USM lab safety guidelines reflect compliance with the OSHA Laboratory Standard 29 cfr 1910.1450 and their recommended adherence to “Prudent Practices in the Laboratory” (National Academic Press) in appendix A of the Lab Standard.

The OSHA Laboratory Standard 29 cfr 1910.1450 and Prudent Practices in the Laboratory can be found on the EHS website.

**Training and Compliance**

All Principle Investigators (PI) and teaching lab coordinators that supervise labs must develop a lab management plan. PI/lab supervisors are responsible for all safety training for their lab personnel. This includes training for all lab-specific hazards and SOPs. All training must be properly documented in the lab management plan. Individuals cannot not engage in activities for which they have not been trained. Enforcement is the responsibility of the PI/lab supervisor.

**General safety**

* Know the hazards of the materials you are working with (e.g., chemical, biological, radioactive.) Follow all written laboratory protocols and review the SDS information for all chemicals with which you will be working.
* Know how to log in to ChemTracker inventory system and access SDS information for your particular lab.
* Know where the safety shower, eye wash, fire extinguisher, first aid kit and other safety equipment are located before you start working in the laboratory.
* Know all emergency and evacuation procedures for your laboratory (e.g., fire escape routes, assembly areas, etc.).
* Each lab is required to have a Laboratory Management Plan (safety manual and SOPs that are specific for the lab). It should include lab standard operating procedures, department emergency procedures, department safety polices, and other reference materials applicable to your lab.
* Always wear appropriate clothing (e.g., long pants, closed-toe shoes). Shorts and sandals should not be worn in the lab. Any loose or flowing items (such as ties, scarves, necklaces or bracelets) should be removed or secured before beginning lab work.
* Always wear appropriate personal protective equipment (PPE). Examples include safety glasses, lab coats, and gloves.
* Remove personal protective equipment before leaving the laboratory.
* Disposable gloves are NOT to be worn outside the laboratory.
* Always wash your hands before leaving the lab area and avoid touching your face with contaminated gloves or hands.
* When working with hazardous biological agents always use a biological safety cabinet (BSC2/3).
* Biosafety cabinets must be certified annually.
* Use a chemical fume hood when working with hazardous or volatile chemicals.
* No eating, drinking, storing food, or applying cosmetics in the laboratory.
* Mouth pipetting is strictly prohibited.
* Never recap syringe needles.
* Keep work areas clean and uncluttered at all times.
* Keep all laboratory doors locked when the lab is unoccupied and closed when working. Do not prop open lab doors. Check your individual lab protocols for additional security policy. Keeping the lab secure helps prevent untrained individuals from entering and reduces the opportunity for theft.
* Children under the age of 12 are not permitted in laboratories using hazardous chemicals, biologicals or radioactive material. Exceptions include teaching, demos, tours or other special cases but must be approved by the department or EHS.
* No pets are allowed in lab areas. Keep in mind that animals are just as vulnerable to laboratory hazards as humans.
* Do not operate centrifuges, autoclaves, or other hazardous equipment without proper training.
* Do not work alone in the lab. Use the buddy system in case there is an emergency.

**Compressed Gas Cylinders**

* Always transport gas cylinders with safety caps in place and use a sturdy cylinder dolly with a chain to secure the cylinder in place. Never tilt and roll a gas cylinder to move it.
* Never store compressed gas cylinders on carts or on the floor horizontally. Always store cylinders in an upright position and securely fastened.
* All cylinders have potential to become missiles if the cylinder falls and fractures the valve. Cylinders therefore must be treated with respect and caution.

**Vacuum and Pressure**

* Any glass vacuum apparatus must have suitable shielding or be placed in a fume hood (with sash closed) in case of implosion.
* Glassware under vacuum should be resin coated, taped or covered with a protective mesh.
* Pressure vessels must be in good condition and cannot be used in excess of their safety rated pressures. Any safety equipment must be functional and cannot be removed.
* Pressure vessels should have suitable shielding in place.

