not reuse sharps containers.
- Sharps containers ready for disposal must be tightly sealed or taped to ensure that contents will not spill. Full sharps containers should not be stored longer than 7 days. Place "capped" sharps containers in a red bag in the Medical Waste Toter at your Medical Waste accumulation site.

E. Biosafety Cabinets - Biosafety cabinets are designed to protect you from splashes and aerosols that are contaminated with biohazards.

1. Airflow

- Place necessary materials in the biosafety cabinet before beginning work to minimize the number of arm movement disruptions across the fragile air barrier of the cabinet.
- Ensure that the front grille of the cabinet is not blocked with any materials (i.e., absorbent paper, notebook, etc.) or equipment to allow cabinet to function properly.
- Place all materials as far back as practical, toward the rear edge of the work surface and away from the front grille of the cabinet to take advantage of the air split in the center of the cabinet.
- Delay manipulation of materials for approximately one minute after placing hands/arms inside the cabinet to allow stabilization of air in the cabinet.

2. Control Methods for Contamination

- Disinfect the work surface, interior walls, and interior surface of window of the cabinet to reduce contamination of materials to be used in the cabinet.
- Disinfect surfaces of materials and containers placed into the cabinet to minimize contamination of cultures.
- Do not bring potentially contaminated materials out of the cabinet until they have been surface decontaminated or placed in a closeable container for proper decontamination.
- Decontaminate surfaces of all containers and equipment removed from the cabinet when work is completed.
- Wipe down the cabinet's work surface, sides, back, and interior of the glass at the end of the workday.
- Decontaminate biosafety cabinets before HEPA filters are changed or internal work is done and before cabinet is relocated. The most common method for this type of decontamination is the use of formaldehyde gas. An EH&S approved vendor must conduct this decontamination procedure. Technical

Safety Service (TSS) is one approved vendor. TSS can be contacted @ 510-845-5591 to conduct biosafety cabinet decontamination.

3. Work practices

- Turn cabinet on for approximately three to five minutes to allow it to purge or remove any particulates in the cabinet.
- Wear personal protective equipment including a standard cotton or barrier lab coat, gloves, etc., to protect the worker from contact with biohazardous materials used in the cabinet.
- Adjust stool/seat height so that worker's face is above the front opening of the cabinet.
- Place plastic-backed absorbent paper on the work surface (note: ensure that grilles are not blocked by the absorbent paper), if desired. This facilitates routine cleanup and reduces splatter and aerosol formation during a spill. Absorbent toweling must be properly decontaminated prior to disposal.
- Arrange materials within the cabinet to allow active work to flow from the clean to contaminated area across the work surface. (Limit the movement of "dirty" items over "clean" items.) This reduces the potential for cross-contamination in the cabinet.
- Place bulky items such as biohazard bags, discard pipette trays, and suction collection flasks to one side of the interior of the cabinet to minimize risk of cross-contamination.
- Do not tape a biohazard collection bag to the outside of the cabinet. Do not use upright pipette collection containers in the cabinet or place them on the floor outside the cabinet. Frequent inward and outward movement needed to place objects in these containers is disruptive to the integrity of the cabinet air barrier and can compromise personnel and product protection.
- Follow good microbiological techniques when working in a cabinet. For example, techniques to reduce splatter and aerosol generation will minimize the potential for personnel exposure to infectious materials manipulated within the cabinet.
- Do not use open flames in a cabinet. An open flame in a biosafety cabinet creates turbulence that disrupts the pattern of air supplied to the work surface. Open flames are not required in the near microbe-free environment of a biosafety cabinet. If absolutely necessary, touch-plate micro burners equipped with a pilot light to provide a flame on demand may be used. (Internal cabinet air disturbance and heat buildup will be minimized.)

4. Certification

All campus biosafety cabinets must be certified annually, to ensure that unit is functioning properly. Contact Technical Safety Service (TSS) @ 510-845-5591 to conduct biosafety cabinet certification.

Source(s):

Biosafety in Microbiological and Biomedical Laboratories , CDC, NIH, U.S. Dept. of Health and Human Resources, 5th edition, December 2009

California Medical Waste Management Act, Division 20, Chapter 6.1, California Health and Safety Code Primary Containment for Biohazards: Selection, Installation and Use of Biological Safety Cabinets , CDC, NIH, U.S. Dept. of Health and Human Services, Sept. 1995

Chemical Hazards – Recognition, Evaluation and Control

1. RECOGNITION OF CHEMICAL HAZARDS

Working with chemicals always involves the risk of exposure. It is important to review and understand any information about hazards and special precautions regarding the handling and use of a chemical. Hazardous chemicals can be classified into four types of hazards:

- Flammable
- Corrosive
- Reactive
- Toxics (e.g. acute poisons, carcinogens, mutagens, teratogens, etc.)

In general, chemicals should be stored with other chemicals of the same type and all chemicals should be stored in secondary containment. Chemical exposure should be minimized as much as possible through the use of engineering controls like chemical fume hoods, through work practices that minimize volumes and substitute less hazardous materials, and through personal protective equipment (PPE) like gloves, splash goggles, and lab coats.

2. EVALUATION OF CHEMICAL HAZARDS

A. Safety (Material) Data Sheets (SDS's)

1. An SDS outlines a substance's physical and chemical hazards that include but are not limited to:
 - Identity Information
 - Hazardous Ingredients
 - Physical/Chemical Characteristics
 - Fire and Explosion Hazard data
 - Reactivity Data
 - Health Hazard Data
 - Precautions for Safe Handling & Use
 - Control Measures
2. In accordance with the UC Davis Hazard Communication Program, companies that sell hazardous substances to UCD are required to provide an SDS on each substance and mixture of hazardous substances.
3. Accessing SDS'S's
 - i. From the EH&S office:
Contact EH&S at (530) 752-1493 for technical assistance.
 - ii. Internet Resources
The EH&S Homepage has identified sites having large collections of SDS'S's and are a good place to start your search.
<https://safetyservices.ucdavis.edu/units/ehs/research/safety-data-sheets>

B. Health Effects of Chemicals

CHEMICAL HAZARDS

Working with chemicals always involves the risk of chemical exposure. The health risk is dependent upon the toxicity of the chemical, the types of effects and the various routes of entry.

