MEMORANDUM

TO: Department Chairs, Directors, Faculty and Laboratory Managers
FROM: Megan Utley, Viterbi Laboratory Safety Specialist
DATE: October 01, 2021
SUBJECT: Laboratory Safety Policies and Procedures

Each semester we distribute our lab safety memo which covers the federal, state, and university regulations, requirements and policies related to activities occurring in and around our research and instructional laboratories.

At the start of each semester, Principal Investigators (PIs) and lab personnel should communicate and review the pertinent obligations outlined in this memorandum with all individuals working in and around their laboratories. The University and the Viterbi School rely upon our faculty and lab managers to foster a safe environment and safe practices in our labs. Please note that I am available to assist with all lab safety issues.

During the COVID-19 pandemic, USC offers information, updates, and support for faculty, staff, and students through the COVID-19 Resource Center. To notify the University of a positive case, or to request additional information, please call 213-740-6291 or email covid19@usc.edu.

The sections below contain hyperlinks (underlined and in blue text) to webpages and online resources. A copy of this memo with the full URLs in place of the hyperlinks is available upon request.

I. Information for all lab environments

It is essential that PIs and lab personnel are aware of their role and responsibilities to maintain a safe working environment, even during the pandemic. It is the responsibility of the PI to identify hazards in the lab and provide appropriate engineering safety controls, administrative controls, and personal protective equipment (PPE) for their lab personnel. Supervisors should conduct regular inspections of their labs to identify and evaluate hazards and unsafe work practices. Working with the PI, lab personnel should ensure that appropriate personal protective equipment is being utilized and engineering controls are in place.

All new experimental setups and procedures should be approved by the PI prior to beginning the experiment. Lab personnel should work with their PI to develop Standard Operating Procedures (SOPs) for each procedure. If new infrastructure or facilities are required for the setup, the lab group or PI should contact the Viterbi Facilities team or me at meganutl@usc.edu for assistance.
USC’s Environmental Health and Safety (EH&S) laboratory safety standards are available electronically at the EH&S website. The University expects schools to provide a safe working environment in instructional and research labs. Schools are required to:

- Provide necessary instruction/training on the use of equipment and experiment procedures;
- Provide personal protective equipment for the applicable activities in laboratories;
- Promote compliance with the standards for safe behavior in the laboratory; and
- Instruct group members in the proper use and limitations of lab PPE (gloves, booties, gowns, etc.).

For further information on the safety roles and responsibilities incumbent on the various members of the USC community, please refer to USC’s Injury and Illness Prevention Plan and USC’s safety policies, including the Research Personnel Protection policy.

**Personal Protective Equipment (PPE) Compliance**

It is the responsibility of PIs and supervisors to ensure lab personnel consistently use PPE appropriate to the identified hazards. This is especially critical for eye protection - failure to wear eye protection or using incorrect eye protection (i.e. safety glasses instead of goggles for liquid splash hazards) have been consistent findings in multiple EH&S investigations of near-miss incidents over the last several years. PIs and supervisors are expected to communicate clear rules on PPE usage to their personnel, monitor compliance, and enforce satisfactory PPE standards through retraining, or retraining plus disciplinary measures in cases of persistent non-compliance.

**Fire/Life Safety Provisions** (pertains to wet and dry labs including computational labs)

In accordance with state law we are required to comply with the Los Angeles Fire Code. Additional information or questions on fire code requirements for compliance may be found at the USC Fire Safety and Emergency Planning website. In addition, PIs and lab supervisors must ensure that hallways and common areas are kept clear of cabinets, furniture, trash, and other items. Items left in these areas can block egress and create potentially hazardous conditions.

Fire doors and laboratory doors must not be propped open. Doorways must be kept free of any impediments to egress, including items (such as equipment or shelving) that may fall during an earthquake and interfere with the door opening.

PIs and lab supervisors should ensure their staff and students are familiar with the locations of fire extinguishers, fire alarm pull stations, emergency exit routes, and engage in proper lab safety procedures with regard to fire hazards. The Office of Fire Safety and Emergency Planning provides training on the proper use of fire extinguishers and emergency procedures. Please contact Jeff Pendley at (213) 281-0963 | pendley@usc.edu or Rob Forsberg at (213) 440-0381 | forberg@usc.edu for fire extinguisher training and additional information about their programs.

**Purchased or Donated Equipment**

Specialized equipment often requires new utility hookups or alterations to existing facilities. For example, new equipment may require a specific voltage or may need high purity gases, necessitating new outlets and
piping. Large equipment may be too heavy for or not fit into the building’s elevator. Extremely heavy equipment might require an evaluation to determine if the floor can support the additional weight.

Whenever possible, please contact VBA Facilities prior to purchasing or accepting donated equipment, so that arrangements can be made to ensure the appropriate facilities for the equipment can be provided.

