Graduate Student Orientation

Safety Requirements

Christina Hoddle
Laboratory Safety Officer

UC RIVERSIDE UNIVERSITY OF CALIFORNIA

"Safety and Science are NOT separate entities. They are one."

Why is laboratory safety important?

"The facts are unequivocal. Occupational Safety & Health Administration statistics demonstrate that researchers are 11 times more likely to get hurt in an academic lab than in an industrial lab.

There have been serious accidents in academic labs in recent years—including fatalities—that could have been prevented with the proper use of protective equipment and safer laboratory procedures

"The Importance of Teaching Safety," William F. Bandolzer, et al., *Chemical & Engineering News*. Vol. 91, Issue 18. May 6, 2013.

http://cen.acs.org/articles/91/i18/Importance-Teaching-Safety.html

Sheri Sangj- UCLA

12/29/2009- Three months into her job, she was using a plastic syringe to extract a small quantity of t-butyl lithium, as she withdrew the liquid, the syringe came apart in her hands, spewing flaming chemicals. A flash fire set her clothing ablaze and spread second- and third-degree burns over 43% of her body.

Michele Dufault -Yale

04/12/2011 Yale undergraduate majoring in astronomy and physics was killed when her hair became caught in the lathe, whose rotating axis is used to hold materials like wood or metal being shaped.

Preston Brown- Texas Tech

01/07/2010- An explosion severely injured a graduate student at Texas Tech University in Lubbock, Texas, in the chemistry department during the handling of a high-energy metal compound, which suddenly detonated.

Lost three fingers, his hands and face were burned, and one of his eyes was injured

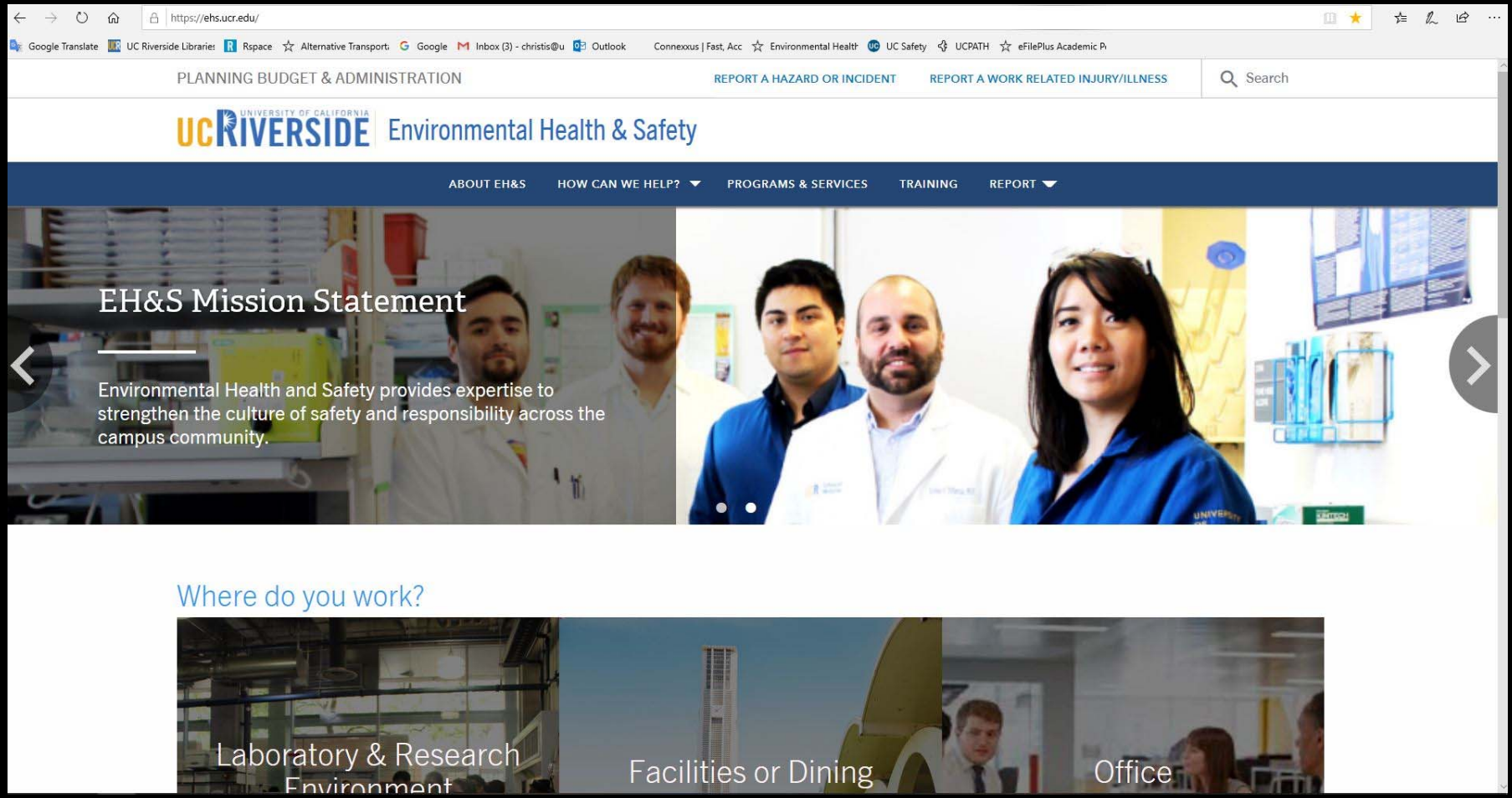
- working with energetic materials in greater quantities than was prudent.
-working outside of a hood and without a blast shield and personal protective wear.

Assignment of Responsibilities

- University of California, its campuses, and units are responsible for having the appropriate programs in place and enforced in order to provide a safe working environment.
- The Principle Investigator is responsible for certifying that his lab is in compliance with all regulations.
- The PI and all lab workers (staff, students, visitors) must sign lab SOPs & acknowledge the contents, the requirements & responsibilities, in that SOP.
- The PI must approve all SOPs (standard operating procedure) and SOP amendments.