1. Toxicity vs. Hazard

Toxicity	ability of a chemical to act as a poison or cause injury to tissues.
Hazard	likelihood that a chemical will cause injury in a given environment or situation; degree of hazard depends on how toxic the substance is, how it is absorbed, etc

2. Acute vs. Chronic Exposures

Acute Exposures	exposure of short duration, usually to relatively high concentrations or amounts of material
Chronic Exposures	continuous or intermittent exposure extending over a long period, usually to relatively low material amounts or concentrations.

3. Local vs. Systemic Effects

Local Effects	effects of the chemical may be localized on a specific area of the body such as nose or throat
Systemic Effects	entire body system and organs are all affected by exposure to the chemical

C. Threshold Limits Values - TLV-TWA

Most health effects are dependent on the level of concentration of the exposures. The TLV-TWA is the allowable time-weighted average (TWA) airborne concentration of a material to which most workers can be exposed, during a normal 8-hr workday or 40-hr week, without adverse effects.

D. Dose - Response Relationship

Toxicological studies show that there is a relationship between the chemical dose and the response that is produced in the body. For example, a small amount of formaldehyde will effect minutely on the biologic tissue while large amounts of the same chemical will cause severe effect in a biologic system. This dose-response relationship can be plotted out.

E. Routes of Entry

There are various routes of entry whereby chemicals can gain entrance into the physical body. These routes are:

1. Inhalation
2. Skin Absorption
3. Ingestion
4. Injection

F. Target Organ Effects

Chemically caused effects from exposure to a material on a specific listed organs and systems such as liver, kidneys, nervous system, lungs, skin, and eyes.

3. CONTROL METHODS FOR CHEMICAL HAZARDS**A. Designated Area**

This is an area assigned for the usage of either a particularly hazardous substance or purpose. For example, if carcinogens are being used in the lab, a "designated area" should be assigned, and warning label should be posted.

1. Clean Area

There are no longer clean areas allowed in an active research laboratory.

B. Engineering Controls

This is the most effective and desirable method for minimizing risk of exposure either to toxic chemicals or to mechanical equipment. Examples of engineering controls: guards, remote controls, or interlock systems

However, for toxic fumes, mists, and vapors, ventilation systems are the best approaches to help reduce personal exposure to acceptable levels. Generally, there are two types of ventilation systems:

1. Dilution Ventilation

In most buildings a certain percentage of the building air is recirculated periodically through the building ventilation systems but in laboratories all air is exhausted directly to the outside. This "single pass" system is a type of "dilution ventilation" system for controlling low risk airborne contaminants. They are simply exhausted to the outside before they can build to hazardous levels.

2. Local Exhaust Ventilation

Used for moderate to high-risk contaminants. Local exhaust systems capture the airborne contaminants much more effectively than dilution systems such as chemical fume hoods

3. Fume Hoods

The fume hood is designed to contain and disperse gases, vapors, and aerosols to the external environment. It does not provide absolute containment or protection from the materials in the hoods, however, a properly designed hood in a properly designed room can provide adequate protection of the following practices are observed:

- Inspect and ensure that the hood is working.
- Do not store chemicals and equipment in the hood
- Remove unnecessary chemicals and equipment.
- All equipment and experiments should be at least 6 inches back from the front sash.
- Position the sash no higher than the approved working height that is designated by a fluorescent yellow sticker.
- When evaporating or distilling perchloric acid, special perchloric acid fume hoods MUST be used.

C. Work Practice Controls

In most cases, a well-designed set of work practices is the best risk management tool.

1. Chemical Transportation
Assure that an unbreakable secondary container is being used, and that transport carts are designed for this purpose.
2. Eating and Drinking
There should be no eating, drinking, chewing of gum or tobacco, application of cosmetics, storage of utensils, food, or food containers in the laboratories.
3. Pipetting
Mechanical pipetting aids should always be used for all pipetting procedures. Oral pipetting is prohibited
4. Personal Hygiene
All personnel should wash their hands immediately after the completion of any procedure in which chemicals have been used and when they leave the laboratory. If hazardous chemical exposures occur to skin, immediately shower or wash affected areas for 15 minutes.
5. Housekeeping
Keeping the working area clean and orderly reduces the frequency and severity of accidents. Here is some common sense tips:
 - Keep aisles, exits, stairs and hallways free of obstructions.
 - Avoid slip hazards by keeping the floor clean of ice, stoppers, glass beads or rods, other small items and spilled liquids.
 - Keep drawers and cabinet doors closed.
 - Never store chemicals on the floor.
 - Workspaces and storage areas should be kept clear of broken glassware, leftover chemicals and scraps of paper.
 - Place all non-contaminated broken glass in rigid containers with plastic liners clearly marked "Broken Glass".

D. Standard Operating Procedures (SOP)

Lab staff should prepare a SOP for hazardous operations as well as the use, storage and disposal of hazardous materials. SOPs serve as a training tool for new workers. SOP templates for common hazard classes can be found here:

<https://safetyservices.ucdavis.edu/units/ehs/research/chemical/sop-templates>

E. Personal Protective Equipment (PPE)

1. PPE comprises of clothing or equipment that is used to isolate a worker from direct exposure to workplace hazards. Examples of PPE include the following:
 - a. Protective clothing
 - b. Gloves
 - c. Eye Protection
 - d. Respirators
 - e. Face Shields

PPE is used in conjunction with engineering and administrative controls for worker protection. It should provide adequate protection if it is properly worn and appropriately used. Prior to usage, consult your online Laboratory Hazard Assessment Tool

(<https://safetyservices.ucdavis.edu/units/ehs/research/laboratory/lhat>) or EH&S (752-1493) to ensure proper PPE selection.

2. Guidelines for PPE Usage

- a. PPE protects differently for each hazard. It does not provide protection against all hazards. Choose appropriate PPE depending on the hazard and task you are performing. Remember: USING THE WRONG PPE MAY BE AS BAD AS USING NO PPE!
- b. PPE does not eliminate the hazard. Know the limitations of PPE. Follow SAFETY PRECAUTIONS while working.
- c. Use and maintain PPE properly to ensure its performance. Having safety goggles does no good if it's resting on your head.
- d. Be aware that there may be hazards with using PPE. Talk to your supervisor or EH&S before using PPE.
- e. PPE does not protect workers the same way! PPE should be properly sized and fitted to ensure its adequacy.
- f. Wear more than the minimum PPE.
- g. Leave your uniform at work and have it laundered there if a service is provided. If you take your uniform home, then wash it separately to avoid contaminating other clothes.
- h. Take off your jewelry (i.e. rings and watches). This reduces chemical seepage and contact with electrical sources.