**Pyrophorics**

* The PI must be informed and must approve any experiment using pyrophorics.
* Anyone attempting experiments with pyrophoric materials must be suitably trained by the PI before any experiment begins.
* A flame resistant lab coat is required at all times
* A fire extinguisher must be readily available at all times (within easy reach).
* A buddy system must be in place such that when critical stages of the experiment occur, such as transfer or possible exposure of the pyrophoric material, a second person with a fire extinguisher is on hand.
* The second person in the buddy system should be experienced and capable of handling any adverse situation.
* Training resources for handling pyrophoric materials can be found at: http://labsafetyworkspace.org/

**Radiation**

* Labs using radiation must have appropriate signage.
* Radiation detection equipment should be calibrated (annually) and readily available.
* Proper radioactive shielding must be in place.
* All radioactive materials in the laboratory must be kept secure.

**Radioactive procurement**:

* Only registered labs that are current on radiation safety training can purchase radioactive materials.
* Purchase must be made using a purchase order approved by EHS.

Order Process:

1. Lab enters requisition.
2. Lab notifies EHS with requisition number.
3. EHS approves req. for Procurement Services so that the PO can be generated.
4. Procurement Services notifies EHS with PO number.
5. Lab places order and informs EHS of estimated delivery date.
6. EHS delivers package to lab. Note: Only approved users can receive radioactive package.

**Chemical Procurement**

* Chemicals can be purchased through any vendor, but must be shipped to the Fisher Storeroom (100 Charles Lane Drive) to be entered into the ChemTracker inventory database.
* Adherence to ChemTracker is mandatory.
* See radiation section for radiation procurement

**Chemical Storage**

* All chemicals must be segregated and stored based on compatibility.
* No more than 10 gallons of flammable liquid can be stored in a lab outside of a flammable cabinet.
* Acids and bases should be stored separately in a noncorrosive cabinet.
* All containers must be properly labeled.
* Flammable, explosive or other hazardous chemicals require storage in an explosion proof refrigerator.
* Peroxide forming chemicals should be dated upon receipt, when opened and tested for peroxides as needed (6 months, 12 months etc,…).

**Housekeeping**

* Good housekeeping is essential for safe lab function. Lab clutter can cause spills, falls, and broken glassware. Keep hoods, floors, workbenches, sinks, cabinets, and storage areas free of any clutter. USM custodial crews will only clean the floor and empty trash bins. It is the responsibility of laboratory personnel to clean workbenches and sinks.
* Aisle and exits should be unobstructed.
* Electrical panels should have at least a 3 foot clearance area around them.
* Keep combustibles like boxes and unnecessary papers to a minimum.
* All ceiling tiles should be in place.
* Sprinkler systems require 18 in. of clearance to function properly therefore, do not store items that may block sprinklers

**Personal Protective Equipment**

*Eye and Face Protection*

* Safety glasses, goggles, and/or face shields must be worn when working with or around hazardous chemicals or infectious agents that can splash into the eyes. The type of eye protection required depends on the hazard. It is the responsibility of the individual to wear adequate protective eyewear as specified in the protocol being performed.
* Chemistry laboratories typically require eye protection at all times when in the laboratory.
* Typically prescription glasses do not provide adequate eye protection. Safety glasses that fit over prescription lenses are available.
* Contact lenses may be worn in certain lab settings but requires the use of chemical splash goggles.

*Gloves*

* The appropriate glove must be used when handling hazardous materials.
* Never wear disposable gloves outside of the laboratory areas. Wearing gloves outside of the lab has the potential to contaminate public areas and may alarm non lab personnel.

*Laboratory Coats and Aprons*

* Laboratory coats and/or aprons are required when working with hazardous chemicals or biological agents. Check your laboratory management plan for other requirements.
* Coats and aprons should not be worn outside the laboratory.

*Respirators*

* Respirator wearers must be fit tested and pulmonary function tested annually. Lab management plans must contain respiratory safety plan.