Written records are essential!

Campus Resources – ehs.ucr.edu



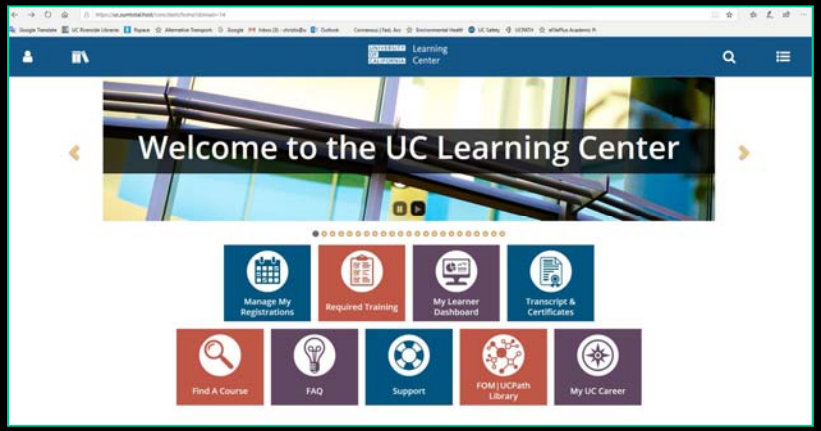
Lab Safety Training

All researchers, including students, are required to COMPLETE their training requirements before they can begin working in a laboratory.

Mandatory Training Requirements*

Laboratory Safety Fundamentals (4hrs 20min) – online
Hazardous Waste Management (32min) – online
Fire Extinguishers (4.5min) -online

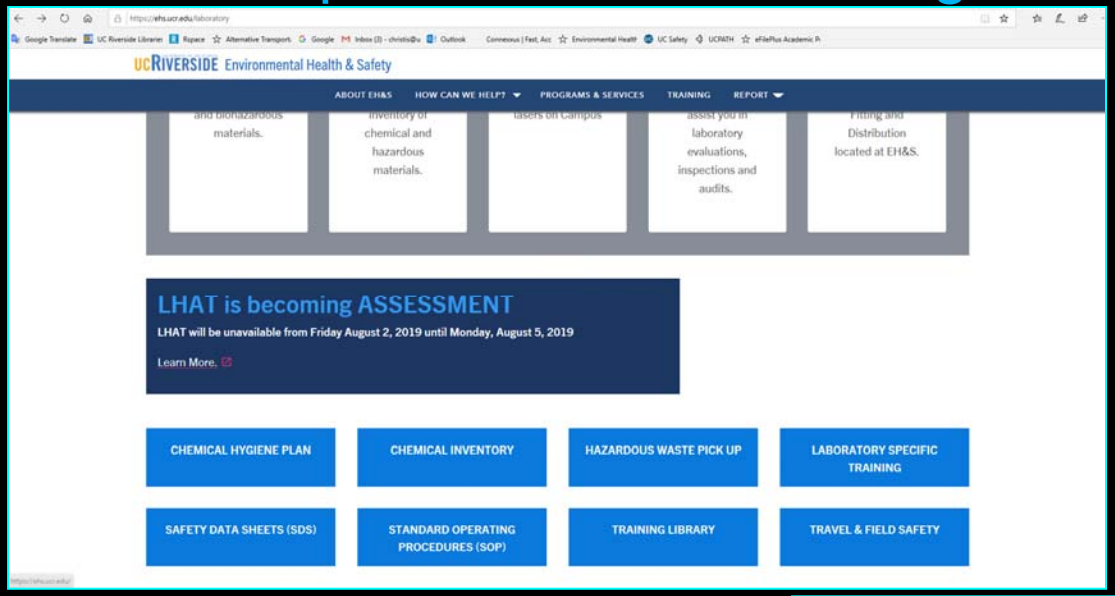
*subject to change

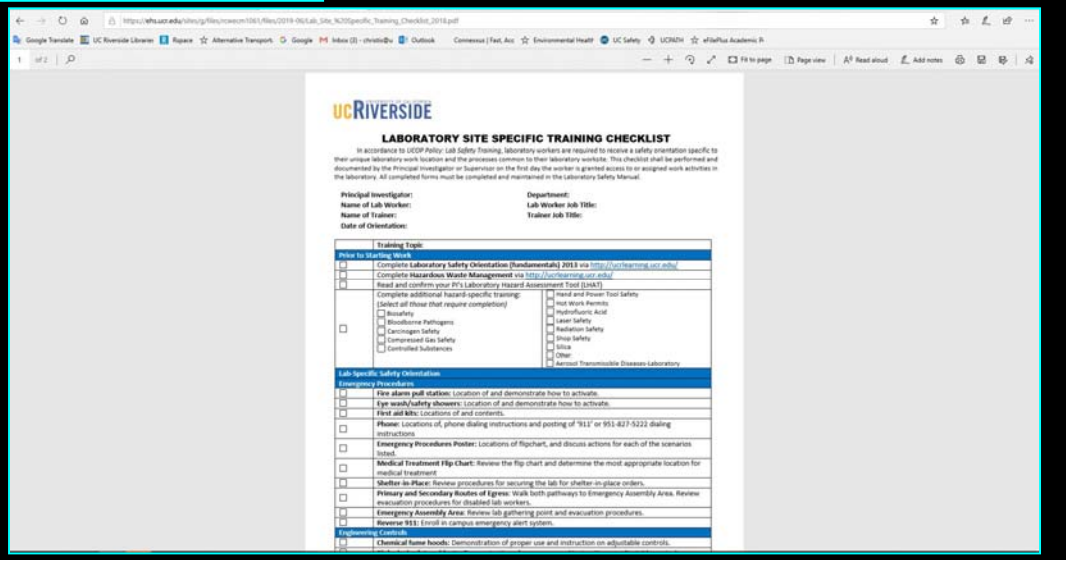


http://ehs.ucr.edu/training/

Lab Safety Training "Other Training"