3. Protective Clothing

- Lab clothing (i.e. coats and aprons) should be worn in the laboratories in order to keep contaminants from getting onto street clothes.
- Open-toed/open-heeled shoes, sandals or shoes made of woven material should not be worn in the laboratory.
- Shorts, cut-offs and miniskirts are inappropriate.
- Long hair and loose clothing should be constrained.
- Jewelry (i.e. rings, bracelets, and watches) should not be worn in order to prevent chemical seepage under the jewelry, contact with electrical sources, catching on equipment and damage to jewelry itself.

4. Gloves

Appropriate gloves should always be used when working in the lab. Disposable gloves should be discarded after each use and immediately after overt contact with chemical.

5. Eye Protection

Devices to provide appropriate eye protection should be used in the laboratory work area. The type of device used will depend upon the hazard presented by the operation and/or chemical in use. Splash goggles (vented or non-vented) are most appropriate when working with liquid chemicals.

6. Respiratory Protection

At times, masks or respirators may be required for some procedures where there may be a potential for inhalation exposure. However, respirator users should consult EH&S to assure accordance with the UCD Respiratory Protection Program.

F. Chemical Hygiene Plan (CHP)

The CHP is designed to protect you from the health hazards associated with hazardous chemicals in your lab. The CHP outlines standard operating procedures for all work involving hazardous substances in your lab. The CHP must be available to employees in the lab at all times.

G. Chemical Storage

1. Chemical Storage

- Separate incompatible chemicals. Check the shelf life of your chemical inventory periodically.
- Store chemicals properly in the cabinets or on the shelves provided.
- Do not store chemicals in fume hoods.
- Install smoke and heat detectors and fire extinguishers.
- Do not overcrowd or overload shelves.
- Keep storage facilities locked.
- Keep aisles clutter-free and unobstructed.

2. Labeling

Since there is a wide variety of chemicals used in the laboratories, appropriate labeling is extremely important. In order to be able to determine its use, disposal and hazards, the UC Davis Hazardous Communication Program requires chemicals to be properly labeled.

3. Flammable Storage Cabinets

- Flammable cabinets are designed to protect flammable liquids against flash fire; the cabinet should ALWAYS remain closed when not in use.
- Ensure cabinet can contain any spilled flammable liquids to prevent fire spread.
- Cabinet should only accommodate up to 60 gallons of flammable liquids.
- All cabinets should be UL (Underwriter's Laboratory) Approved and labeled "Flammable - Keep Fire Away".

4. Lab Refrigerators

- Use only an EH&S approved "lab safe" refrigerator designed for storing chemicals.
- NEVER store chemicals and food in the same refrigerator.
- If not "lab safe" refrigerator, it MUST be labeled "Caution - Unsafe For Storage Of Flammable Solvents".

5. Special Considerations

- Store carcinogens separately.
- Store water-sensitive chemicals and concentrated acids separately.
- Use heat-resistant cabinets for flammable liquids.
- Wooden cabinets are acceptable for solids.
- Peroxide forming chemicals deserve special consideration. Due to unusual stability problems, careful records of the storage history of compounds that form peroxides on standing should be maintained and periodically reviewed. Discard peroxide forming chemicals by the manufacturer's

expiration date or after 6 months of opening, whichever is sooner.

H. Chemical Waste**1. Hazardous Waste Storage**

- All waste must be segregated into categories and stored to prevent incompatible mixtures within or among individual containers.
- Waste must be kept in leak-proof containers with adequate secondary containment in case of breakage or spillage.
- Waste storage area must be inspected at least weekly.
- All waste containers must be labeled as required by UC Davis - Hazardous Waste Management Program.

2. Disposal of Hazardous Waste

Hazardous waste, whether chemical, radioactive or biohazardous, should be labeled and disposed of in accordance with UC Davis - Hazardous Waste Management Program. Hazardous waste labels and pickup requests can be made through the UCD WASTE system:

<https://safetyervices.ucdavis.edu/units/ehs/hazardous-materials-management/waste-tracking> Call EH&S (530-752-1493) for further information or assistance.

Chemical Safety: Ten Basic Rules

1. Know the hazards of chemicals in use.
2. Label all chemicals & their waste properly.
3. Use PPE while handling hazardous chemicals.
4. Work with volatile & hazardous chemicals in a fume hood.
5. Store flammables properly.
6. Do not work alone with hazardous chemicals.
7. Maintain clear access to exits, showers & eyewashes
8. Keep work areas free to clutter.
9. Wash promptly when chemical contacts skin.
10. Do not eat, drink, and apply cosmetics in lab.

Physical Hazards -Recognition, Evaluation and Control

1. RECOGNITION OF PHYSICAL HAZARDS

There is a lot more to laboratory safety than protecting yourself from chemical hazards. Physical hazards are the most common hazard in labs and in any work place. Physical hazards are often related to the release of stored energy, i.e. the energy stored in a pressure or vacuum vessel, electrical energy or the energy in moving mechanical parts.

Physical hazards include but are not limited to:

- compressed gases
- vacuum operations
- distillations/extractions
- electrical
- machinery equipment
- centrifuges
- research animals
- glassware
- oil and sand baths

2. EVALUATION OF PHYSICAL HAZARDS - "Examples"

A. Compressed Gases

The following safety precautions should be taken for all types of cylinder usage.

