Laboratory Safety Manual 2025

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Introduction

Purpose

1. The Laboratory Safety Manual shall provide policy and guidance related to laboratory safety for West Virginia University (WVU). This manual shall meet applicable federal regulations not limited to West Virginia Department of Environmental Protection (WVDEP), United States Environmental Protection Agency (USEPA), Occupational Safety and Health Administration (OSHA), American National Standards Institute (ANSI), National Fire Protection Association (NFPA), National Institute for Occupational Safety and Health (NIOSH), National Institute of Health (NIH), International Biosafety Committee (IBC) United States Department of Agriculture (USDA), and Center for Disease Control (CDC). The Laboratory Safety Manual shall adhere to the hierarchy of controls. The hierarchy of controls prioritizes intervention strategies based on the premise that the best way to control a hazard is to systematically remove it from the workplace rather than relying on employees to reduce their exposure.

Scope

1. The Laboratory Safety Manual applies to all facilities, students, and employees at WVU who utilize clinical, industrial, research, or academic laboratory settings.

Roles and Responsibilities

West Virginia University Environmental Health and Safety Department

1. The EHS laboratory safety personnel are responsible for overseeing all matters related to laboratory safety on all WVU campuses. This includes the development, implementation, and oversight of the Laboratory Safety Program.
2. Laboratory Safety works in conjunction with WVU EHS to address all safety and health concerns related to issues across campus. Laboratory Safety is responsible for the following services:
    a. Fume Hood Testing: EHS Laboratory Safety oversees annual fume hood testing to ensure that all fume hoods on all campuses are compliant and in good working order.
    b. Eyewash Testing: EHS Laboratory Safety oversees annual eyewash testing to ensure that all eyewashes on all campuses are compliant and in good working order.

c. Safety Shower Testing: EHS Laboratory Safety oversees annual safety shower testing to ensure that all safety showers on all campuses are compliant and in good working order.
d. Laboratory Audits: EHS Laboratory Safety's audit program is completed annually. All findings will be immediately emailed to the PI's, other lab staff, and Chemical Hygiene Officers (CHOs) with a correction deadline.
e. Information and Consultation: EHS Laboratory Safety is always available for providing information or consultation to faculty, staff, and students across the University to help make safety the number one priority of research and student's learning experiences.

Principal Investigators, Researchers, Department Managers/ Supervisors

1. Responsible for ensuring that all work being performed within their laboratory is performed in compliance with Federal and University regulations, policies, and guidelines, including the Laboratory Safety Manual.
2. Effectively communicate the requirements for working in a laboratory to their personnel and students.
3. Ensure that all personnel and students are provided effective information and training on laboratory physical or health hazards.
4. Review laboratory procedures for potential safety issues prior to conducting them.
5. Ensure that PPE is available and properly used by each laboratory employee, student, and visitor.
6. Maintain and implement safe laboratory practices.
7. Perform regular housekeeping inspections, including routine inspections of emergency equipment.
    a. Laboratories are responsible for inspecting and flushing (3 minutes) their eyewashes weekly. Print and post the Weekly Eyewash Station Maintenance log (in the lab safety flyer attachment) near the lab's eyewash.
8. Monitor the facilities, laboratory equipment, and emergency equipment to ensure that they are maintained and function properly.
    a. Safety Eyewashes - If at any time lab members suspect that an eyewash is not working properly (i.e., low flow in one or both eyelets, extreme hot and cold temperatures), EHS must be promptly contacted to assess the unit to bring it back into compliance.
    b. Fume Hoods - If at any time lab members suspect that a fume hood is not working properly (i.e., turbulent airflow, low or high face velocity, unusual noises, no flow, monitor in alarm), EHS must be promptly contacted to assess the hood to bring it back into compliance.

Faculty, Staff, and Students

1. Faculty, staff, and students will abide by all policies and procedures set forth in the Laboratory Safety Manual and will complete all applicable safety training and medical surveillance.
2. Read, understand, and follow all safety rules and regulations that apply to the work area.
3. Promote good housekeeping practices in the laboratory or work area.
4. Notify the supervisor of any hazardous conditions or unsafe work practices in the work area.

5. Use appropriate PPE for each procedure.
6. Ensuring that all University and departmental or office safety policies and procedures are adhered to as well as complying with safety directives issued by their supervisors.
7. Ensuring compliance with all health and safety standards and regulations promulgated by regulatory agencies.
8. Attend and/or complete required safety trainings before or by the date they are required.
9. Raise safety concerns to immediate supervisors to ensure that the supervisory chain of command is utilized. If this method is unsuccessful, contact EHS directly.

Emergency Contact Information

1. University Police – 304-293-3136
2. EH&S Main Phone Number – 304–293–3792
3. Emergency Response
    a. John Hando – 304-293-5799
    b. Jim Bittner 304-2933-3136
4. Laboratory Safety Personnel - https://www.ehs.wvu.edu/about-us/staff/health-sciences-center-safety-office
    a. EHSLabSafety@mail.wvu.edu
5. Hazardous Materials - https://www.ehs.wvu.edu/about-us/staff/hazardous-materials-staff
    a. EHS_Chemicals@mail.wvu.edu
6. Chemical Hygiene - https://www.ehs.wvu.edu/about-us/staff/chemical-hygiene
    a. ChemicalHygiene@mail.wvu.edu
7. Biosafety - https://www.ehs.wvu.edu/about-us/staff/biosafety
    a. biosafety@wvuhsc.onmicrosoft.com

Training Requirements

1. Any individual working in a WVU laboratory—paid, unpaid, faculty, staff, student, trainee, or volunteer—shall complete all required safety training provided by EHS. PI's must be able to produce training records upon request at any time as a requirement of training compliance.
    a. Appendix A - Certificate of Laboratory Training
2. Training will be based on the activities and materials that will be used in the lab and could include hazard communication, hazardous waste, lab safety, biosafety, and others.
3. Departmental safety training that is given and tracked by CHOs shall be shared with the EHS laboratory safety staff.
4. SOLE Required Trainings
    a. Basic Level – All laboratory personnel are required to take this training.
        1. EPA/OSHA Module 1: Hazardous Waste
        2. EPA/OSHA Module 2: Hazard Communication
        3. EPA/OSHA Module 3: Laboratory Safety
        4. EPA/OSHA Modules (Hazardous Waste, Hazard Communication, & Lab Safety) Refresher Training
        5. Liquid Nitrogen Training
    b. Working with Lasers
        1. Laser Safety Training
    c. Working with recombinant DNA.

1. rDNA: Recombinant DNA Training

d. Working with Biohazards
    1. In-personBSL2 Biosafety & Blood Borne Pathogens Training
        a. Scheduled by the Biosafety Team.
e. Visitors may need training dependent on tasks at hand.

Materials Requiring Special Approval

1. There are some research applications that require processes, equipment, and/or materials to be reviewed and approved prior to work beginning. The PI on these projects must initiate the review process.

Particularly Hazardous Substances (PHS)

1. PHSs are broadly defined by OSHA Laboratory Standard (29 CFR 1910.1450) as a carcinogen, reproductive toxin, or an acute toxin. A Standard Operating Procedure 6 (SOP) must be written and approved by EHS before any work that utilizes a PHS can begin.

Department of Homeland Security (DHS) Chemicals of Interest

1. This includes a list of 300+ compounds that are identified as presenting an increased risk of use in acts of terrorism.
2. The list of DHS chemicals is available from the following link: https://www.ecfr.gov/current/title-6/chapter-I/part-27/appendix-Appendix%20A%20to%20Part%2027
3. Please contact John Hando for more information or if there are any questions at 304- 293-5799 or john.hando@mail.wvu.edu .