http://ehs.ucr.edu/training/assessment.html



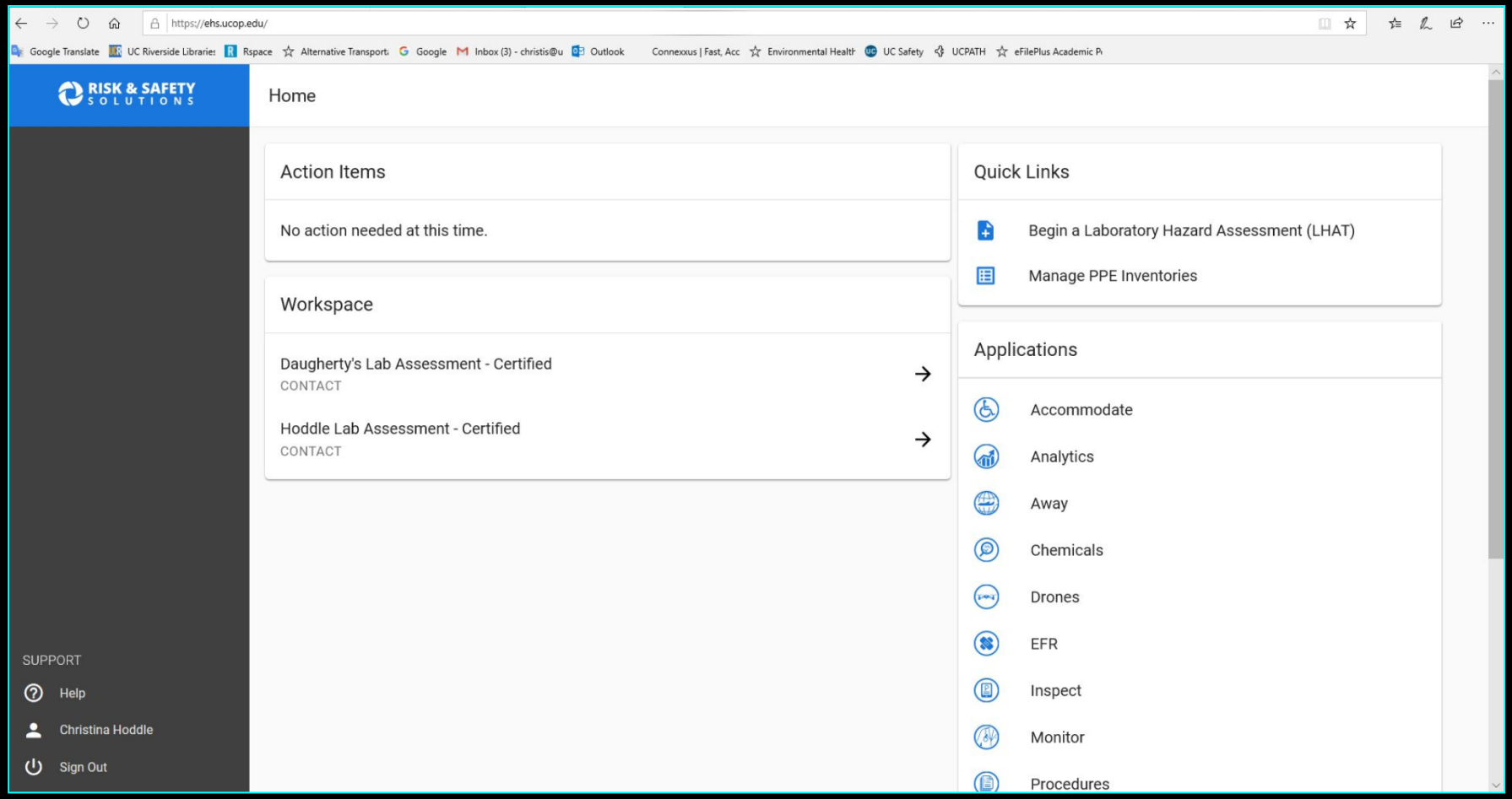


Recommended/required training based on type of laboratory work

1. Biosafety: if working with microbials or molecular techniques.
2. Bloodborne Pathogens – working with potentially infectious tissue, blood etc.
3. Animal Care and Use – any vertebrate animal use
4. Personal Protective Equipment – Chemical and Biosafety
5. Fume Hood Safety
6. Dry Ice Shipping
7. Pesticide Safety
8. Tool Safety – required to work in Entomology Shop (further training within the dept also required, (see Chris Hanlon).
9. Autoclave training – department medical autoclave (Imad Bayoun)
10. Radiation Safety