- Be sure the contents are marked on the cylinder; never use cylinder paint colors as an indicator.
- Storage areas must be well ventilated.
- Keep the main cylinder valves closed when not in use.
- The valve-protection cap should always be kept on until the cylinder is ready for use.
- Always transport cylinders using a suitable hand truck with a tie-down chain; NEVER roll, pull, or drag cylinders.
- Always double chain compressed gas cylinders separately to the wall to prevent falls.
- Wear appropriate personal protective equipment (PPE), such as safety goggles or face shield, gloves and steel-toed safety shoes, as necessary.
- Clearly mark "EMPTY" cylinders and store separately from full ones.
- Always use pressure-reducing regulators.
- Install shut-off valves and check valves. Assure flashback arrestor is used for flammable gases.
- Do not allow grease or oil on oxygen regulators.
- Store flammables and oxidizers apart by at least 20 feet or separated by a wall.
- Always wear safety glasses when handling tubing on compressed gases.
- Gas cabinets: These cabinets offer added protection from toxic, flammable and corrosive gases by enclosing the cylinder(s) in a cabinet, which is equipped with an exhaust system located at the top of the cabinet.
 - ✓ Should have perforated plate floor air inlet to ensure complete air distribution throughout the cabinet.
 - ✓ Should have a smooth top-to-stack transition at the top of the cabinet exhaust area to prevent possible air channeling.

1. Cryogenic Liquids and solids

- Avoid skin contact, and clothing like knitted mitts that can trap spilled liquid. Use only well insulated gloves designed for the handling of super cold materials.

- Be alert for the condensation and displacement of oxygen from air.
 - Use in a well ventilated area.
 - Use eye protection.
 - Do not use standard "thermos" bottles. Use high quality Dewars wrapped with cloth backed tape, like duct tape, to contain flying pieces in event of an implosion.
2. Highly Toxic Gases (i.e. fluorine, ETO, and arsine)
 - Always handle in a well-ventilated area such as inside a chemical fume hood or gas cabinet.
 - Should a leak be detected, leave the cylinder inside a fume hood, close the sash, evacuate the area immediately, and report to EH&S office.
 - NEVER attempt to move any leaking cylinder.
 3. Corrosive Gases
 - Stored for the shortest possible periods before use, preferably less than 6 months.
 - Storage area should be dry as possible.
 - Do not store near instruments or devices sensitive to corrosion.
 4. Acetylene
 - Acetylene forms explosive compounds with copper, silver, and mercury.
 - Avoid contact with these metals or their salts.
 - Never exceed the pressure limit indicated by the warning red line of an acetylene pressure gauge.
 - Ensure outlet line of the cylinder is protected with a flash arrestor.
 - Do not use a cylinder that has been stored in a non-upright position until it has remained in an upright position for at least 30 minutes.

Please refer to SafetyNets #509 (<https://safetyservices.ucdavis.edu/safetynet/compressed-gas-cylinders>) and #60 (<https://safetyucd.sf.ucdavis.edu/safetynet/compressed-gas-safety>) for further information.

B. Vacuum Operations

An operation involving an evacuated system where there exists a higher pressure on the outside rather than on the inside. These operations must be regarded as having an implosion hazard, which may result in flying glass, spattered chemicals and possibly fire.

- Always wear eye and/or face protection (i.e. face shields, safety goggles).
- Check all glass vessels and equipment for visible defects and ensure that they are specifically designed for such operations.
- Use glassware specially designed with heavy walls.

1. Vacuum Desiccators

- Should be enclosed in a shield or wrapped with friction tape (i.e. vinyl electrical tape).
- Whenever possible, use plastic desiccators (i.e. polycarbonate).

2. Vacuum Pumps

- Use a cold trap to protect the pump oil from getting contaminated with volatile substances.
- The output of each pump should be vented to an exhaust hood.

C. Electrical Safety

Shock injuries are caused by the flow of electric current (amperage), not the voltage (i.e. 60/100 of an ampere, just enough to light an ordinary Christmas tree light, may kill if it passes through the chest).

- Grounding should be provided for all electrical equipment, machinery, portable tools, extension cords and other electrical systems; grounding provides a safe path for electricity to the ground, preventing leakage of current in circuits or equipment.
- Maintain three-foot clearance around electrical switches and panels.
- All electrical equipment must have UL approval.
- Inspect all equipment periodically for defects or damage.
- Maintain all equipment in proper operating condition; see that necessary repairs are carried out.
- Be sure to de-energize all electrical equipment before inspecting or making repairs. (Call EH&S at 752-1493 for Lockout/Tagout procedures).
- Do not overload circuits and wiring.
- All cords that are worn, frayed, abraded, corroded or otherwise damaged must be replaced.
- Do not yank cords to disconnect them; keep all cords away from heat, oil and sharp edges.
- Ensure live parts of electrical equipment operating at 50 volts or more is guarded against accidental contact.
- Be sure that ground-fault circuit interrupters (GFCI) are used in high-risk areas such as wet locations (GFCI's are designed to shut off electrical power within as little as 1/40 of a second).

D. Machinery Equipment

Examples: Rotating equipment or apparatus that can trap clothing, hair, or body parts; vacuum pumps, centrifuges, mechanical stirrers and rotary evaporators; hazardous grinding, drilling, and cutting equipment in shops.

- Do not use a piece of equipment until you are instructed in its proper use.
- Do not remove guards or safety interlocks devices.
- Use the appropriate personal protective devices: glasses, gloves, goggles or face shield.

Please see Safety Net # 115 for further information:

<https://safetyservices.ucdavis.edu/safetynet/machine-guarding>

E. Research Animals

- Keep cages clean and rooms well ventilated.
- Maintain a high standard of personal hygiene.
- Wear gloves to avoid diseases and to protect against bites.
- Follow guidelines for animal handling in "Guide to the Care and Use of Laboratory Animals", NIH (National Institute of Health) No. 78-23 (1978).
- Follow UCI Animal Research Committee Policy and Procedures for handling animals.

Please see the UCD IACUC website for further information:

<https://research.ucdavis.edu/policiescompliance/animal-care-use/iacuc/>

F. Glassware Safety

- Inspect glassware for cracks and defects before using.
- For heating and pressurize operations, ensure that appropriate glass is used. Borosilicate glassware is recommended for all laboratory glassware except for special experiments that use UV or other light sources.
 1. Cutting glass
 - Place tubing on a hard surface and nick glass surface with a triangular file.
 - Always wrap the glass tubing in a cloth before attempting to break it.
 - If the tubing doesn't easily break, the nick is too shallow; try again.
 2. Broken glass
 - Clean all broken glass using a broom and pan; do not pick up broken glass with your hands.
 - Dispose of broken glass properly in a plastic lined, hard-walled container and label "Broken Glass".
 - Contaminated glass must be placed in appropriate durable chemical waste container.