Drug Enforcement Administration (DEA) Controlled Substance

1. Certain compounds and drugs whose purchase, use, and disposal are strictly controlled require a DEA registration/license. A list of controlled substances is available at the following link: https://www.deadiversion.usdoj.gov/schedules/orangebook/c_cs_alpha.pdf
2. Additionally, some chemicals require additional restrictions that do not require a DEA license. A list of restricted chemicals is available at the following link: https://www.deadiversion.usdoj.gov/schedules/orangebook/f_chemlist_alpha.pdf
3. Please contact Controlled Substance Manager Crys Povenski for additional information at 304-293-6925 or crys.povenski@mail.wvu.edu.
4. West Virginia University Environmental Health and Safety will aid DEA Registrants (License holders) in maintaining compliance with the applicable laws, policies, and procedures through training sessions, consultations, and audits. This includes maintaining copies of registration certificates, renewals, and authorized personnel forms. WVU faculty and staff engaged in research and academic activities involving the use of DEA-controlled substances will be responsible for registering with the DEA and WVBOP and maintaining records with EHS. https://www.ehs.wvu.edu/controlled-substance-use-in-research

Radioactive Material

1. Use of radioactive materials is authorized and approved by WVU's Radiation Safety Office. Contact the Radiation Safety Office at (304) 293-3413 or radiationsafety@hsc.wvu.edu for guidance and approval.

Biological Materials

1. Whether in research or teaching activities, certain biological materials must be registered and approved by the Institutional Biological Safety Committee (IBC).
2. The following is a list of biological materials that require approval:
    a. Recombinant and synthetic nucleic acid molecules as defined by the National Institutes of Health (NIH) Guidelines for Research Involving Recombinant and Synthetic Nucleic Acid Molecules
    b. Infectious and potentially infectious microorganisms and viruses
    c. Human and non-human primate materials
    d. Animal tissues that pose zoonotic disease risks
    e. Biological toxins
3. For assistance with biological materials, contact biosafety@wvuhsc.onmicrosoft.com or visit the biosafety manual site: https://www.ehs.wvu.edu/biosafety/biosafety-manual

WVU Programs

Biosafety Program

1. https://www.ehs.wvu.edu/biosafety/biosafety-manual

Chemical Hygiene Program

1. https://www.ehs.wvu.edu/laboratory-safety/chemical-hygiene-plan

Controlled Substances Program

1. https://www.ehs.wvu.edu/controlled-substance-use-in-research

Compressed Gas Cylinder Safety Program

1. https://www.ehs.wvu.edu/files/d/079bd77b-a852-4f26-822d-3cc5ba9d93eb/compressed-gas-cylinder-safety-program.pdf

Hazard Communication Program

1. https://www.ehs.wvu.edu/files/d/f37a8cfb-021f-4142-84c1-a029bec52aaf/hazard-communication-program-12-19-2017.pdf

IBC – Use of Recombinant or Synthetic Nucleic Acid Molecules

1. https://www.ehs.wvu.edu/biosafety/ibc-overview
2. Appendix B - Institutional Biosafety Committee

IACUC – Animal Care and Use in Research

1. https://animal.research.wvu.edu/policies-and-guidelines

Laser Safety Program

1. https://www.ehs.wvu.edu/files/d/eb5ef3ae-9cb1-4c47-8131-3d533fbe9881/laser-safety-program.pdf

Radiation Safety

1. https://hsc.wvu.edu/rsafety/

Hazard Communication

Laboratory Door Signs

1. Emergency contact signs shall be posted on the doors of all laboratories with hazardous materials.

    a. Emergency telephone numbers of emergency personnel/facilities, supervisors, and laboratory workers.
    b. Location signs for safety showers, eyewash stations, other safety and first aid equipment, and exits; and
    c. Warnings at areas or equipment where special or unusual hazards exist.
        1. 704 Diamond with appropriate warning numbers.
        2. Biological hazard symbol if necessary.
2. These signs should be checked quarterly for accuracy. This is completed with the EH&S CHO team and the PI responsible for the space in coordination with the RMM inventory reconciliation process.

Chemicals in Laboratory – Ease of Access

1. Chemical Procurement, Chemical Inventory, and Safety Data Sheet information can be found at the following link - https://www.ehs.wvu.edu/chemical-procurement-inventory
2. Chemical Labeling information can be found at the following link - https://www.ehs.wvu.edu/files/d/f37a8cfb-021f-4142-84c1-a029bec52aaf/hazard-communication-program-12-19-2017.pdf

Waste Management

1. Chemical Waste - https://www.ehs.wvu.edu/chemical-waste/waste-management
2. Infectious and Biological Waste - https://www.ehs.wvu.edu/biosafety/biosafety-manual
3. Radioactive Waste - https://hsc.wvu.edu/rsafety/

Hazard Assessment

1. Hazard assessments must be completed by specialists in the respective field. Understanding the hazards in your workspace is critical for implementing effective preventative measures and mitigating risks.

Biological Hazards:

1. Biological Hazards are discussed in the Biosafety Manual. The Biosafety Officer should complete risk assessments when biologicals are involved.

Chemical Hazards:

1. Chemical Hazards are discussed in the Chemical Hygiene Plan. The Chemical Hygiene Officer should complete risk assessments when chemicals are involved.

Physical Hazards:

1. Physical hazards are factors in the environment that can cause harm through physical contact or exposure, potentially resulting in injuries or illnesses.
    a. Including slips, trips, falls, exposure to extreme temperature, noise, vibration, as well as hazards related to electricity, confined spaces, radiation, high pressure/energy procedures, sharp objects, and moving equipment.
2. Injuries can result from bodily contact with rotating or moving objects, including mechanical equipment, parts, and devices. Personnel should not wear loose-fitting clothing, jewelry, or unrestrained long hair around machinery with moving parts.
3. Risk assessments may be completed by laboratory personnel but can be completed by laboratory safety specialists upon request.

Health Hazards:

1. Hazards that negatively impact human health. Depending on the severity of the exposure, these hazards can lead to acute or chronic illnesses.
2. The Medical Surveillance Program provides the methods and the means to detect and counsel employees regarding potential and actual work-related adverse health complications.
    a. The Medical Surveillance Program can be found at the following link - https://www.ehs.wvu.edu/files/d/4b30a75c-e751-4fcd-911f-f49967cd6721/medical-surveillance-august22post.pdf
3. The Occupational Health Questionnaire is required for all individuals working with animals in any setting and needs to be updated on an annual basis. Records of occupational health clearance are maintained by WVU Occupational Medicine.
    a. Occupational Health Questionnaire can be found at the following link - https://ohq.hsc.wvu.edu/
4. The Hearing Conservation Program ensures that University faculty, staff, and students who are exposed to hazardous occupational noise levels are adequately protected to prevent hearing loss.
    a. The Hearing Conservation Program can be found at the following link - https://www.ehs.wvu.edu/files/d/7c20a7ae-8243-4e29-b70a-9492d3a94b5b/hearing-conservation-program_rev_4_2016.pdf
5. The Respiratory Protection Program ensures that University faculty, staff, and students are protected against inhalation hazards.
    a. The Respiratory Protection Program can be found at the following link - https://www.ehs.wvu.edu/files/d/a7faa357-c54f-41dd-a351-910164bbc620/respiratory-protection-program-2017-final-draft.pdf
6. Ergonomic Hazards are physical factors in the workplace that can lead to musculoskeletal injuries. These include repetitive motions, poor posture, excessive force, and prolonged periods in one position.
    a. More information about ergonomics can be found at the following link: https://www.ehs.wvu.edu/files/d/46b1d65f-aab5-4ba2-9f1c-00619c20e8df/ergonomics.pdf

General Laboratory Safety

1. The risk of laboratory injuries can be reduced through adequate training, improved engineering, good housekeeping, safe work practices, and personal behavior.