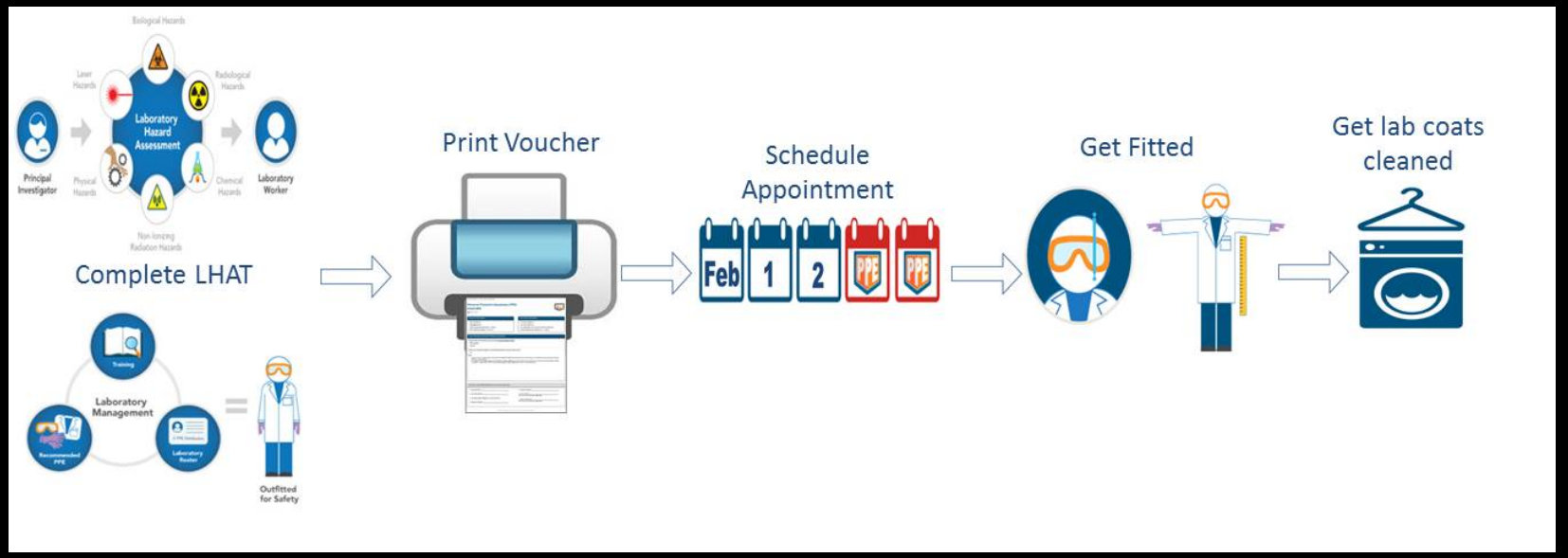
UC SAFETY DASHBOARD

https://ehs.ucop.edu



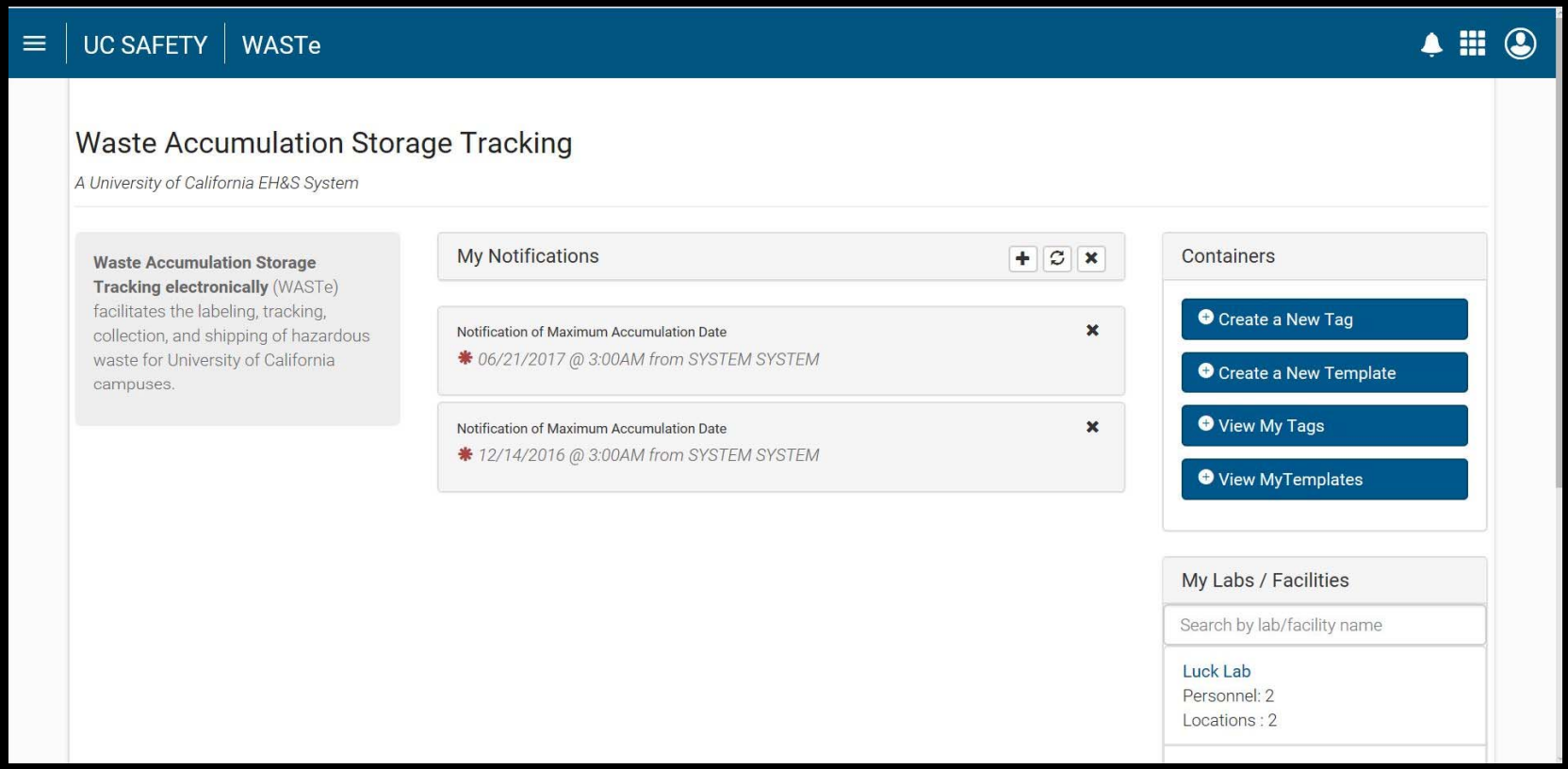
LHAT
(Laboratory Hazard "Assessment" Tool)

