

LABORATORY COMMISSIONING

Scope and Introduction

This document applies to all research, teaching, diagnostic, and clinical laboratories at UNL and affiliated campuses. Any research involving human subjects, human embryonic stem cells, human fetal tissue, radioactive material or radiation-producing devices, recombinant/synthetic nucleic acids, pathogens (human, animal, or plant), or biologically-derived toxins, and live vertebrate animals requires approval of the appropriate institutional oversight committee(s). Usually, committee approval must be obtained *prior to initiation* of the work. These committees include:

- Institutional Review Board (IRB)
- Scientific Research Oversight Committee (SROC)
- Radiation Safety Committee (RSC)
- Institutional Biosafety Committee (IBC)
- Institutional Animal Care and Use Committee (IACUC)

Find out more about these committees at: <https://research.unl.edu/researchresponsibility/>

Additionally, all lab staff, including PIs, are required to complete applicable training modules prior to initiating work. The training needs assessment tool can be used to identify applicable training modules administered by EHS (<https://ehs.unl.edu/web-based-training>). This needs assessment does not include training that may be required by the IRB, SROC, or IACUC. Refer to the appropriate committee website for additional training requirements.

General Considerations

- Survey the lab space and make note of any items in need of repair (broken handles, electrical fixtures, plumbing leaks, etc.). Notify Building Systems Maintenance (BSM) or your facility manager of any repair needs.
- Promptly dispose of unwanted chemicals via EHS. See the EHS SOP, *Hazardous/Radioactive Material Collection Procedures*.
- Locate and test the nearest emergency eyewash station(s). Plan for testing on a weekly basis. A written log can serve as a reminder. Lab staff are not responsible to test the emergency shower. Notify BSM or your facility manager of needed repairs/adjustments.
- Locate the nearest fire extinguisher(s) and ensure that the tag indicates an inspection date within the past 12 months. Notify BSM or your facility manager if the inspection date is greater than 12 months.

- Ensure proper handwashing facilities are available, which includes soap and disposable drying towels.
- If you will be receiving research materials from another location (on or off-campus), make sure they are transported according to current guidelines and regulations. **Import permits may be required.** Consult with the UNL Office of Research and Economic Development (ORED) or EHS for additional guidance.
- An extensive library of Safe Operating Procedures (SOP) pertaining to many aspects of research and safe work practices are available on the EHS website for download. These SOPs can be assembled into a Laboratory Safety Manual using the EHS Virtual Manual tool (<https://scsapps.unl.edu/VirtualManual/>). All laboratories are required to have a Chemical Hygiene Plan (CHP). Use the EHS Virtual Manual tool to prepare a CHP or develop your own CHP that complies with the Occupational Safety and Health Administration's standard for Occupational Exposure to Hazardous Chemicals in Laboratories, 29 CFR 1910.1450.
- Assemble appropriate personal protective equipment (PPE) for the proposed lab work. At a minimum, this will include lab coats, eye protection, and appropriate gloves. Additional PPE may include hearing protection, respiratory protection, faceshield, and other specialized gear. Review the EHS SOPs pertaining to body, eyes/face, foot, hand, and head protection.

Chemical Safety

- Store chemicals in appropriately-designed storage cabinets or areas. Flammables should be stored in flammable liquid cabinets. Flammables requiring refrigeration require specially designed refrigerators. Certain gases require specially designed cabinets. Keep stocks to the minimum necessary to meet short term needs. Ensure that all chemical storage containers have a tight-fitting lid and are stored according to compatibility. For additional guidance, see the EHS SOP, *Compatible Chemical Storage*. All chemical containers must be clearly labeled indicating contents.
- Establish and maintain a current chemical inventory.
- Establish and maintain Safety Data Sheets (SDS) for all hazardous chemicals in the laboratory. Safety Data Sheets may be kept electronically, but must be freely accessible to all lab workers.
- Request a door placard from EHS.
- Prepare a laboratory spill kit. Additional guidance may be found in the EHS SOP, *Preplanning for and Responding to Chemical Spills*.

Radiation Safety

- Use of radioactive material or radiation producing devices must be approved by the Radiation Safety Committee. Contact EHS for instruction and assistance in completing a use application for submittal to the Radiation Safety Committee.