*Apparel*

* Closed-toe shoes (no sandals or flip flops) are required while in the laboratory.
* Long pants are strongly recommended for any work in a laboratory setting and maybe a requirement. Check your lab management plan or consult the lab PI for details.
* Special attention to secure loose-fitting or hanging clothing (ties or scarfs) must be made while in the laboratory.
* For certain equipment operation loose fitting clothing is prohibited. Check safety manuals and/or the lab management plan for details
* **Long hair should be pulled back and secured.  
    
  Laboratory Safety Equipment**
* Emergency safety equipment cannot be blocked by anything that would prevent immediate use.
* Individuals are responsible for knowing where all emergency equipment, fire alarms and exits are located in and around their laboratory area.
* Safety Showers, drench hoses, and eye wash stations must have a highly visible sign and be tested monthly with documentation.
* All laboratories must be equipped with a wall or cabinet mounted fire extinguisher.
* All laboratories must maintain a stocked spill kit appropriate for common laboratory hazards and volumes in the particular lab.
* All laboratories must maintain a stocked first aid kit.
* All laboratories should have laboratory safety information and emergency contacts posted on the lab entrance.
* All laboratories should have a laboratory evacuation map posted on the exit doors.
* \*Note add: All laboratories must have the EHS lab hazards poster placed on the lab entrance.

**Emergency and Accident Procedures**

* **In the event of emergency requiring first responders dial 911. This includes any life threatening situation or property damaging fire.**
* Any fire, injury, or spill needs to be reported to your safety coordinator and EHS (266-4045) as soon as possible, even if they are minor and require no further action.
* An incident report provided by your department or safety coordinator is required for each accident.

**Chemical, Biological, or Radioactive Spills**

* Alert all lab personnel.
* If a chemical has spilled on you or splashed in your face/eyes use the emergency shower or drench hose for at least 15 minutes. Remove any contaminated clothing to minimize further exposure.
* Small spills of minimal hazard, and can be cleaned up by lab personnel. Label and package waste generated from the spill clean-up for pick up by EHS. Materials from minor biological spills can be bagged, autoclaved and disposed.
* In the event of a major spill evacuate the area and close the door to the laboratory facility. If possible, and if safe to do so, turn off any ignition devices on your way out.
* Contact your faculty supervisor or Department Safety Coordinator. If after hours or on weekends, contact USM Police at 601 266 4986. Be prepared to provide the identity, amount, and location of the spill, as well as your location and a phone number where you can be reached (not your lab phone, since you should not remain in the lab after the spill).

**Cuts, wounds or other injuries**

* Cuts or other small wounds can be treated on site using a first aid kit. Contact your safety officer or PI to see if an incident report and EHS notification is needed.
* For non-life threatening injuries that require medical attention, the injured person should be taken to HealthWorks located at 5909 US 49 #20 (near Wal-Mart). If after hours, take the individual to Forrest General Hospital or Merit Health Wesley Medical Center (emergency room).
* For all potentially life threatening injuries call 911.

**Pathogens**

* If you have been potentially exposed to a Pathogen, contact your faculty supervisor, and Department Safety Coordinator, as soon as possible.

**Fire or Explosion**

* Don’t panic.
* Evacuate all personnel.
* Activate the fire alarm. Contact fire department from a safe location Do not assume someone else has called. Be prepared to provide the type, size and location of the fire or explosion
* Close all fire doors.
* Only if you have had proper training in fire extinguisher use should you attempt to put out any fire
* If the fire is large and/or dangerous, exit the building do not attempt to extinguish.

**Building Access and Security**

* Any laboratory that contains hazardous materials such as chemical, radiological or biohazards must be kept secure during the day and locked after hours.
* The security of each lab and its contents is the responsibility of the PI and lab personnel. Therefore any suspicious activity should be reported immediately to University Police.

**Radiation Training**

* All students and faculty who use radioactive materials or equipment in their research need to complete the online radiation training through EHS. Annual refresher training is required for all approved users. Only labs with complete training records will be allowed to purchase radioactive materials.