- **Certify that you are aware of hazards in your lab**
- **Obtain PPE**



Waste Accumulation Storage Tracking electronically (WASTe)

http://ehs.ucr.edu/services/waste.html



Environmental Health & Safety

UCR Laboratory Safety Rules

1. Familiarize yourself with the lab, location and operation of the safety features (exits, fire extinguishers, safety showers, eye wash facility, and first aid and spill kits) and document this.
2. Make sure you have documented training on all aspects of lab safety relevant to your work prior to beginning potentially hazardous activities and when changes are made to the procedures.
3. Use the Integrated Safety and Environmental Management (ISEM) five step process to include safety in your preparation for lab activities.
4. Immediately notify your PI or supervisor of all accidents and incidents (spills, splashes, fires, etc.) and seek medical attention when needed.
5. Wear appropriate protective eyewear (approved goggles or safety glasses) while in a room where anyone is working with hazardous chemicals or biologicals that can splash into your eyes, or around physical hazards (e.g., pressure vessels, lasers, etc.). Wash your hands before you leave the lab.
6. Use appropriate Personal Protective Equipment, such as approved gloves, safety glasses or goggles, apron or lab coat and clothes that cover most of your skin, such as long pants, and close toed shoes, especially when using hazardous materials.
7. Do not eat, drink, smoke, or apply makeup in rooms where chemical, radioactive, or biological hazards are present.
8. Store all chemicals and other hazardous materials according to California State Law and UCR policy. Know your chemical compatibilities/incompatibilities, stability, shelf life and recommended storage conditions.
9. Dispose of all waste in the correct manner in accordance with UCR policy. There are specific protocols for chemicals, contaminated and broken glass and plastic, sharps, radioactive isotopes and biological agents.
10. Know how to respond properly in an emergency. Clean up all spills safely and promptly, and report them to the Lab supervisor. If unsure how to safely clean up a spill, ask supervisor or EH&S for assistance.

For an online version with helpful links see www.ehs.ucr.edu/resources/publications.
Please contact EH&S at (951) 827-5528 if you have any questions.

Ver. 1.1, 3/9/09, Approved by RISC and LSOs

Please Post!

EMERGENCY PROCEDURES

Visit www.campusstatus.ucr.edu for additional emergency information.

FIRE

- If your clothing catches fire: **USE SAFETY SHOWER** or **STOP, DROP and ROLL** to extinguish flames
- If safe, use fire extinguisher on flame using PASS protocol (Pull, Aim, Squeeze, Sweep)
- Activate nearest fire alarm
- Close doors to confine fire
- Evacuate
- Meet at Emergency Assembly Area
- Re-enter only when directed by authorities
- **Call UCPD**

UTILITY FAILURE

- Steam Line failure: Leave the immediate area
- Plumbing/Flooding: If you know source of leak, shut off the water if possible
- Power failure: Evacuate building as appropriate, use caution!
- Elevator Failure: Use the elevator phone to request help; activate the emergency alarm within the elevator. Call using cell phone
- Ventilation: If smoke and strong burning odor occur, evacuate immediately
- **Notify Facilities Services**

EXPOSURE RESPONSE

- Needlestick, sharps injury, or animal bite/scratch: Wash exposed area thoroughly for 15 minutes with warm water and soap.
- Eye exposure: Use eye wash to flush eyes for 15 minutes while holding eyes open.
- Skin exposure: Use nearest safety shower for 15 minutes. Stay under the shower and remove clothing.
- Reference Emergency Flipchart for Medical treatment
- **Notify PI/Supervisor and Report incident to EH&S**

FUME HOOD

Fire in hood:

- **Do not push emergency button**
- Use fire extinguisher if possible
- Lower sash completely

If alarm sounds or hood is not functioning properly:

- Stop working
- Lower sash completely
- Wait for alarm to stop – If it continues:
- **Notify Facilities Services**

IN AN EMERGENCY CALL
(951) 827-5222 (cell)
Or 9-1-1 (landline)

Notify Environmental Health & Safety:
Call (951)-827-5528 work hours 8am-5pm
Call UCPD (951)-827-5222 After hrs

Call Facilities Services (951) 827-4214 **8am-5pm**
(951) 827-4677 After hrs
Please also visit www.ehs.ucr.edu for more information

HAZARDOUS MATERIALS RELEASE

- Alert people in immediate area of spill
- If you have training, you may assist in clean-up effort of small scale spills
- Close doors to contaminated room & post signs indicating the hazard
- Limit movement of contaminated person
- Re-enter when directed by authorities

- **Notify Environmental Health & Safety (EH&S)**

SUSPICIOUS BEHAVIOR/OBJECT

- Do not interfere with people committing a crime, creating a disturbance or behaving in a bizarre manner
- Take shelter in secure area
- Report suspicious items **(DO NOT TOUCH)**
- If phone-in threat, get type, location and description of device
- Evacuate if safe to do so
- **Call UCPD**

ACTIVE THREAT

- Run: Have an escape route and plan, Leave belongings behind, keep hands visible
- Hide: In area out of the threat (shooter's view), Note your location, Barricade from threat, silence cell phone
- Fight: FIGHT ONLY as a last resort, attempt to incapacitate threat/shooter, act with physical aggression and throw items at the active shooter
- **Call UCPD**

EVACUATION

- If safe, secure any hazardous materials or equipment and close fume hoods before leaving
- Shutdown hazardous Operations
- Evacuate the building by the nearest safe exit
- Follow evacuation routes to your Emergency Assembly Area
- Notify emergency staff of potentially dangerous conditions in lab or of people that still remain in behind
- Re-enter only when directed by authorities
- Do not run or use elevator

UCR Environmental Health & Safety
UNIVERSITY OF CALIFORNIA, RIVERSIDE

Visit www.ehs.ucr.edu for more emergency procedures information

Updated: 08/03/2018

IN CASE OF AN ACCIDENT

Ensure first aid is provided, and if necessary

SEND EMPLOYEE TO:

Central Occupational Medicine Providers

4300 Central Avenue
Riverside, CA 92506
Phone: (951)222-2206
Hours: Open 24 hours – 7 Days a Week
Transportation can be requested by calling this facility in advance.