Attire

1. To protect your skin from splashes, spills, and drips, always wear long pants and closed-toe shoes.
    a. Legs must be covered when working in the laboratory. (For example, shorts, skirts, ripped jeans, or capris should not be worn.)
2. Shirts worn in the laboratory must cover the upper torso and shoulders.
    a. Never wear tank tops, crop tops with mid-section exposed, or mesh tops while completing any type of laboratory work.
3. Clothing must not impede or discourage the use of PPE.

4. Follow your department's specific requirements. Loose clothing (such as overlarge lab coats or ties), inadequate clothing (such as shorts or skirts), torn clothing, and unrestrained hair may pose a hazard in the laboratory.
5. Appendix C – What Not to Wear

Sharps Policy

1. The University's Sharps Policy can be found with the following link - https://www.ehs.wvu.edu/files/d/9fc8c428-c593-47aa-b18b-297af2ba5d9a/wvu-sharps-policy-2023.pdf
    a. Appendix D – Be Sharp About Sharps

Laboratory Glass and Plastics

1. Plasticware should be used instead of glassware whenever possible.
2. Defining Broke Glass Disposal
    a. Clean Broken glass
    b. Pasteur pipettes
    c. Glass slides
    d. Glass vials
    e. The glassware does not need to be broken.
    f. Biohazardous, hazardous or radioactive contaminated glass cannot be discarded as regular broken glass boxes.
    g. For water-soluble chemicals, rinse the remaining traces of chemicals in the sink with plenty of water and then dispose in the glass box.
    h. If the chemical is hazardous, do not rinse the container. It must go out as chemical hazardous waste.

Packaging and Disposal Guidelines

1. Line the broken glass waste box or cardboard box with a plastic trash bag
2. Only fill the bag or container $3/4^{th}$ of the way full.
    a. Obscure any labels shown on the glass.
3. Seal the bag with tape.
4. Close box and tape ALL seams.
5. Place box with the regular trash for disposal
6. Label the box as "Broken Glass Waste"

Broken Glass Waste Supplies

1. To obtain or replenish broken glass waste containers, contact your laboratory safety supplier.
    a. Appendix E – Handling of Broken Glass at HSC

Personal Protective Equipment

1. The potential hazards in a laboratory can arise at any time. This can include accidental spills and splashes of dangerous chemicals, potential contact with biological agents, handling of radioactive materials, etc. Personal protective equipment (PPE) is special equipment used to protect the wearer from specific hazards of a hazardous substance. PPE is not a substitute for good engineering or administrative controls or good work practices but should be used in conjunction with these controls to ensure the safety and health of employees. PPE does not reduce or eliminate the hazard; it only protects the wearer.

a. PPE in laboratories includes eye, face, and foot protection, as well as gloves and protective clothing. The need for PPE is dependent upon the type of operations and the nature and quantity of the materials in use and must be assessed on a case-by-case basis. Workers who rely on PPE must understand the functioning, proper use, and limitations of its uses.
b. To avoid potentially hazardous situations, each laboratory must conduct a hazard assessment to identify the hazards and select the most appropriate type of PPE for protection. Hazard assessments are typically conducted by the Principal Investigator and should be documented. After a determination of the hazards is completed, this information is used to select the most appropriate PPE.
c. Labs are responsible for purchasing PPE and providing PPE to anyone working or volunteering within their lab. PPE requirements are based on the hazards used in the lab. For guidance on PPE, contact the Lab Safety group or the Biosafety group.

Eye Protection

1. Safety Glasses
    a. Safety glasses must meet ANSI standard Z87.1.
    b. Safety glasses effectively protect the eye from solid materials (dust and flying objects) but are less effective at protecting the eyes from chemical splashes.
    c. Safety glasses are required for general working conditions where there may be minor dust, chips, or flying particles.
    d. Safety glasses with side protection such as side shields or wraparound style are required where there is a potential of being struck by projectile flying objects such as:
        1. Chiseling
        2. Drilling
        3. Machining
        4. Milling
        5. Fastening (e.g. staple gun)
        6. Grinding or abrasive wheels
        7. Cutting (e.g. power saws)
        8. Power-actuated tools
        9. Turning
    e. Use safety glasses treated for anti-fog.
2. Safety Googles
    a. Chemical goggles form a liquid-proof seal around the eyes, protecting them from splashes.
    b. Goggles should be worn in situations where there is potential for chemical fumes, splashes, mists, sprays, or dust exposure to the eyes.
    c. Goggles for splash or fine dust protection should have indirect venting. Use direct-vented goggles for less fogging when working with large particles.
    d. Safety goggles designed after ski-type goggles with high air flow minimize fogging while providing better particle and splash protection.
3. Face Shield

a. Goggles with a face shield are required when handling highly reactive substances or large quantities of hazardous chemicals, corrosives, poisons, hot chemicals, projectiles, or radiant energy.
b. Face shields are not a substitute for eye protection.
c. Always wear safety glasses or goggles under a face shield.
d. Use face shields for highest impact and full-face protection for spraying, chipping, grinding, and critical chemical or biohazards.
e. Face shields may be tinted or metal coated for heat and splatter protection. The curve of the face shield will direct particles or chemicals coming from the side into the eyes.

4. Contact Lenses
    a. Contact lenses may be worn in the laboratory, but they do not offer any protection from chemical contact. If a contact lens becomes contaminated with a hazardous chemical, rinse the eye(s) using an eyewash and remove the lens immediately. Contact lenses that have been contaminated with a chemical must be discarded.

Hand Protection

1. Gloves
    a. Protective gloves should be worn when handling hazardous materials, chemicals of unknown toxicity, corrosive materials, rough or sharp-edged objects, and very hot or very cold materials.
    b. When handling chemicals in a laboratory, disposable nitrile gloves are usually appropriate for most circumstances. These gloves will offer protection from incidental splashes or contact.
    c. When working with chemicals with high acute toxicity, working with corrosives in high concentrations, handling chemicals for extended periods of time, or immersing all or part of a hand into a chemical, the appropriate glove material should be selected based on chemical compatibility.
    d. Disposable gloves must never be reused. It is important that once a glove is used, it is disposed of correctly and never disinfected or decontaminated for additional use.
    e. When selecting the appropriate glove, consider the following:
        1. Degradation Rating
            a. Degradation is the change in one or more of the physical properties of a glove caused by contact with a chemical.
            b. Degradation typically appears as hardening, stiffening, swelling, shrinking, or cracking of the glove.
            c. Degradation ratings indicate how well a glove will hold up when exposed to a chemical.
            d. When looking at a Chemical Compatibility Chart, degradation is usually reported as E (excellent), G (good), F (fair), P (poor), NR (not recommended), or NT (not tested).
        2. Breakthrough Time
            a. Breakthrough Time is the elapsed time between the initial contact of the test chemical on the surface of the glove and the analytical detection of the chemical on the inside of the glove.

b. For mixtures, it is recommended that the glove material be selected based on the shortest breakthrough time.