G. Oils and Sand Baths

- Avoid spilling water and other volatile substances.
- Silicone oil should be used for temperatures.
- Oil baths left unattended should be fitted with thermal sensing devices that will turn off the electric power of the bath overheats.
- Care must be taken to keep salt baths dry because they are hygroscopic.

H. Distillations and Extractions

1. Distillations
 - Do not distill or evaporate organic solvents to dryness unless they are known to be free of peroxides
2. Extractions
 - Do not attempt any extraction until the solution is cooler than the boiling point of the extractant.
 - Do not vent the separatory funnel near a flame or other ignition source.

I. Centrifuges

Centrifuging presents the possibility of two serious hazards:

- mechanical failure - i.e., broken drive shaft, faulty bearing, disintegrated rotor all these can produce aerosols and hazardous fragments moving at great velocity.
- creation of aerosols.
 1. General Safety Procedures
 - Before centrifuging, inspect tubes for crack, inspect the inside of the trunnion cup for rough walls caused by erosion of adhering matter, and carefully remove bits of glass from the rubber cushion.
 - Screw caps or a cap that fit over the rim outside the centrifuge tube is safer than plug-in closures. Fluid collects between plug-in closure and tube rim.
 - Aluminum foil should not be used to cap centrifuge tubes containing infectious materials because they often become detached or rupture during or centrifuging.

PHYSICAL HAZARDS

- When centrifuging is done in a ventilated glove box, the glove panel should be in place with the glove ports covered. A centrifuge in operation creates a reverse air currents that may cause escape of agent from an open cabinet.
 - For flammable/highly hazardous materials, the centrifuge should be under negative pressure to a suitable exhaust system.
2. Centrifuge and Biohazardous Material
- When used with biohazardous materials, centrifuge tubes, rotors, and accessories should be filled and opened in a biological safety cabinet (BSC).
 - If centrifuging of biohazardous material is to be performed outside a containment cabinet, a sealed safety bucket/tube should be used.
 - After safety bucket/tube is filled and sealed, it should be considered contaminated and wiped with cloth soaked in disinfectant. (Some disinfectants are corrosive to centrifuge rotors/buckets, rinse with water after appropriate contact time elapsed.)
 - Minimize the amount of aerosol created by using a swirling, rotary motion rather than shaking to resuspend sediment after centrifuging.
 - Avoid decanting centrifuge tubes. If you must do so, wipe outer rim with a disinfectant; otherwise, the infectious fluid will spin off as an aerosol.
 - Avoid filling the tube to the point that the rim outside becomes wet with culture.
3. Low Speed/Small Portable Centrifuges (centrifuges that do not have aerosol- tight chambers)
- Outside of bucket should be decontaminated before bucket is removed for centrifuging.
 - Bucket should be returned or opened in a BSC.
 - Small centrifuge could be placed in BSC.
4. High Speed Centrifuges (chamber is connected to a vacuum pump)
- Filter should be placed between chamber and pump.
 - Prone to metal fatigue, therefor keep a record of use, one record for each rotor and an instrument log.
 - To prevent corrosion or other damage, conduct frequent inspections, proper cleaning, and timely drying of rotors.
 - Rubber "O" rings and tube closures must be examined for deterioration and coated with a lubricant recommended by manufacturer.
5. Continuous Flow Centrifuges (allow continuous harvesting of product while centrifuge operates at full speed) and Zonal Centrifuges (separates product according to its density or buoyancy under centrifugal force).
- Enclose in especially designed ventilated safety cabinet.
 - Conditions that can lead to production of aerosols during zonal centrifuging:
 - leaky rotor seals due to nicks, damage to seals, improper assembly and over-pressurization.
 - drops of culture in chamber or on rotor.
 - snagging tubing or tubing connections
 - disassembly or decontamination.

3. CONTROL METHODS FOR PHYSICAL HAZARDS

Many control methods outlined for chemical hazards can also be applied for physical hazards. These methods include designated area, engineering controls (i.e. gas cabinets, fume hoods), work practice controls, PPE, and SOP's (Standard Operating Procedures).

Sources:

Prudent Practices in the Laboratory - Handling and Disposal, National Academy of Sciences, 1995.

Safety in Academic Chemistry Laboratories, American Chemical Society, Wash. DC, 1990

Handbook of Compressed Gases, Compressed Gas Association, Inc. 2nd Ed., Van Nostrand Reinhold Company, 1981

Safety in Academic Chemistry Laboratories, American Chemical Society, Washington D.C., 1990

Radiation Hazards - Recognition, Evaluation & Control

1. IONIZING RADIATION

A. RECOGNITION OF IONIZING RADIATION HAZARDS

Ionizing radiation is radiation, which interacts with matter to form ions; high-energy electromagnetic radiation and particle radiation are capable of producing ions in their passage through matter. Types of ionizing radiation include alpha and beta particles, x-rays, gamma rays, etc.

B. EVALUATION OF IONIZING RADIATION HAZARDS

1. Sources of Ionizing Radiation: Radioisotopes
2. Commonly used radioisotopes on campus include P-32, S-35, C-14, H-3 & I-125. They are most often used for tracing biological processes.
3. X-ray machines: These are used for geological, metallurgical and material science analyses, and occasionally for irradiation of biological samples and x-ray crystallography.

C. CONTROL METHODS FOR IONIZING RADIATION

In order to keep exposures to ionizing radiation as low as possible, there is a system at UC Davis to safely use radioisotopes and radiation-producing machines. Radiation users should refer to the UC Davis Radiation Safety Manual.