**Fieldwork**

* The PI is responsible to ensure that students have been trained on all safety aspects of the work being performed in the field. Documentation of the training must be kept in the lab management plan.

**Waste Disposal Procedures**

**Empty Chemical Containers and ChemTracker**  
Empty chemical containers can be placed in the regular trash. However be sure to remove the ChemTracker label and return to EHS for inventory deletion (you can delete it yourself, if your lab has modify access).

* For containers that held particularly hazardous substances (highly toxic, carcinogenic, or reproductive toxins) contact EHS for disposal
* Dispose of all needles, syringes, razor blades and other sharp items in a sharps container. Never overfill a sharps container. EHS is responsible for pickup and disposal of sharps containers.
* Broken glass should never be placed in the regular trash. Always use an appropriate glass disposal box for broken glass waste. Full glass disposal boxes should be taped shut and placed in the dumpster.

**Chemical Waste**

* Remove the ChemTracker label on any empty chemical containers and return to EHS for inventory deletion (you can delete it yourself if your lab has modify access).
* Containers must have a Hazardous Waste label.
* Labels must include start date, contents and their percentages, and owner’s initials. Contents must be clearly labeled in pencil or some other bleed resistant marker. Use the full chemical name.
* Use only containers in good condition and compatible with the waste stream.
* Painted 20L cans (crimped cans) tend to leak and therefore are not acceptable for waste storage.
* Containers must be closed at all times except when adding or removing waste.
* Containers must be kept in secondary containment that will hold 1.5 times the volume of the largest container.
* Do not fill containers over 90 % full.
* Incompatible wastes must be kept segregated.
* Do not store waste longer than 2 weeks.
* Highly reactive waste cannot be blended with our traditional waste stream and requires special handling (this may require a lab pack and cost to the department).
* EHS provides weekly pick-up on Fridays. Special pick-ups can be scheduled by contacting EHS.
* Unwanted chemicals in good condition are not necessarily waste. Chemicals that are no longer useable in one lab may be useful in another. These chemicals must be offered to other lab/departments prior to being targeted for disposal via lab pack. It may be the responsibility of the lab and/or department to pay for this type of disposal.

**Biohazardous Waste**

* Laboratories that produce biohazardous waste are responsible for autoclaving and disposal of their waste.
* Do not use red biohazard bags.
* Sharps must be placed in appropriate containers and will be picked up by EHS for disposal.

**Radioactive Waste**

* **Never put radioactive waste in the regular trash or down the drain.**
* All radioactive waste will be picked up for disposal by EHS.
* Containers must be labeled with the isotope, PI/lab number and date.
* Liquid radioactive waste must be labeled with its contents (if a mixture of solvents or buffer) isotope, PI/lab number and date.
* Efforts should be made to not generate mixed wastes due to the high cost of disposal.

**Glass**

* Broken glass should never be placed in the regular trash. Always use an appropriate glass disposal box for broken glass waste. Full glass disposal boxes should be taped shut and placed in the dumpster.
* Small unbroken glass containers can be placed in the regular trash. Larger bottles (4L) can be placed in a box and then in the dumpster.

**Lab Inspections**

EHS, along with departmental safety officers, performs safety inspections to ensure all labs are compliant with the safety guidelines. (A blank copy of the inspection form is available on the Resources page of the EHS website.) Inspection reports are then sent to department safety officers for dissemination to PIs. EHS must have documentation that the issues on the inspection report have been addressed. It is the responsibility of the PI to ensure that all issues are resolved in a timely manner.

**Lab Close Out**

All faculty or teaching lab coordinators leaving the university or moving operations to another room must complete the Lab Close Out form. The form needs to be completed by the PI/lab coordinator and submitted to EHS 2 weeks prior to exit/move. The form needs to be signed by both the PI and department chair before sending to EHS.  EHS will then return to the lab to perform final close-out inspection.  Extra attention needs to be given to identifying and disposing of any samples remaining in the labs from previous work.