3. Permeation Rate
    a. Permeation Rate is the rate at which the test chemical passes through the glove material once breakthrough has occurred and equilibrium is reached.
    b. Permeation involves absorption of the chemical on the surface of the glove, diffusion through the glove, and desorption of the chemical on the inside of the glove.
    c. Resistance to permeation rate is usually reported as E (excellent), G (good), F (fair), P (poor), and NR (not recommended). If a chemical breakthrough does not occur, then the permeation rate is not measured and is reported as ND (none detected).
4. Safety Data Sheet Recommendation
    a. SDS Section 8 provides general recommendations for PPE when handling hazardous chemicals.

f. Appendix F – Glove Removal

Hearing Protection

1. The University's Hearing Conservation Program can be found at the following link - https://www.ehs.wvu.edu/files/d/7c20a7ae-8243-4e29-b70a-9492d3a94b5b/hearing-conservation-program_rev_4_2016.pdf

Respirators

1. The University's Respiratory Protection Program can be found at the following link - https://www.ehs.wvu.edu/files/d/a7faa357-c54f-41dd-a351-910164bbc620/respiratory-protection-program-2017-final-draft.pdf

Protective Clothing

1. All personnel must wear appropriate clothing that prevents direct contact of materials with the skin.
2. Task-appropriate garb will be determined by risk assessment.
    a. If risk assessment indicates a need for full-body protection, carefully inspect PPE before each use and ensure proper fit and that it functions for the purpose for which it is intended.
3. Protective Clothing - Lab coats, gowns, coveralls, Tyvek suits.
    a. Protective clothing comes in a variety of materials, each effective against hazards, such as:
        1. Paper-like fiber is used for disposable suits to protect against dust and splashes.
        2. Treated wool and cotton adapt well to changing temperatures, are comfortable and fire-resistant, and protect against dust, abrasions, and rough and irritating surfaces.
        3. Duck is a closely woven cotton fabric that protects against cuts and bruises when handling heavy, sharp, or rough materials.
        4. Leather is often used to protect against dry heat and flames.
        5. Rubber, rubberized fabrics, neoprene, and plastics protect against certain chemicals and physical hazards. When chemical or physical hazards are

present, check with the clothing manufacturer to ensure that the material selected will provide adequate protection against the specific hazard.

Working Alone

1. Working alone in a laboratory is dangerous and should be avoided. Workers should coordinate schedules to avoid working alone. If working alone cannot be avoided, a check-in system should be established via phone or in person until the work is complete.

Hand Washing

1. Hands should be washed with soap and water immediately after working with any laboratory agents, even if gloves have been worn.
    a. Washed for a minimum of 20 seconds using warm to hot water.

Food and Drink

1. Mouth-pipetting is prohibited. Mechanical pipetting devices should be utilized.
2. Eating, drinking, smoking, gum chewing, applying cosmetics, and taking medicine in laboratories where hazardous chemicals or agents are used or stored should be strictly prohibited.
3. Food, beverages, cups, and other drinking and eating utensils should not be used or stored in areas where hazardous chemicals or agents are handled or stored.

Housekeeping

1. Housekeeping can help reduce or eliminate a number of laboratory hazards. Proper housekeeping includes appropriate labeling and storage of chemicals, safe and regular cleaning of the facility, and proper arrangement of laboratory equipment.
2. Keeping laboratories clean and organized helps provide a safer laboratory. The following items are steps to take to keep the laboratory clean and organized.
    a. Keep drawers and cabinet doors closed and electrical cords off the floor to avoid tripping hazards.
    b. Keep aisles clear of obstacles such as boxes, chemical containers, and other storage items that might be put there, even temporarily.
    c. Avoid slipping hazards by cleaning up spilled liquids promptly and keeping the floor free of items.
    d. Never block or even partially block the path to an exit or to safety equipment such as a fire extinguisher or safety shower and eyewashes.
    e. Make sure that supplies and equipment on shelves provide sufficient clearance so that fire sprinkler heads operate correctly. There shall not be any storage within 18 inches of a sprinkler head.
    f. Hazardous Chemicals should not be stored over 5 feet or above eye level.
    g. Inventory laboratory supplies so as to not over-order items.
        1. Only order the necessary number of items needed for ongoing projects.
        2. Perform annual laboratory clean out for unused, unneeded, or expired items.
    h. Ensure overhead lights are in working order.
    i. Ceiling tiles should always be in the appropriate place for fire safety and security.

Decontamination of Workspace

1. Work surfaces and chairs should be made of non-porous materials that are chemically resistant, smooth, and can be decontaminated. Hand-washing sinks for hazardous materials may require elbow, foot, or electronic controls for safe operation.

2. Wet laboratory areas should have chemically resistant, impermeable, slip-resistant flooring.
3. Walls should be finished with a material that is easy to clean and maintain.
4. Operable windows should not be present in laboratories.

Machine Guarding

1. One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks. Guards must be affixed to machines where possible and secured elsewhere if, for any reason, attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard.

Laboratory Equipment

Safety Equipment

1. Safety equipment, including spill control kits, safety shields, fire safety equipment, PPE, safety showers and eyewash units, and emergency equipment should be available in well-marked, highly visible locations in all laboratories.
2. All employees should understand the following safety information:
    a. Locations of all emergency equipment.
    b. What the employee should do in the event of an emergency.
    c. Proper operations of emergency flushing stations.

Emergency Eyewashes

1. Eyewashes must be installed where the eyes or body of any person may be exposed to injurious, corrosive materials and in labs that work with biohazards at the BSL2 level or higher.
2. Suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.
3. Requirements:
    a. Eye wash and safety showers must always have a clear path and shall not be used as a storage area.
    b. Must be accessible within 10 seconds of the hazard.
    c. Plumbed eye wash and safety shower water must be tepid (60- 100˚F).
    d. Continuous flow must be hands-free flushing.
4. Eye washes can be found in the form of a drench hose, shower and eye wash combination unit, solution/squeeze bottle, and/or a gravity-fed box.
5. Laboratories are responsible for flushing eye washes weekly for, at minimum, 3 minutes to ensure proper working order and that the lines are free from debris and sediment.
    a. Once lab staff has inspected and flushed the eye wash, it must be recorded on an eye wash station maintenance log (included in attachments).
        1. Appendix G – Bump Testing Eyewashes
        2. This maintenance log must be displayed in a visible location.
            a. Appendix H – Eyewash Maintenance Log
        3. If anything is suspected to be wrong with an eye wash, laboratory safety must be notified immediately for testing and to remedy any issues quickly.
6. How to use eyewash in the event of an emergency:

a. Immediately go to the nearest eyewash station in the event of a chemical splash or burn.
b. Activate the unit – the unit should stay activated with hands free.
c. While lightly holding your eyes open, gently roll your eyes from left to right and up and down to be sure all areas of the eyes are being flushed.
d. Flush for a full 15 minutes at minimum – any less time does not accomplish dilution of the chemical.
e. If wearing lenses, remove them while flushing! Chemicals can be trapped underneath contacts.
f. Seek medical attention after flushing appropriately.