1. Work/Storage Area Identification
Each entrance to an area where an ionizing radiation source is being used or stored must be posted with an appropriate warning sign which includes the radioactive material/radiation trifoil symbol.
2. Working with Ionizing Radiation Sources
It is important to understand the type (i.e., gamma, beta, alpha, x-ray) and energy of the radiation emitted by the source you are working with; this determines the handling procedures, shielding and monitoring equipment to be used.
 - Those working with ionizing radiation must be trained in radiation safety; initial training sessions, are given monthly at EH&S. Protection Section of EH&S.
 - PI's using radioactive materials must be issued Radiation Use Authorizations (RUAs). All users must be listed on the RUA. The RUA indicates the amounts and types of radioactive materials and/or radiation-producing machines being used, by whom, where, how and with what precautions.
 - More hazardous or delicate procedures should be handled by more experienced personnel (i.e., pipetting stock solutions or aligning x-ray machines).
 - Regular testing for radioactive contamination must be conducted.
 - Users may receive a dosimeter badge or ring to monitor radiation exposure, if deemed necessary by EH&S.
 - All appropriate lab personnel must be informed of the potential hazards and safety procedures involved in the use of radiation sources, including:
 - ✓ the nature of the radiation hazard, and the properties of other materials

- being used which could affect exposure.
- ✓ radiation detection instrumentation, and how to use it.
- ✓ preventing exposure (shielding, remote handling tools, dry runs, contamination control, protective clothing).
- ✓ appropriate waste disposal practices.
- ✓ general lab safety; housekeeping.
- ✓ emergency guidelines.
- Refer to the UC Davis Radiation Safety Manual, laboratory protocol, supervising professor or EH&S, if unsure of any of the above.

2. NON-IONIZING RADIATION

A. RECOGNITION OF NON-IONIZING RADIATION HAZARDS

Non-ionizing radiation is electromagnetic radiation that is not of sufficient energy to ionize matter, though it is capable of damaging the human body. Non-ionizing radiation can cause photochemical and thermal effects by exciting electrons in atoms to higher energy levels, and by producing molecular excitation. Lasers, radio-frequency and microwave radiation, IR radiation, and UV radiation are all examples of non-ionizing radiation.

B. EVALUATION OF NON-IONIZING RADIATION HAZARDS

1. Sources of Non-Ionizing Radiation

- UV Radiation

Chronic exposure to UV radiation may cause premature skin aging, excessive wrinkling of the skin, skin cancer, and cataracts (opacities in the lens of the eyes).

- i. UV-A (315 - 400 nm) - "Black Light". Effects include tanning (and some burning) of the skin, and fluorescing of ocular media (corneal and lens effects).
- ii. UV-B (280 - 315 nm) - "Erythematous UV". Effects include "sunburn" of the skin, inflammation of the cornea of eye, and cataracts.
- iii. UV-C (100 - 280 nm) - "Germicidal UV". Principal effect is inflammation of the cornea of the eye.

- IR Radiation

- i. IR-A (700 nm - 1.4 mm) - "Near IR". High intensity may cause skin burns and retinal thermal injury.
- ii. IR-B (1.4 - 3.0 mm) and IR-C (3.0 mm - 1 mm) - "Far IR". High intensity may cause skin burns and corneal inflammation.

- Radio-frequency (RF) and Microwave (MW) Radiation

- i. RF (0.3 - 30 MHz) and MW (30 MHz - 300 GHz) - Effects may include formation of cataracts, neurological effects, male sterility and possibly cancer

- Laser Radiation ("Light Amplification by Stimulated Emission of Radiation")

- i. Lasers may emit UV, visible or IR radiation.
- ii. Laser radiation has unique properties: monochromatic (one wavelength emitted), coherent (all waves in phase), highly directional (low beam spreading), high energy density.

- iii. Additional laser hazards
 - ✓ Electrical - most lethal hazard! Only qualified individuals may perform laser power supply service or maintenance.
 - ✓ Chemical - dyes in liquid laser media, toxic gases.
 - ✓ X-radiation - from high voltage vacuum tubes.
 - ✓ Fire - Class 4 laser beam (generally IR laser).
 - ✓ Mechanical - ergonomic injuries.

C. CONTROL METHODS FOR NON-IONIZING RADIATION

1. UV Radiation

Eye protection (goggles, safety glasses, face shields) and protective clothing should be worn when working with high-level UV sources, which should be enclosed or shielded to prevent exposures. When fully enclosed and interlocked UV sources are used, protective eye-wear and clothing are not needed.

2. IR Radiation

Same as for UV (eye and skin protection). Measures to avoid hyperthermia (overheating of the body) may be needed

3. Radio-frequency (RF) and Microwave (MW)

Radiation Sources must be properly isolated and shielded

4. Laser Radiation

Lasers are classified Class 1-4, depending upon their capacity to produce injury. Each class is governed by specific regulations regarding engineering, administrative and personal protection control measures:

- Class 1 (exempt laser) - i.e., laser in CD player
 - ✓ laser should be labeled.
 - ✓ laser must be enclosed and interlocked (for fully-enclosed Class 3b or 4 laser).
- Class 2 (low power laser) - i.e., bar code scanner
 - ✓ laser must be properly labeled.
 - ✓ do not stare into the beam!
- Class 3a (medium power laser) - i.e., laser pointer
 - ✓ laser must be properly labeled and area sign ("Caution") should be posted in some cases.
 - ✓ do not stare into beam or view directly with optical instruments.
 - ✓ eye protection may be needed in rare circumstances.
- Class 3b (medium power laser) - i.e., some research lasers
 - ✓ laser must be properly labeled and area sign ("Danger") must be posted.
 - ✓ laser operators must be adequately trained (including laser safety).
 - ✓ written operational safety procedure is highly recommended.
 - ✓ many engineering controls are required (keyed master switch, beam stops, laser interlocks, etc.).
 - ✓ laser controlled area must be established.
- Class 4 (high power laser) - i.e., most medical & research lasers
 - ✓ all measures listed above for Class 3b lasers.
 - ✓ avoid eye or skin exposure to direct or scattered (specular and diffuse)

- radiation.
- ✓ eye protection (and occasionally skin protection) is essential.
 - ✓ activation warning systems (alarms, lights) must be installed in most cases.
5. Ten Most Common Causes of Laser-Produced Eye Injuries
- Unanticipated eye exposure during alignment.
 - Fatigue, leading to carelessness or inappropriate shortcuts; horseplay.
 - Misaligned optics, upward directed beams, or beams at eye-level.
 - Available eye protection not worn, or the wrong eyewear worn.
 - Overconfidence; feeling of complacency or invincibility.
 - Equipment malfunction.
 - Operator unfamiliar with laser equipment (not sufficiently trained).
 - Improper restoration of equipment following service.
 - Failure to follow standard operating procedures due to rushing, etc.
 - Manufacturer-installed safety features by-passed.