Parkview Occupational Medicine

9041 Magnolia Ave., Ste. 107
Riverside, CA 92503
(951) 353-1021
Hours: Weekdays: 8 a.m. to 9 p.m.
Weekends: 9 a.m. to 6 p.m.
After hours call (951) 351-7726

In Case of Emergency:

Riverside Community Hospital
4445 Magnolia Ave
Riverside, CA 92507
Phone: (951) 788-3000
Hours: 24-Hour Emergency Care

(Follow-up treatment should ordinarily be obtained at Parkview Occupational Medicine or at COMP)

Other Telephone Numbers and Information

Campus Emergency: 911

Labor Relations & Workers' Compensation
-Phone: X2-3641
-Web site: http://humanresources.ucr.edu/

Environmental Health and Safety
- Phone: X2-5528
- Web site: http://www.ehs.ucr.edu

Cal-OSHA (909) 383-4321

Immediately report fatalities or injuries requiring hospitalization for more than 24 hours to EH&S at x2-5528

If you become injured or ill because of your job you will be entitled to benefits under the California Workers' Compensation Law. These benefits include:

Medical Care: All authorized medical expenses are fully covered.

Selection of Doctors: If you need medical care, you will be referred to the on-site Medical Facility or to a local doctor. If you still need care after 30 days following your report of your injury, you may request your own physician if you wish.

Designation of treating physician: Prior to an on-the-job injury you may designate your treating physician by providing written notice to the University/Laboratory of the name of the personal physician who has previously treated you and who has your medical records. Contact your Supervisor or Labor Relations & Workers' Compensation Office at x2-3641 for the form and details on physician pre-designation.

Disability Income: If hospitalized, or unable to work more than three days, and your claim is accepted, you will receive income equal to two-thirds of your average pay, up to a legal maximum per week. If you receive a permanent disability, additional payments will be provided.

Supplemental Job Displacement Benefit: For injuries which occur on or after 01/01/2004 and result in permanent disability you may receive a nontransferable voucher payable to a state approved school. For details and eligibility, contact Disability Management Coordinator at X2-4785.

Death Benefit: Should the injury cause death, a benefit will be paid to dependants.

Submitting claims: Claims for Workers' Compensation benefits, including medical treatment and request for a change of doctor should be made to Labor Relations & Workers' Compensation Office, 1160 University Ave., Suite A, Riverside, CA 92521, (951) 827-3641. (Benefits may not be provided for injuries occurring during voluntary participation in any off-duty recreational, social, or athletic activity not part of an employee's work related duties)

Discrimination Protection: Employees are protected against discrimination in accordance with Labor Code section 132(a).

The University of California, having complied with the provisions of Section 3700(b) of the California Labor Code, is self-insured for Workers' Compensation. The Third Party Administrator for the University is: SEDGWICK, CMS, P.O. Box 639028, San Diego, CA 92163-9028, Phone: (619) 321-1440 or (866)265-0385 Fax: (619) 321-1449

The State of California Division of Workers' Compensation Information & Assistance Officer is also available to answer questions and assist you. The nearest office is: 3737 Main St. Room 300 Riverside, CA 92501 (951) 782-4347.

Important – Always immediately notify your supervisor of any work-related injury or illness, no matter how small. Any delay in reporting may delay workers' compensation benefits. The maximum time to report an injury is one year. If you have any questions or would like more details about workers' compensation benefits, please see your supervisor.

UCR WASTE DISPOSAL REQUIREMENTS

In case of a spill, contact EH&S at x25528 or UCPD at x25222 during non-business hours. Disposal using sinks, intentional evaporation and trash cans is against the law.