**Hazardous Waste and Large Item Disposal**

EH&S and FMS procedures for hazardous waste and large item disposal have changed significantly over the past year. EH&S now requires hazardous waste requests to be submitted through the Environmental Health and Safety Assistant (EHSA) website. Instructions can be found at the [EH&S Hazmat Pickup webpage](#).

Disposal requests for large items such as furniture, packing crates, and other items that will not fit easily into a dumpster must be submitted to FMS through the Customer Resource Center by calling 213-740-6833 or through the Waste and Recycling Supervisor’s office at 626-862-1750 | gwhisna@usc.edu. Payment may be required for the removal of these items.

**II. Specialized Lab Environments and Training**

Initial training is provided by EH&S, and, depending on the topic, may require annual refresher training by PIs. Frequency of training can be found on EH&S’s [training webpage](#).

**Undergraduate Lab Safety Requirements**

PIs should make certain all undergraduate students in directed research, student workers, work study students and high school students working in Viterbi School research laboratories attend EH&S’ General Lab Safety (GLS) Training on laboratory safety. Additional courses may also be required if there exists actual or potential exposure to hazardous materials or equipment, *e.g.*, toxic chemicals, biohazardous agents, bloodborne pathogens, radioactive materials, X-rays, lasers, etc. Registration for the General Lab Safety Training (and all EH&S courses) can be found on EH&S’ training [registration page](#).

**Volunteers and High School Students**

USC has a [Minors in Laboratories and Shops policy](#) which must be followed in all cases. PIs should familiarize themselves with the policy, which includes age restrictions, safety rules, training and supervision requirements, and required documentation.

High school students must have the [USC Parent Consent Form](#) completed, signed, and returned to their USC research advisors prior to working in any USC research laboratories.

If any volunteers are working in your lab, they must fill-out and sign the USC [Volunteer Agreement Form](#). Please retain these forms for your records. These forms are not submitted to EH&S or any other USC office.
**General Lab Safety Course**

All university employees, faculty, visiting scholars, volunteers, undergraduates, etc. working in university research laboratories are required at a minimum to take the EH&S General Laboratory Safety Training if individuals will be handling hazardous materials or equipment, *e.g.*, toxic chemicals, biohazardous agents, bloodborne pathogens, radioactive materials, x-rays, lasers, etc. Other trainings may be required depending on the hazards you are handling. Registration for this class (and all EH&S courses) can be found on EH&S’s training [registration page](#).

**Annual Laboratory Refresher Training**

All personnel working in labs must complete annual lab safety refresher training provided by their PIs (or designees). All sign-in sheets must be submitted to EH&S. See the EH&S website and the EH&S [Annual Laboratory Safety Refresher](#) page for more information, including a guide to training topics.

**Labs Using Chemicals**

PIs must complete a Lab Hazard Assessment Tool (LHAT) for their labs and maintain Standard Operating Procedures (SOPs) for all procedures involving hazardous chemicals or processes. All users of these chemicals and processes must review and sign the SOP. Templates for SOPs can be found at EH&S’ [SOP page](#).

In addition, an [online chemical inventory](#) must be maintained and updated at least once a year for all areas storing hazardous materials including compressed gases. EH&S uses Environmental Health and Safety Assistant (EHSA) to track inventories and current lab personnel and to assist labs with generating their lab placards. EH&S has provided a [User Guide](#) for the EHSA Chemical Inventory database and a [Placard SOP](#) to help users of the system.

All personnel storing and/or using chemicals should familiarize themselves with the [USC Chemical Hygiene Plan](#). Please note that food and drink cannot be stored or consumed in any lab containing hazardous materials and that the minimum attire for occupying a lab includes full-length pants and fully closed shoes (no skin exposed). If any work is taking place in the lab, Personnel Protective Equipment (PPE) appropriate to the hazards (most commonly lab coats, gloves, and eye protection) is required to be worn in addition to the minimum attire.

**Labs Using Biohazardous Agents**

Researchers conducting research with infectious agents, toxins, human cells/blood/tissue, recombinant DNA or other bio-hazardous agents must have their research approved in advance by the Institutional Biosafety Committee (IBC) by completing a Biohazardous Use Authorization (BUA) form. IBC and BUA information and resources are available at the [Biosafety webpage](#). BUA approvals are valid for three years. The PI is responsible for obtaining timely renewals from the IBC. Without current approval, no research activity involving these materials may be conducted.

PIs working within a laboratory rated BSL-2 or higher, or within which hazardous materials or equipment are used, should develop written laboratory safety plans. These plans should list required
protective equipment (e.g., type of glove, eyewear), and include procedures for containment failure, spills, and emergency response.

Also, if shipment of biological materials (e.g., blood, serum, and other potentially infectious agents) and/or dry ice will occur, shipping training is required. Registration for this class (and all EH&S courses) can be found on the EH&S training registration page. For any biosafety related questions, please contact the Biosafety Office at biosafety@usc.edu.