Please review the UCD Radiological Safety website for further information:

<https://safetyservices.ucdavis.edu/units/ehs/research/radiological>

DEPARTMENT	DEPARTMENT LOCATION(S)	DEPARTMENT CHAIR	CAO
Anesthesiology & Pain Medicine	Sac: 1200 PSSB; 916-734-5031 https://health.ucdavis.edu/anesthesiology/	Richard Applegate II	Aretha Gillis
Biological Chemistry & Molecular Medicine	Sac: 2700 Stockton Blvd, Suite 2102; 916-734-4417 https://health.ucdavis.edu/biochem/	Luis Fernando Santana (interim)	Adriane Joo
Cell Biology & Human Anatomy	Davis: 4303 Tupper Hall; 530-752-4328 https://health.ucdavis.edu/cellbio/	Paul Fitzgerald	Jennifer Rossi
Dermatology	Sac: 3301 C Street, Suite 1400; 916-734-6111 https://health.ucdavis.edu/dermatology/	Samuel Hwang	Benson Won
Emergency Medicine	Sac: 2100 PSSB; 916-734-5010 https://health.ucdavis.edu/emergency/	Nathan Kuppermann	Jennifer Wyatt
Family and Community Medicine	Sac: 2300 Ambulatory Care; 916-734-2820 https://health.ucdavis.edu/famcommed/	Anthony Jerant	Sherri Stone (interim)
Internal Medicine	Sac: 3100 PSSB; 916-734-2812 https://health.ucdavis.edu/internalmedicine/	Timothy Albertson	Lisa Pastore-Anderson
Medical Microbiology & Immunology	Davis: 3146 Tupper Hall; 530-752-9402 https://health.ucdavis.edu/medmicro/	Satya Dandekar	Kathy Blaisdell
Neurological Surgery	Sac: 3740 Ambulatory Care; 916-734-3658 https://health.ucdavis.edu/neurosurg/	Kia Shahlaie (interim)	Stacy Miller
Neurology	Sac: 3700 Ambulatory Care; 916-734-3588 https://health.ucdavis.edu/neurology/	Amy Brooks-Kayal	Stacy Miller
Obstetrics & Gynecology	Sac: 2500 Ambulatory Care; 916-734-6900 https://health.ucdavis.edu/obgyn/	Gary Leiserowitz	Sherri Stone
Ophthalmology/Eye Center	Sac: 2400 Ambulatory Care; 916-734-6602 https://health.ucdavis.edu/eyecenter/	Mark Mannis	Cameron Blount
Orthopaedic Surgery	Sac: 3860 Ambulatory Care; 916-734-2700 https://health.ucdavis.edu/orthopaedics/	R. Lor Randall	Joseph MacDonald
Otolaryngology	Sac: 7200 Glassrock; 916-734-2801 https://health.ucdavis.edu/otolaryngology/	Arnaud Bewley (interim)	Erin M Hubbard
Pathology & Laboratory Medicine	Sac: 4400 V Street; 916-734-2525 https://health.ucdavis.edu/pathology/	Lydia Howell	Carlos C. Garcia
Pediatrics	Sac: Ticon II; 916-734-3112 https://health.ucdavis.edu/pediatrics/	Satyan Lakshminrusimha	Janette Lee
Pharmacology	Davis: 3503 GBSF; 530-752-3200 https://health.ucdavis.edu/pharmacology/	Donald Bers	Laila Adora
Physical Medicine & Rehabilitation	Sac: 4860 Y Street, Ste.3850 ACC-Ellison Bldg; 916-734-5291 https://health.ucdavis.edu/pmr/	Craig McDonald	Joseph MacDonald
Physiology & Membrane Biology	Davis: 4303 Tupper Hall; 530-752-9879 https://health.ucdavis.edu/physiology/	Luis Fernando Santana	Jennifer Rossi
Psychiatry & Behavioral Sciences	Sac: 2230 Stockton Blvd; 916-734-3574 https://health.ucdavis.edu/psychiatry/	Helen C. Kales	Jerry Elder
Public Health Sciences	Davis: MS1-C; 530-752-2793 https://health.ucdavis.edu/phs/	Bradley Pollock	Eric Sommers
Radiation Oncology	Sac: Suite G-140 Cancer Center; 916-734-5810 https://health.ucdavis.edu/radonc/	Richard Valicenti	Jennifer Kellogg
Radiology	Sac: 3100 Ambulatory Care; 916-703-2108 https://health.ucdavis.edu/radiology/	Elizabeth Morris	Jennifer Kellogg
Surgery	Sac: Cypress Building; 916-734-3528 https://health.ucdavis.edu/surgery/	Diana Farmer	Racheal McGaha
Urological Surgery	Sac: 2200 Ambulatory Care; 916-734-2222 https://health.ucdavis.edu/urology/	Christopher Evans	Michelle Chang