VERSION 5
May 7, 2008

	Radioactive Waste	Hazardous Chemical Waste	Mixed & Combined Waste	Medical Waste: Pharmaceuticals	Medical Waste: Red Bag & Liquid	Medical Waste: Sharps	Biohazardous Waste	Universal & Electronic	Animal Carcasses	Non-Hazardous Waste
Description	Unwanted radioactive material, including Thorium & Uranium compounds.	Any unwanted or inherently waste-like material that because of its concentration, quantity, physical, or chemical characteristics (ignitability, corrosivity, toxicity & reactivity) is considered hazardous by the State of California.	Waste with more than one category of hazard as follows: • Radioactive: any quantity • Chemical: > 1% ignitable, corrosive, water/air reactive, or toxic; > 0.1% highly toxic or carcinogenic chemicals; specifically regulated (PCB > 50 ppm, Cr (VI) > 5ppm, Ag > 5ppm, V > 0.025% etc.) • Biohazardous: any quantity	Unwanted prescription or over the counter human & veterinary drugs, if NOT a "controlled substance"[1] or radioactive material.	Waste that is produced as a result of the diagnosis, treatment or immunization of humans or animals, or research pertaining to the diagnosis, treatment or immunization of humans or animals.	Sharp or pointed objects contaminated with biohazardous waste that can cut or pierce.	All biologically contaminated waste that could potentially cause harm to human/ animal health or environment.	All used batteries and equipment containing a circuit board.	Animal carcasses/ tissues & unrecognizable human specimens/ tissues from medical or pathology labs that are not biohazardous, radioactive, or contaminated with hazardous chemicals.	Uncontaminated solid trash. Non-infectious liquids.
Examples	Gloves, protective coverings, LSC vials, contaminated items.	Any toxic, flammable, explosive or regulated material, aqueous waste with a pH less than 5 or greater than 9, solutions with heavy metals, organic/ inorganic waste solutions & solids from research & teaching labs.	Radioactive & chemical waste, radioactive & biohazardous waste, chemical & biohazardous waste, liquid scintillation cocktails, radioactively contaminated lead bricks & pigs, thorium nitrate, uranium oxalate.	Aspirin, antacids, cold remedies.	Unrecognized human specimens/ tissue, animal tissue/ carcasses & body parts, body fluids, blood or blood products (absorbed).	All hypodermic needles, syringes, blades, scalpels, razors, root canal files, contaminated broken glassware or pointed objects, slides, glass Pasteur pipettes & tips.	Human/animal cell cultures of infectious agents, waste from production of bacteria/ viruses/ spores, transgenic plants, recombinant DNA.	Used alkaline, NiCad, or silver batteries, fluorescent/ mercury vapor lamps, thermostats containing mercury, Cathode Ray Tubes, PC monitors, computers, cell phones.	Animal carcasses.	Paper, food, clothes, uncontaminated glass/ gloves/ blood/ urine, plastic ware/pipettes/ tips, tubes, autoclaved red bags with visible autoclaved indicator.
Storage & Labeling	• Use containers compatible with materials being collected • Use containers with positive closures (screw caps) & close when not in immediate use • Place containers with liquid waste in secondary containers with a capacity of 110% that of largest container • Do not allow contamination of the outside surfaces of waste containers • Do not overfill containers before submitting them for disposal	• Use chemicals compatible with containers that have positive closures (screw caps) • Close containers when not in immediate use • Place containers with liquid waste in secondary containers with a capacity of 110% that of largest container • Do not allow contamination of the outside surfaces of waste containers • Submit waste for disposal within 180 days of the start date of accumulation	Follow container requirements for the hazardous components present in the following order: • Radioactive • Chemical • Biohazards	Use tight, rigid container labeled "Incinerate Only."	• Use only red biohazard bags labeled "Biohazardous Waste" for solid or liquid waste[2] • Double bagging is strongly recommended • Orange bags are **illegal** in California	Use only red "Sharps" containers labeled as "Biohazardous."	• Use only labeled red biohazard bags for solid or liquid waste[2] • Double bagging is strongly recommended • Orange bags are **illegal** in California • Use containers compatible with collected materials & with positive closures (screw caps)	• Must be stored in such a manner as to avoid damage to the waste • Batteries can be stored in a robust container (plastic or fiber) • Must not be stored longer than 9 months	• Double bag in heavy plastic bags • No single container greater than 50 pounds	• Solids: ordinary trash containers • Liquids: drain disposal
Disposal Guidelines	To reduce disposal costs: • Identify contents accurately • Segregate by half-life: less than 15 days, 15 - 90 days, greater than 90 days • Segregate by form: sharps, dry solid, stock vials, aqueous liquids, organic liquids, filled scintillation vials, bulked scintillation cocktails, lead containers/ shielding, other • Do not place lead containers/ shielding, stock vials or uncontaminated shipping containers with dry-solid waste • Label the "sharps" container as "Radioactive Material" If the waste contains ANY hazardous chemicals, the container must be treated as a chemical waste as well.	**Separate solids, liquids, gases & segregate waste into categories:** • Aqueous acids less than ph 5 (do not mix strongly oxidizing & organic acids) • Alkaline solutions greater than pH 9 • Alkali metals & materials that react strongly with water • Strong oxidizers • Non-halogenated organic solvents • Heavy metal solutions & salts • Mercury salts & solutions • Other toxic materials • Peroxide forming chemicals • Cyanides **Empty containers** • A container is empty if no material drips out while the container is in any orientation at any temperature for any length of time • Paint over, remove or completely deface labels • Always remove lid & discard separately • Place containers directly into dumpster • Triple rinse pesticide/ EH containers (make pesticide containers unusable)	Avoid mixing wastes of different types & radioisotopes. Optimize waste disposal options: • Identify contents accurately • Avoid combining waste hazard categories • Eliminate hazardous characteristics when possible • Autoclave/ disinfect biohazardous component when practical	Tape closed in rigid container.	• Decontaminate with 10% bleach (30 minutes contact time), then release to sewer with abundant water if no chemicals or radiologicals are present • Solid medical waste must be autoclaved in an approved autoclave or package for collection by EH&S • Red bags must have indicator or autoclave tape to ensure proper decontamination prior to disposal as well as a label with the generator's building & room number • Recognizable human tissue/ specimens must be cremated • Red bags must be weighed before decontamination and the amount of waste must be recorded	• Use an approved sharps container • Do not overfill • Close when full • Pipettes & pipette tips can be disposed of in a cardboard box with a red biohazard bag inside (when the box is full: seal the bag, tape the box closed, place in double red biohazard bags, autoclave with indicator tape & place in trash or call EH&S for pickup)	Decontaminate with 10% bleach (30 minutes contact time), then release to sewer with abundant water if no chemicals or radiologicals are present. • Solid biohazardous wastes must be autoclaved in an approved autoclave or package for collection by EH&S • Red bags must have indicator or autoclave tape to ensure proper decontamination prior to disposal as well as a label with the generator's building & room number	• Universal waste containers must be labeled with the words "Universal Waste" or, in the case of batteries, "Used Batteries" • All types of universal waste must also be labeled with the Accumulation Start Date • Submit a Chemical Request for Pick Up to EH&S when a container has been accumulating waste for 9 months	• Avoid including paper, wood or plastic products with waste • Arrange transport to storage freezer • Recognizable human specimens/ tissues must be cremated • Red bags must have indicator or autoclave tape to ensure proper decontamination prior to disposal • Contact Office of the Campus Veterinarian at 827-5912 for more information	• Sharp objects (uncontaminated broken glass, Pasteur pipettes & tips, blades) must be placed in a hard-sided container • Non-hazardous materials in scientific containers should not be placed in the trash unless any hazard labels are clearly blacked out • Contact Building Services at 827-4219 for more information

Use the UC Waste Tag program at http://otp.ucop.edu/

Label with words *"Biohazardous Waste"* & *Biohazard Symbol*

Use applicable words, for example: *"Used Computer"* or *"Used Batteries"*

No Waste Label Required

No Waste Label Required

Submit chemical waste pick-up request for disposal of ALL empty chemical containers 4 L or larger