Emergency Showers

1. Showers must be installed where the eyes or body of any person may be exposed to injurious, corrosive materials and in labs that work with biohazards at the BSL2 level. Suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.
2. Safety showers are inspected and tested annually by WVU EH&S laboratory safety.
3. If anything is suspected to be wrong with a safety shower, laboratory safety must be notified immediately for testing and to remedy any issues quickly.
4. Appendix I – Safety Showers and Eyewashes

Fire Extinguisher

1. Portable fire extinguishers are available in the event of a fire incident. Please make yourself aware of your closest fire extinguisher as the placements may be different in different locations.
    a. Appendix J – Portable Fire Extinguishers

Fume Hoods

1. A fume hood, when installed, maintained, and used properly, can offer a substantial amount of protection to the user from chemical hazards.
2. Annual Testing
    a. All fume hood testing is performed by a laboratory safety representative.
    b. The test performed is a quantitative evaluation - face velocity measurement.
        1. Test air flow when the sash is at a height of 18 inches.
        2. Calculate average face velocity at 18 inches
            a. The number of face velocity measurements taken are dependent on the length of the fume hood.
        3. If the average face velocity is in the range of 75 fpm – 125 fpm, the unit has PASSED.
        4. If the unit FAILED, the quantitative evaluation:
            a. A safety representative will place a “Chemical Fume Hood Out of Service” label on the sash.
            b. Out of Service fume hoods must not be used.
            c. Laboratory safety will then submit a work order for fume hood maintenance.
            d. After any repair or maintenance, the fume hood must be retested before resuming to work in the hood.
    c. Laboratory hoods used to prevent harmful exposures are required to be tested or retested:

1. Annually, at a minimum
2. Whenever there is a " FAILED" sticker
3. Whenever a laboratory hood has been modified
4. Whenever the exhaust duct system connected to a hood has been modified
5. Whenever the hood has been relocated

d. Laboratory fume hood performance can be compromised by the following factors:
    1. Equipment blocking airflow to slots in baffle.
    2. Equipment placed within 6 inches from the plane of hood face.
    3. Hood sash or panels not replaced after equipment setup completed.
    4. Cross drafts - can be due to ventilation supply ducts or blowers/exhaust related to nearby equipment.
    5. Worker leaning into the hood.
    6. Leaks in exhaust ducting.
    7. Turning off the hood fan during hood use.
e. If the users, at any time, feel that the fume hood is not working properly, laboratory safety should be immediately contacted for testing and to remedy any issues quickly.
f. Fume hoods shall never be modified, added, or replaced without approval from Facilities and EHS.

Perchloric Fume Hoods

1. Perchloric Fume Hoods are essential for minimizing risks associated with perchloric acid use and ensuring a safe working environment.
2. Have wash-down capabilities to prevent the buildup of explosive perchlorate salts within the exhaust systems.
3. Additionally, they have specialized ventilation systems designed for safe handling of perchloric acid due to its corrosive and explosive nature, especially when heated.

Ductless Fume Hoods

1. They are used only in situations with minimal danger. These types of fume hoods filter laboratory air and then recycle it.

Laminar Flow Cabinet

1. A ventilated, partially enclosed cabinet primarily intended to provide filtered airflow over the work surface by use of laminar airflow methods.

Biological Safety Cabinets

1. A biosafety cabinet is designed to filter biological aerosols using a HEPA filter. Any procedure involving biohazards that could produce an aerosol should be performed within a biosafety cabinet.
    a. Unless it is hard ducted to the building exhaust (B2 type biosafety cabinet), the biosafety cabinet should not be used for protection against chemical fumes or hazardous gases.
    b. Refer to WVU Biosafety Manual Equipment Chapter 7 for guidance on biosafety cabinet certification.
2. Some hoods require specialty certification from a qualified outside vendor. All hoods are required to be recertified annually.
3. This includes but is not limited to acid wet benches, ductless fume hoods, laminar flow cabinets, and biosafety cabinets.

Environmental Rooms or Chambers

Cold rooms

1. Cold rooms are an essential component of many biomedical and clinical research laboratories. They are typically used for temperature-sensitive storage, incubation, and analytical processing.
    a. Appendix K – Cold Room Guidelines
2. As cold rooms are usually shared among multiple labs, they create unique challenges to ensure a clean and safe environment is maintained.
    a. Given the cold and damp environment in cold rooms, mold growth is one of the most common occupational hazards encountered.
    b. Each lab that utilizes the cold room must take responsibility for maintaining the room.
3. Controlling the environment:
    a. To minimize excess moisture from entering a cold room, it is imperative to keep the cold room door firmly shut.
    b. Spills or standing water should be promptly cleaned.
    c. Do not store non-essential items in the cold room.
        1. Only those items that are needed should be brought into the cold room.
    d. Shelving and other storage items must be made from plastic or metal.
    e. Cellulose-based (cardboard, paper, wood, etc.) materials are NOT permitted to be stored in the cold room.
        1. This is the primary cause of mold contamination within a cold room.
    f. If these guidelines are not followed, mold remediation is the responsibility of the labs utilizing the cold room.
    g. Plastic totes or tubs must be utilized in place of cardboard boxes.
        1. Necessary paper products (Kimwipes, paper towels, etc.) may be stored in the cold room if they are stored within a closed, air-tight plastic container.
4. Laboratory's role in cold room maintenance
    a. Monthly surface disinfection within the cold room is recommended as best practice; however, at a minimum, it must be performed quarterly.
    b. This should include all inner surfaces of the room, lab bench, chairs, storage/shelving, and inlet and exhaust grills of the cooling blower.
    c. A fungicidal disinfectant, such as Peroxigard (Rescue), is optimal, as it will not damage metal surfaces.
        1. However, any fungicidal disinfectant is acceptable if an appropriate contact time is achieved.
    d. A 10% bleach solution is effective to kill visible, vegetative mold; however, it does not kill mold spores.
    e. Bleach residue is corrosive to metal surfaces.
        1. Following the use of bleach, any metal surfaces must be wiped with water to remove any bleach residue.
    f. Following disinfection, all surfaces should be wiped dry, so excess moisture does not remain in the cold room.
    g. A quarterly assessment of cold room inventory should be performed.

1. During this assessment, all expired items, items that are no longer needed within the room, and any items with visible mold contamination must be removed or discarded.

5. Dry Ice, Liquid Nitrogen, and Compressed Gas should not be stored in cold rooms as they may displace oxygen.
6. Food or Drink is not permitted within the cold room.
7. Flammable liquids and gasses are not permitted due to the potential for accumulation of vapors creating an explosive atmosphere.

Warm rooms

1. Warm rooms are primarily used for the growth of cells and organism storage but may also be used for general chemistry and biology.
2. The same precautions should be followed as with cold rooms.

Clean Rooms

1. Cleanrooms are used in industry when particles can adversely affect a process in various types of manufacturing. WVU has cleanrooms operated by various departments across campus.

Freezer and Refrigerators

1. Laboratory refrigerators, ice machines, cold rooms, and ovens should not be used for food storage or preparation.
2. Laboratory equipment should be clearly identified for laboratory use only.

Centrifuges

1. Centrifuges, which operate at high speeds, have a great potential for injuring the user if not operated properly.
2. To avoid incidents, personnel should follow the manufacturer's operating instructions for each make and model of centrifuge that is used.
3. The following are safe steps for operating a centrifuge:
    a. Ensure that the centrifuge bowls and tubes are dry.
    b. Ensure that the spindle is clean.
    c. Use matched sets of tubes, buckets, and other equipment.
    d. Always use safety centrifuge cups to contain potential spills and prevent aerosols.
    e. Inspect tubes or containers for cracks or flaws before using them.
    f. Avoid overfilling tubes or other containers (e.g., in fixed angle rotors, centrifugal force may drive the solution up the side of the tube or container wall).
    g. Inspect the rotor to ensure rotor has not exceeded the manufacturer recommended lifespan.
    h. Ensure that the rotor is properly seated on the drive shaft.
    i. Make sure that tubes or containers are properly balanced in the rotor.
    j. Only check O-rings on the rotor if you are properly trained.
    k. Apply vacuum grease in accordance with the manufacturer’s guidelines.
    l. Do not exceed the rotor’s maximum run speed.
    m. Close the centrifuge lid during operation.
    n. Make sure that the centrifuge is operating normally before leaving the area.
    o. Make sure that the rotor has come to a complete stop before opening the lid.
    p. When centrifuging infectious materials, wait 10 minutes after the rotor comes to a complete stop before opening the lid.