**Labs Using Bloodborne Pathogens (BBP)**

In addition to taking the General Lab Safety Course, anyone who works with (or has the potential to be exposed to) human or non-human primate blood, blood products, cell lines, bodily fluids, or other potentially infectious materials must take the EH&S’s Bloodborne Pathogens training course. Registration for this class (and all EH&S courses) can be found on the EH&S training registration page. Additional training is required when working in laboratories with HIV, HBV, and HCV production. EH&S will work with the PI to determine how this training is completed.

**Labs Using Radioactive Materials**

Before working with radioactive materials, researchers must first submit a “Radiation Use Authorization” (RUA) via the USC iStar application located at istar.usc.edu. For more information please contact radsafety@usc.edu or visit EH&S’ Radiation Safety webpage.

In addition to taking the General Lab Safety Course, researchers handling radioactive materials must take the EH&S Radiation Safety Course. Registration for this class (and all EH&S courses) can be found on EH&S’s registration page.

**Labs Using Lasers**

Lasers create intense collimated light. Their unique properties make them essential for many types of research at USC. Those properties also make them a unique hazard. Some of the hazardous properties of lasers include high intensity, unidirectionality, and invisibility. Lasers also pose a significant electrical, chemical, and fire hazard. Each lab using hazardous lasers is inspected yearly for their safe use. EH&S provides more information on their Laser Safety webpage.

USC’s Laser Safety program provides support to users of hazardous lasers—lasers which are either class 3B or 4. Please contact radsafety@usc.edu for training if you will plan to use a laser class 3B or above for your research.

**Labs Using X-Ray Diffraction**

Anyone who works with (or has the potential to be exposed to) x-rays produced by analytic X-ray Diffraction Equipment must take a training course through EH&S. Please contact radsafety@usc.edu to schedule training.

**Labs Using X-Ray Irradiators**

- 5 -
If you would like to work with the x-ray irradiator in the Eli & Edythe Broad Center for Regenerative Medicine & Stem Cell Research Building (BCC), you should first contact the Radiation Safety group using the EH&S contact form or call (323) 442-2200 for training on using the X-ray irradiator.

**Additional Training Information**

Prior to using a respirator, the user must be enrolled in the USC Respiratory Protection Program, which entails medical clearance, annual training, respirator fit testing, and monthly equipment inspection. Contact Lawrence Bergenfield at lbergenf@usc.edu or (213) 379-1006 for training and fit testing with your respirator.

Additional training may be required depending on the nature of the research. For example, the Institutional Biosafety Committee (IBC) may identify additional training that should be completed before associated research is allowed to begin or continue.

PIs and lab managers should direct individuals to the lab training needed to work in their labs and document initial and annual lab specific training on lab safety procedures.

EH&S’s Laboratory Safety Training Schedule is available on EH&S’s registration page. EH&S staff may be available for customized training, particularly for large groups. A minimum of two weeks advance notice is requested. You can contact EH&S at safetytraining@usc.edu for information.

**III. Reporting Incidents**

USC’s “Injury and Illness Prevention” policy is published on the University’s website. This policy replaces the former safety policy and outlines the safety roles, responsibilities and expected practices within the university community, including research laboratories.

All emergency incidents (e.g. fire, failed containment, spills, injuries, or illnesses requiring medical attention beyond first aid or transportation, human exposure to or misuse of biological materials, chemicals or radiation, or ongoing criminal activity) should be reported immediately to DPS at 213-740-4321. The Emergency Notification and Incident Reporting page provides guidance on additional reporting requirements, including links to the appropriate incident report forms.

PIs should also familiarize themselves with the related fact sheet for reporting non-emergency injuries and illnesses incidents.

Incidents involving exposure or loss of containment of recombinant DNA or transgenic organisms are subject to special reporting requirements under NIH guidelines. PIs who use recombinant DNA or transgenic organisms should read the Biosafety Manual and ensure their lab personnel are familiar with reporting requirements.
The EH&S Emergency Notification Poster (“1-2-3 poster”) should be printed and prominently displayed in all labs, workshops, and other areas where incidents may occur; it is advisable to also post in offices. PIs should ensure their personnel are familiar with the emergency notification procedures outlined on the website and the poster, and should ensure their personnel have DPS emergency and non-emergency numbers programmed in their phones. (UPC DPS emergency 213-740-4321; UPC DPS non-emergency 213-740-6000).

I hope you find this information helpful. If you have any lab safety questions, please refer to the EH&S website, VBA Facilities website, or contact me at (213) 821-8307 | meganutl@usc.edu.

Cc:  Yannis Yortsos                 Kimberly Bregenzer
         Gaurav Sukhatme               Jeffrey Wiginton
         Maja Mataric                  Erik Johnson
         Mahta Moghaddam               Tim Cowell
         Kasia Bzdak                   Cassandra Nash
         Jim Moore