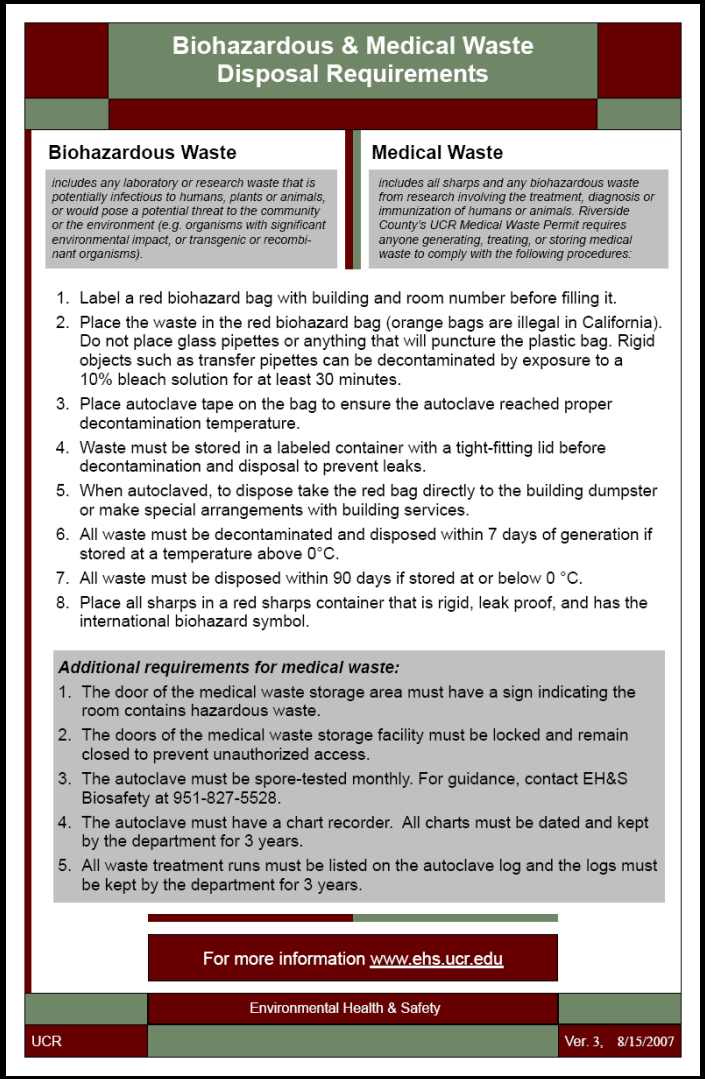
FOR WASTE PICK UP REQUESTS, OR DETAILED INFORMATION: www.ehs.ucr.edu/programs/p2.aspx?id=54 **Questions? Call 827- 5528**

[1] For Disposal of Controlled Substances contact Materiel Management (www.matmgmt.ucr.edu, or call 951-827-3000). For a Department of Justice, Drug Enforcement Agency schedule of controlled substances, visit: www.deadiversion.usdoj.gov/schedules)

[2] All red bags must be stored in rigid, leak proof containers with a tight fitting hood and labeled with the biohazard symbol on the top and four sides

UCR Research Integrated Safety Committee Approved

Posted in relevant laboratories



Biohazardous & Medical Waste Disposal Requirements

Biohazardous Waste

includes any laboratory or research waste that is potentially infectious to humans, plants or animals, or would pose a potential threat to the community or the environment (e.g. organisms with significant environmental impact, or transgenic or recombinant organisms).

Medical Waste

includes all sharps and any biohazardous waste from research involving the treatment, diagnosis or immunization of humans or animals. Riverside County's UCR Medical Waste Permit requires anyone generating, treating, or storing medical waste to comply with the following procedures:

1. Label a red biohazard bag with building and room number before filling it.
2. Place the waste in the red biohazard bag (orange bags are illegal in California). Do not place glass pipettes or anything that will puncture the plastic bag. Rigid objects such as transfer pipettes can be decontaminated by exposure to a 10% bleach solution for at least 30 minutes.
3. Place autoclave tape on the bag to ensure the autoclave reached proper decontamination temperature.
4. Waste must be stored in a labeled container with a tight-fitting lid before decontamination and disposal to prevent leaks.
5. When autoclaved, to dispose take the red bag directly to the building dumpster or make special arrangements with building services.
6. All waste must be decontaminated and disposed within 7 days of generation if stored at a temperature above 0°C.
7. All waste must be disposed within 90 days if stored at or below 0 °C.
8. Place all sharps in a red sharps container that is rigid, leak proof, and has the international biohazard symbol.

Additional requirements for medical waste:

1. The door of the medical waste storage area must have a sign indicating the room contains hazardous waste.
2. The doors of the medical waste storage facility must be locked and remain closed to prevent unauthorized access.
3. The autoclave must be spore-tested monthly. For guidance, contact EH&S Biosafety at 951-827-5528.
4. The autoclave must have a chart recorder. All charts must be dated and kept by the department for 3 years.
5. All waste treatment runs must be listed on the autoclave log and the logs must be kept by the department for 3 years.

For more information www.ehs.ucr.edu

Environmental Health & Safety

UCR

Ver. 3, 8/15/2007

Reminders

- Take necessary Health and Safety classes
- Read Chemical Hygiene Plan and sign
- Locate your lab's first aid kit, safety shower, eyewash, and fire extinguisher
- Locate &/or request PPE
- Learn the hazards of any procedure you undertake and take appropriate safety measures to avoid injury.
- All procedures should have an SOP(standard operating procedure). Make sure you know and FOLLOW them!

Contact Information

- Christina Hoddle, Entomology LSO
- Chapman108
- Extension 24360
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- Pamela Anne See, Safety Mentor EHS
- Extension 25878
- pamela.see@ucr.edu