Bunsen burners, alcohol burners, and micro incinerators

1. When possible, use alternative methods for procedure sterility.
    a. Open flames are neither required nor recommended in the near microbe-free environment of a biological safety cabinet.
        1. An open flame in a BSC creates turbulence that disrupts the pattern of HEPA-filtered air being supplied to the work surface.
        2. When deemed necessary and approved by the appropriate facility authorities after a thorough risk assessment, touch-plate micro burners equipped with a pilot light to provide a flame on demand may be used.
        3. Internal cabinet air disturbance and heat buildup will be minimized. The burner must be turned off when work is completed.
        4. Small electric furnaces are available for decontaminating bacteriological loops and needles and are preferable to an open flame inside the BSC.
            a. Disposable loops should be used whenever possible.

Cryostat/ Microtome

1. Specimen preparation using cryostats or microtomes involves handling very sharp blades, posing a significant risk of injury. Additionally, working with unfixed biohazard specimens increases the risk of exposure to infectious materials. Proper preparation, handling, and decontamination are essential to minimize these risks.
    a. All individuals operating the equipment must be trained before using the equipment.
    b. Always use the provided finger guards or protective equipment when adding or removing the samples.
    c. Always use forceps or specialized tools to remove the blade and wear cut-resistant gloves.
    d. Always decontaminate the equipment after use and in between users.
        1. 10% bleach with a 70% ethanol rinse may be used to decontaminate but can be corrosive. EH&S is available to assist with alternative and less corrosive disinfectant options based on the agents used.

Chemical Spill Kits

1. Chemical spill kits are provided for free by EHS.
    a. EHS-provided kits are sufficient the majority of the time. On unique occasions, specialized kits are needed for chemicals like hydrofluoric acid, elemental mercury, and concentrated acids/bases.
2. If a spill kit is needed or needs an item replenished, contact the hazardous materials group.
    a. Appendix L – Request a Spill Kit

Laboratory Equipment Disposal Guidance

Freezer:

1. To defrost freezers for routine maintenance or disposal, laboratories should first contact EH&S and Facilities Management.
    a. Appendix M - Equipment Defrosting Information
2. The laboratory must decontaminate the outside of the freezer with an approved disinfectant before FM will move the freezer.

    a. Once this has been completed, EHS must sign off on the decontaminated equipment before FM will move the freezer.
3. FM will coordinate with the laboratory to move the freezer to an appropriate area to thaw.
4. If contents are suspended in ice, laboratory personnel must attend the entire defrosting period to appropriately discard the contents.

Biosafety Cabinet:

1. Prior to moving a BSC to a different location, contact the Biosafety Office. The BSC will need to be gas decontaminated by a qualified, outside vendor and verified by the Biosafety office as decontaminated.
    a. Appendix N - Equipment Decontamination Certification

Chemicals in Laboratory – Ease of Access

1. Chemical Procurement, Chemical Inventory, and Safety Data Sheet information can be found at the following link - https://www.ehs.wvu.edu/chemical-procurement-inventory
2. Chemical Labeling information can be found at the following link - https://www.ehs.wvu.edu/files/d/f37a8cfb-021f-4142-84c1-a029bec52aaf/hazard-communication-program-12-19-2017.pdf
    a. Appendix O – Chemical Storage and Proper Labeling
3. Compressed gas cylinders
    a. Compressed gas cylinders must be secured in an upright position and affixed to a permanent fastener.
    b. For more information on compressed gas cylinders, refer to the compressed gas cylinder program: https://www.ehs.wvu.edu/files/d/079bd77b-a852-4f26-822d-3cc5ba9d93eb/compressed-gas-cylinder-safety-program.pdf

Waste Management

1. Chemical Waste - https://www.ehs.wvu.edu/chemical-waste/waste-management
    a. Appendix P – Chemical and Hazardous Waste Disposal Form
    b. Appendix Q – Waste Manager Guide
2. Infectious and Biological Waste - https://www.ehs.wvu.edu/biosafety/biosafety-manual
    a. Appendix R - Biohazard Waste
3. Radioactive Waste - https://hsc.wvu.edu/rsafety/

Incident Response

Campus Emergency Procedures for Research Laboratories

    a. Appendix S – Campus Emergency Procedures

1. Before beginning an experiment, know your facility's policies and procedures for how to handle an accidental release of a hazardous substance, a spill or a fire.
    a. Emergency response planning and training are especially important when working with highly toxic compounds.
    b. Know the location of all safety equipment and the nearest fire alarm and telephone.
    c. Emergency telephone numbers should be posted in a prominent area.

2. In addition to laboratory safety issues, laboratory personnel should be familiar with established facility policies and procedures regarding emergencies. Topics may include, but are not limited to:
    a. Evacuation procedures—when it is appropriate and alternate routes.
    b. Emergency shutdown procedures—equipment shutdown and materials that should be stored safely.
    c. Communications during an emergency—what to expect, how to report, where to call or look for information.
    d. Shelter in place—when it is appropriate.
    e. Laboratory-specific protocols relating to emergency planning and response.
3. In case of an emergency, call University Police at 304-293-3136 or call 911.
    a. Provide your name, the location of the incident, the nature of the incident, and the number of people affected.

Injury and Illness

1. Chemical or Biological Exposures
    a. If any injuries occur while working on WVU property, follow the procedure in Appendix U - Exposure Response in the Lab.
    b. Appendix T – Exposure Response in the Lab
2. Appendix U – WVU Employee Injurious/ Incident Report
3. Appendix V – Student or Visitor Accident Report Form

Spill Response

1. Chemical Spill
    a. If a chemical spill should occur, a quick response with a stocked chemical spill kit will help minimize potential harm to personnel, equipment, and laboratory space.
    b. Employees who work in laboratories should be familiar with the properties and hazards of materials with which they work. In the event of a small chemical spill, the individual(s) who caused the spill is responsible for a prompt and proper clean up. I
    c. t is also their responsibility to have spill control and personal protective equipment appropriate for the chemicals being handled readily available.
    d. If any spills occur, please contact University Police at 304-293-3136
2. Biological Spills
    a. For biological spill reference, https://www.ehs.wvu.edu/biosafety/biohazardous-incident-reporting

Fires and Explosions

1. Evacuate if the fire alarm sounds in your area.
2. If you discover a fire:
    a. Activate fire alarm.
    b. Close doors as you leave.
    c. Follow the exit signs and use the stairs if needed. Do not use elevators.
    d. Evacuate to your departments' designated meeting place.
    e. Call 3-4394 or 9-911 after you are in a safe area.
3. Calmly State:
    a. Wait for instructions to be provided by the P.A. system. Remain in the assembly area until given an all-clear announcement.
    b. Leave the campus only if instructed.

Gas Leaks

1. Turn off open flames.
2. Turn off the gas if it is safe to do so. Normally, the valve must be turned clockwise to close it.
3. The emergency shutoff can also be used to stop gas from leaking.
4. Leave the area immediately! Alert others to evacuate the area where you suspect the gas is leaking.
5. Do not operate the fire alarm. Do not operate lights, appliances, telephones, cell phones, or any other electric appliances. Sparks from these sources can trigger an explosion or fire.
6. Report the leak after you are in a safe area to 3-4394 or 9-911.
7. Do not return to the building or area until "All Clear" has been issued.