INTERNAL MEDICINE DIVISION(S)	DIVISION LOCATION(S)	DIVISION CHIEF	DIVISION MANAGER/ADMIN	
Cardiovascular Medicine	Sac: 2820 Ambulatory Care; 916-734-3761 https://health.ucdavis.edu/internalmedicine/cardio/	Thomas WR Smith	Jaskaran Birak	
Endocrinology, Diabetes & Metabolism	Sac: 4150 V Street, Suite G400; 916-734-2737 https://health.ucdavis.edu/internalmedicine/endocrinology/	Sidika Karakas	Marie "Connie" Peters	
Gastroenterology & Hepatology	Sac: 3500 PSSB; 916-734-3751 https://health.ucdavis.edu/internalmedicine/gastro/index.html	Christopher Bowlus	Maria Hayes	
General Medicine	Sac: 2400 PSSB; 916-734-7005 https://health.ucdavis.edu/internalmedicine/general/	Shin-Ping Tu	Brenda Lavell	
Hematology & Oncology	Sac: Suite 3016 Cancer Center; 916-734-3771 https://health.ucdavis.edu/internalmedicine/hemonc/	Ted Wun	Mary Kilpatrick	
Infectious & Immunologic Diseases	Sac: G500 PSSB; 916-734-3815 https://health.ucdavis.edu/internalmedicine/infectious/index.html	Stuart Cohen	Kaitlyn Kirk	
Nephrology	Sac: 3500 PSSB; 916-734-3774 https://health.ucdavis.edu/internalmedicine/nephrology/index.html	Burl Don	Marie "Connie" Peters	
Pulmonary, Critical Care and Sleep Medicine	Sac: 3400 PSSB; 916-734-3564 https://health.ucdavis.edu/internalmedicine/pulmonary/	Nicholas Kenyon	Robert Rawlings	
Rheumatology, Allergy & Clinical Immunology	Davis: 6310 GBSF; 530-752-2884 https://health.ucdavis.edu/internalmedicine/rheumatology/	William Ridgway	Kaitlyn Kirk	
Transplant Nephrology	Sac: 2233 Stockton Blvd; 916-734-1516 https://health.ucdavis.edu/internalmedicine/transplant/	Yihung "Eric" Huang (interim)	Marie "Connie" Peters	
CENTER(S)	CENTER LOCATION(S)	CENTER DIRECTOR	CENTER MANAGER	
Alzheimer's Disease Center	Sac: 3900 Ambulatory Care; 916-734-5496 https://health.ucdavis.edu/alzheimers/	Charles DeCarli	Jayne LaGrande	SOM
Behavioral Health Center for Excellence	Sac: 4701 X Street, Suite 1320; 916-734-3230 https://behavioralhealth.ucdavis.edu/	Cameron Carter	Malena B Teeters	SOM
California National Primate Research Center	Davis: Hutchison Dr./County Rd 98; 530-752-0447 http://www.cnprc.ucdavis.edu/	John Morrison Jeffrey Roberts	Annmarie Boylan	OVCR
Cancer Center	Sac: 4501 x Street, Suite 3003; South Bldg 916-734-5959 https://health.ucdavis.edu/cancer/	Primo Lara, Jr. John McPherson	Gina Dayton	OVCR
Center for Advancing Pain Relief	Sac: 4860 Y Street; 916-734-7246 https://health.ucdavis.edu/pain/	Scott Fishman	Fahn Saechao	SOM
Center for Health & Technology	Sac: 4610 X Street, Suite 2301; 916-734-5675 https://health.ucdavis.edu/cht/	James Marcin	Shelley Palumbo	SOM
Center for Health & The Environment	Davis: Bldg 3792, rm 129 Old Davis Road; 530-752-1340 https://che.ucdavis.edu/	Kent Pinkerton	Sherri Gallagher	OVCR
Center for Healthcare Policy & Research	Sac: 2103 Stockton Blvd; 916-734-2818 https://health.ucdavis.edu/chpr/	Interim: Anthony Jerant	Monica Steinhart	OVCR
Center for Immunology & Infectious Diseases (formerly known as Center for Comparative Medicine)	Davis: Hutchison Dr./County Rd 98; 530-752-7913 https://ccmmain.sf.ucdavis.edu/	Stephan J. McSorley	Christine Herkenrath	
Center for Musculoskeletal Health	Sac: 4625 2nd Avenue, suite 2000; 916-723-4534 https://health.ucdavis.edu/musculoskeletalhealth/	Nancy Lane	Elizabeth Lincoln	SOM
Center for Neuroscience	Davis: 1544 Newton Ct; 530-757-8708 https://neuroscience.ucdavis.edu/	Kimberley McAllister	Madhu Sharma	CBS
Center for Precision Medicine	Sac: 4610 X Street, Suite 3124, Sacramento, CA 95817 https://health.ucdavis.edu/precision-medicine/index.html	Frederick Meyers	Christopher Wang	SOM
Center for Reducing Health Disparities	Sac: 2921 Stockton Blvd, CTSC Bldg, Suite 1408; 916-703-9211	Sergio Aguilar-Gaxiola	Andrea C. Nunez	SOM

	https://health.ucdavis.edu/crhd/			
Center for Simulation and Education (formerly known as Center for Virtual Care)	Sac: 4610 X Street, room 3301; 916-734-4708 https://health.ucdavis.edu/simulation/	Ian Julie		SOM
Center for Vision Science	Davis: 4303 Tupper Hall https://basicscience.ucdmc.ucdavis.edu/cvs/index.html	Paul Fitzgerald	Jennifer L Rossi / Amanda C Fl	SOM
Clinical & Translational Science Center	Sac: 2921 Stockton Blvd. Suite 1400 https://health.ucdavis.edu/ctsc/	Ted Wun	Vincetta (Kitty) Lombardo	SOM
Imaging Research Center	Sac: 4701 X Street https://health.ucdavis.edu/irc/	Cameron Carter	Jessica Hicks	SOM
Institute for Regenerative Cure	Sac: 2315 Stockton Blvd. https://health.ucdavis.edu/stemcellresearch/	Jan Nolta	Delia Roberts	SOM
MIND Institute	Sac: 2825 50th Street https://health.ucdavis.edu/mindinstitute/	Leonard Abbeduto	Michele Ono	SOM
UCD Firefighters Burn Institute Regional Burn	Sac: 4251 X Street, Sacramento, CA https://health.ucdavis.edu/burncenter/	Tina Palmieri		SOM
Vascular Center	Sac: 4860 Y Street ACC. #3400 https://health.ucdavis.edu/vascular/	Matthew Mell	Tom Nguyen	SOM
SCHOOL OF NURSING	EXECUTIVE MANAGEMENT	LOCATION		
Dean for School of Nursing	Stephen J. Cavanagh	Sac: 2570 48th St, Ste 2400	Stacey Pasco ?	
Executive Associate Dean	Holly Evans			
Associate Dean for Research	Janice F. Bell			
Associate Dean for Student & Faculty	Elizabeth Rice			
Assistant Dean for Education	Lisa Badovinac			
Assistant Dean for Interprofessional	Jana Katz-Bell			
Assistant Dean for Administration	Emily Sanson-Smith			
Assistant Dean for Advancement	Sallie-Grace Tate			
Chief PCS Officer	Carol Robinson			
	https://health.ucdavis.edu/nursing/			
OTHER DEPARTMENT(S)	DEPARTMENT LOCATION(S)	DEPARTMENT CHAIR	MANAGER	
Biomedical Engineering	Davis: 2303 GBSF http://bme.ucdavis.edu/	Steven C. George	Megan Villasenor	
Genome Center	Davis: 4310 GBSF http://genomecenter.ucdavis.edu/	Richard Michelmore	Ernie Hofteyzer	