- Complete initial Radiation Safety training and annual refresher training thereafter. Contact the Assistant Radiation Safety Officer at EHS for additional information.
- All radioactive isotopes are ordered, shipped to, and delivered by EHS. Principle investigators are not allowed to receive isotopes from the manufacturer directly.
- Prepare and maintain a Radiation Safety Log Book. This book will contain inventory sheets, isotope use and disposal documentation, lab map, and contamination survey results.
- Ensure proper type and amount of shielding material is present.
- Ensure controls are in place to secure radioactive material to prevent unauthorized removal or access.
- Ensure proper contamination survey equipment is available (e.g., hand-held portable meters, liquid scintillation counter).
- EHS must commission the laboratory space prior to work with radioactive materials.

Biological Safety

- Ensure availability and fitness-for-use of all required engineering controls (e.g., biosafety cabinets, centrifuge safety cups, etc.). Biosafety cabinets must have current (within last 12 months) certification.
- All work with biological materials subject to the **UNL Biosafety Guidelines** (available on the EHS website) requires submission and approval of an Institutional Biosafety Committee (IBC) protocol prior to initiating work.
- Ensure the lab staff are trained in proper biosafety techniques, equipment use, and lab procedures prior to initiating work.
- Prepare and maintain a laboratory biosafety manual. This manual will contain a copy of the approved IBC protocol in addition to other relevant biosafety materials, SOPs, etc. See the EHS SOP *Preparing a Laboratory Biosafety Manual* for guidance.
- Establish and maintain a pathogen inventory, which is required of any researcher who manipulates any human, animal, or plant pathogen, including toxins of biological origins. This inventory should be updated annually as explained in the EHS SOP, *Pathogen Inventories*.
- All biological waste must be properly decontaminated prior to disposal. This is accomplished through steam sterilization (autoclave) or chemical decontamination.
- Sharps must be collected and disposed of in rigid, leak-proof plastic containers. Containers housing sharps which are potentially infectious to humans must be labeled with the Universal Biohazard Symbol.
- Prepare a biohazardous material spill kit. See the EHS SOP, *Spill and Exposure Response for Biohazardous Materials*.
- EHS will conduct a commissioning inspection of the space.

Safety and Compliance Surveys

- Safety and compliance surveys of laboratories are generally conducted **annually** by EHS. Surveys may be conducted more frequently if manipulating radioactive or biohazardous materials, or at the discretion of the EHS director or faculty oversight committee (IBC, RSC, etc.).
- The survey utilizes a checklist (available from EHS) which address specific safety items. Safety concerns should be corrected as soon as possible. Principal Investigators are encouraged to conduct regular self-surveys of their laboratories. Refer to the EHS SOP, *Safety and Compliance Survey Guidelines for Chemical Laboratories* (https://ehs.unl.edu/sop/s-SAG_chemical_lab.pdf). This checklist can also be a useful guide for considerations when setting up a new laboratory.

Re-opening after lab “hibernation”

On rare occasions, laboratory work may be temporarily suspended and the lab put into a hibernation mode. When returning the lab to a state of operation, consider the following:

- Survey the laboratory for any damage to facilities or equipment. Document damage and report as appropriate (e.g., UNLPD, BSM, Department Head/Chair, etc.). **DO NOT** enter any lab or work space if unsafe conditions exist (flooding, noxious odors, large chemical spill, smoke, etc.). Call 911 for emergency assistance if necessary.
- Verify current certification/inspection of fume hoods, biological safety cabinets, and fire extinguishers. Verify proper operation of all engineering controls and local alarms.
- Inspect water hoses and pressurized systems for integrity of connections.
- Verify proper functioning of eyewash stations and flush thoroughly.
- Inventory all chemicals. Tag any unwanted or expired chemicals for EHS pickup and disposal. Report any loss, theft, or release immediately to EHS.
- If applicable, inventory all radioactive materials. Report any loss, theft, or release **immediately** to the Radiation Safety Officer. Perform a post “hibernation” contamination survey.
- If applicable, inventory all biohazardous materials. Report any loss, theft, or release **immediately** to the Biosafety Officer. Any biohazardous materials (human materials, pathogens, r/s Nucleic acids, etc.) which are unusable or may have become contaminated should be properly autoclaved or chemically inactivated prior to disposal.
- Review any new or changed university-wide or department-specific policies, procedures, or protocols and implement any needed changes in your laboratory.
- Conduct refresher training to review existing, new, or revised safety procedures, protocols, policies, and/or lab work with lab staff.



Additional References (available online)

- UNL Biosafety Guidelines (EHS website);
- UNL Injury and Illness Prevention Program (EHS website);
- National Research Council. 2011. Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards, Updated Version. Washington, DC: The National Academies Press. <https://doi.org/10.17226/12654>.
- OSHA General Industry Standard 29 CFR 1910.1450