Other Hazardous Materials

1. Dry Ice
    a. Dry ice is the solid form of carbon dioxide that is available in flakes, pellets, or block form and is non-combustible. Dry Ice will sublime (vaporize directly to the gas state) at a temperature of -78.5C (-109.3F) or higher. Hazards associated with the use of dry ice include asphyxiation and burns. The use of dry ice in poorly ventilated areas can result in the depletion of the oxygen level, resulting in asphyxiation. Exposed skin should be protected from contact with dry ice to prevent burns.
    b. Controls
        1. Dry ice is to be stored in a well-ventilated location and placed in a Styrofoam box, chest, insulated cooler, or special cooler designed for the storage of dry ice.
        2. Because of the thermal expansion of dry ice, do not store it in a tightly sealed container.
        3. Do not touch dry ice. Wear appropriate PPE, listed below, when working with dry ice to prevent burns.
        4. Do not store/use dry ice in confined areas with limited ventilation. This includes cold rooms, walk-in refrigerators, environmental chambers, or rooms without ventilation.
        5. Do not leave dry ice unattended in open areas.
        6. Make sure containers are properly labeled.
    c. PPE
        1. Safety goggles, cryogenic gloves, a lab coat, or a lab apron must be worn when handling dry ice.
    d. Disposal
        1. Once dry ice is no longer needed, open the container and leave it at room temperature in a well-ventilated area, such as an operating fume hood, so that the remainder will sublime away.
        2. Never dispose of dry ice in a sink or toilet. The temperature difference can damage the plumbing.
        3. Never dispose of dry ice in the trash, garbage, or chemical waste containers.

4. Never leave surplus dry ice in an unsecured area.

e. Reference Appendix X - Dry Ice Reminders for a laboratory printout.

Inspections

1. The goal of the audits is to promote a culture of safety, reduce the risk of injury to researchers and students, protect WVU property, and ensure compliance with Federal, State, and University rules and regulations.
    a. The audit program also serves to promote a positive working relationship between EH&S and the laboratory researchers to reduce fines and actions from outside regulatory agencies.
2. The hazards present within the laboratory will determine the inspection requirement.
    a. Laboratory safety will complete annual audits for high hazard laboratories
    b. Departments may be required to complete self-audits annually upon risk assessment by laboratory safety.
3. Notice of the inspection will be given to the departmental CHOs and other integral individuals when lab audits are scheduled.
4. During these audits, the applicable areas of safety to be reviewed will include:
    a. Documentation
    b. Housekeeping and General Safety
    c. Chemicals, Chemical Waste, and Labeling
    d. Radiation and Biological Safety
    e. Gas Cylinder Management
    f. Fire, Electrical, Laser, and Equipment Safety
    g. ADA Accessibility
5. If concerns are found, the CHO, PI, and laboratory safety will be sent a report outlining those findings.
    a. It is the responsibility of the PI in conjunction with the CHO to ensure action is taken to correct any deficiencies.
    b. At any time, regulatory agencies can inspect areas.
        1. These agencies can be but are not limited to the following: Department of Environmental Protection (DEP), Drug Enforcement Administration (DEA), local fire officials, Occupational Safety and Health Administration (OSHA), and Centers of Disease Control (CDC)
    c. Either LabcliQ or Campus Optics will be used for reporting and management of the inspection findings by both laboratory safety and the responsible parties.
        1. Appendix Y – Laboratory Safety Audits

Laboratory Relocation, Move-In, and Move-Out

Researcher Onboarding Packet

1. The Researcher Onboarding Packet found in Appendix Z, is provided to newly appointed faculty and laboratory managers who serve as principal investigators and/or supervise research laboratories. This document shall serve as a point of reference to assist key laboratory staff in carrying out duties as supervisors over research personnel and spaces.

Laboratory Relocation Policies and Procedures

1. The Relocation Policies and Procedures found in Appendix AA is to eliminate problems associated with laboratory waste that may create hazards and contribute to compliance issues with regulatory agencies such as the NRC, EPA, DEA, OSHA, NFPA, etc. This guidance addresses the proper disposition of radionuclides, chemicals, equipment, biohazards, laboratory animals, and hazardous materials in the event of relocation of a laboratory.

Laboratory Close-Out Policies and Procedures

1. The Laboratory Close-Out Policies and Procedures can be found in Appendix CC. When leaving WVU, PIs and research staff are responsible for properly closing out their spaces, coordinating with EHS, and utilizing the Laboratory Close-out Procedures packet. This packet includes checklists and paperwork to properly document and close out a lab or prepare and execute an internal move so that nothing is missed.
    a. Appendix BB – Laboratory Close-Out Reminders

Appendix A – Certificate of Laboratory Training

Certificate of Laboratory Training

Department: _____

Date: _____/_____/_____

Employee Trained: _____

Employee Job Title: _____

_____ I understand the procedures that I am expected to perform, and am aware of any potential chemical and or equipment hazards involved in working in this laboratory.

_____ If I have any questions, I will contact the P.I or Laboratory Manager before any chemicals are handled.

_____ I know where the SDSs for the chemicals in this laboratory are located and understand how to read them.

_____ I know the location and how to use safety materials such as the spill kit, eyewash, safety shower, fume hood, fire extinguisher etc.

_____ I understand that my safety depends on the correct use of personal protective equipment such as eye goggles, gloves, lab coats, full shoes etc. I understand how to use and will use this equipment.

_____ I will not use equipment that is malfunctioning and will report the malfunction to the laboratory P.I. or Laboratory manager.

_____ I understand how the chemicals in this laboratory are to be used, stored and disposed of in accordance with all regulations.

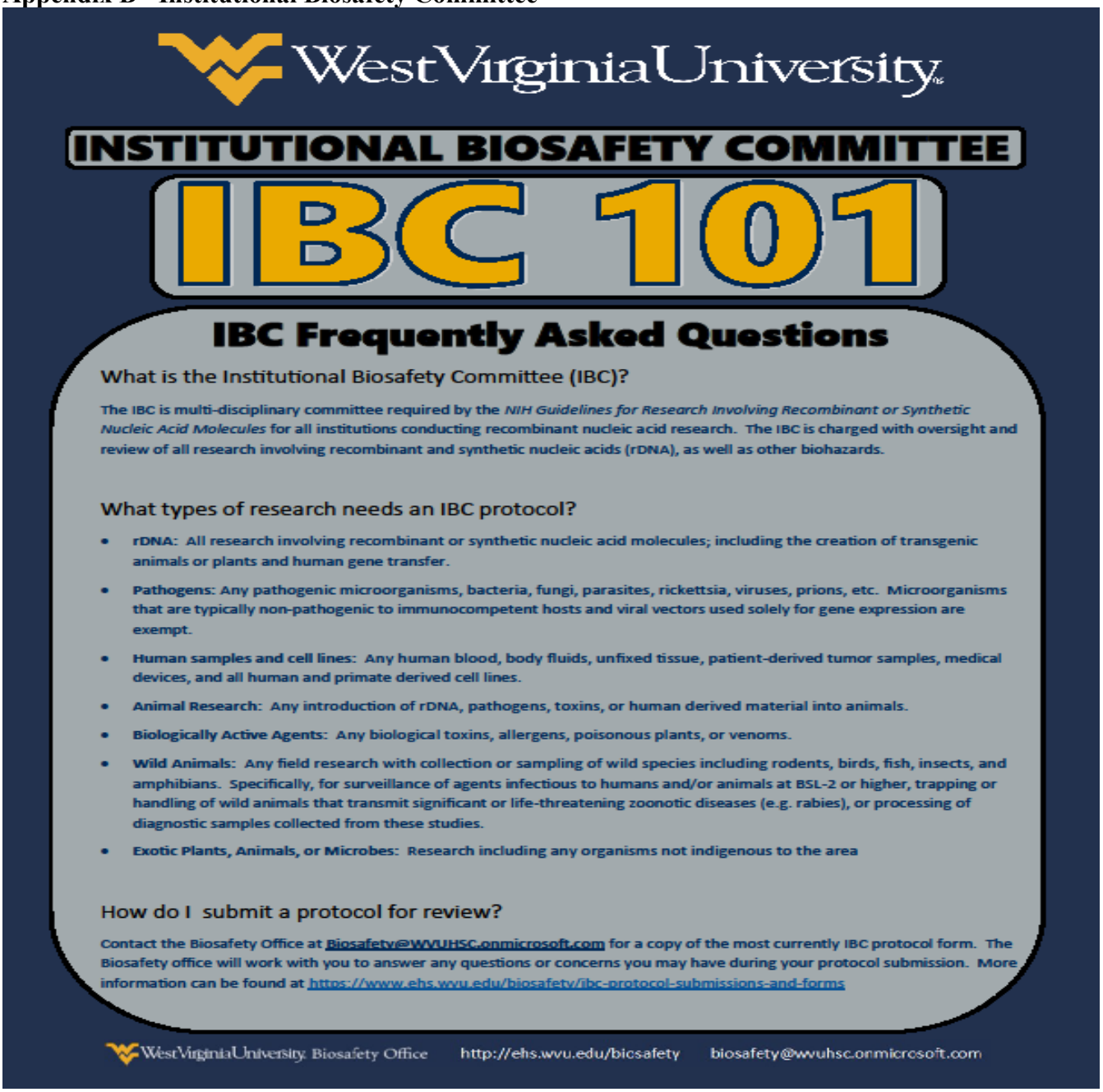
_____

Signature Date

_____

P.I. Signature or Laboratory Manager Signature Date

Appendix B - Institutional Biosafety Committee



Appendix C - What Not to Wear

WHAT NOT TO WEAR

Laboratory Safety Edition

WVU EHS Laboratory Safety

Warm weather is upon us as is wearing our favorite shorts, tank tops, dresses, and sandals. Please remember to keep safety in mind and what proper attire looks like when working in a laboratory setting.

Never wear tank tops, crop tops with mid-section exposed, or mesh tops while completing any type of laboratory work

Never wear shorts, jeans with holes or windows that leave skin exposed, or leave ankles exposed while completing any type of laboratory work

Never wear flip flops, sandals, crocs, or any other shoe exposing any part of the toes or the top of the foot while completing any type of laboratory work

Have questions about lab attire? Ask your lab TA, professor, lab manager or PI for help and guidance on choosing the safest items! For further guidance and questions, contact EHSLabSafety@mail.wvu.edu or your CHO.

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Appendix D - Be Sharp About Sharps

ALL SHARPS must be disposed of in a hard-walled, labeled, sharps container. Biohazardous sharps must go in a red sharps container.

Common sharps include:

- Hypodermic syringes
- Needles
- Razor Blades
- Lancets
- Fingerstick devices
- Broken glass*
- Glass pipettes*

*Uncontaminated broken glass and glass pipettes must be disposed of in a broken glass box.

Sharps must NEVER be placed into the regular trash.

Do Not

- Re-cap needles.
- Place trash in the sharps container.
- Fill containers more than 3/4 full.

Do

- Promptly dispose of all sharps in sharps container.
- Keep sharps containers within close proximity to sharps usage.
- Use a size and shape container that will allow the sharp to freely and completely enter the container.
- Close and seal the top of containers once ¾ full.

West Virginia University
Biosafety Office

BioSafety@WVUHSC.onmicrosoft.com

http://ehs.wvu.edu/biosafety

Appendix E - Handling of Broken Glass at HSC

Handling of Broken Glass at HSC

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Handling of Broken Glass at HSC

Handling Broken Glass at HSC

This applies to the disposal of all laboratory glassware that has not come in contact with any infectious material such as:

- Clean Broken glass
- Pipettes
- Glass slides
- Glass vials

Packaging and Disposal Guidelines

- Line the box with a plastic trash bag
- Only fill 3/4 of the bag or container
- Seal bag with tape
- Close box and tape ALL seams
- Place box with the regular trash for disposal
- Label Broken Glass, if box is not imprinted
- For water soluble chemicals, rinse the remaining traces of chemicals and then dispose in the glass box. The glassware does not need to be broken. Obscure any labels shown on the glass.
- If the chemical is hazardous, do not rinse the container.
- It must go out as chemical hazardous waste.

Important Reminders

- Biohazardous contaminated broken glass will go in a lined biohazardous box and labeled Broken Glass.
- Biohazardous broken glass can either go in a biohazard sharps container or it can be sprayed or soaked with 10% bleach and then placed in the regular broken glass box.
- Broken glass should not be handled with bare hands. Wear either cut proof gloves or use forceps or a dust pan to collect the glass.
- Never take the plastic bag out of the box and transfer to another box.
- No liquid should ever be added to the broken glass box.
- Never push down or smash a garbage bag that is contains broken glass.
- To obtain or replace broken glass waste container contact your laboratory safety supplier or use a sturdy, well-constructed cardboard box/container and line it with a plastic trash bag. Make sure the box is sealed and label as broken glass.

For more information about Broken Glass Disposal access the link below or contact the EHS office at (304)293-0952

https://www.ehs.wvu.edu/hsc/laboratory-safety-hsc/broken-glass-disposal

STAY SAFE!

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Appendix F - Glove Removal

Give Us a Hand

Improper removal of gloves increases the risk of transfer of infectious material to you.

Utilize the "Beak Method" for glove removal every time to minimize contamination risk.

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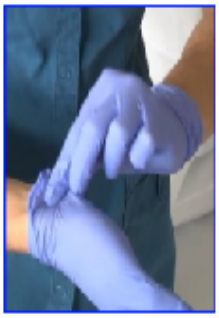
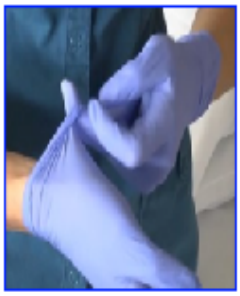
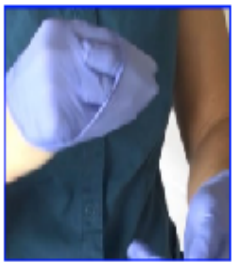
Biosafety Office

Contact us:
BioSafety@WVUHSC.onmicrosoft.com
http://ehs.wvu.edu/biosafety

"Beak Method" Glove Removal Steps		
		
STEP 1: Using one gloved hand, pinch and pull the base of the other gloved hand.	**STEP 2:** Use the middle finger to scoop the cuff of the glove.	**STEP 3:** Pull the glove inside out over all the fingers and thumb to form a "beak."
		
STEP 4: With the beaked hand, pinch the opposite glove at the base and pull the cuff.	**STEP 5:** Roll the glove inside out and off the hand.	**STEP 6:** With the ungloved hand, use the index finger to pull the beaked glove off at the base of the beak and dispose into the appropriate waste container. Always wash your hands after glove removal.

Source: Emory University
http://scholarblogs.emory.edu/ranews/2015/01/01/beak-method-glove-removal-technique/

Appendix G - Bump Testing Eyewashes

BUMP TESTING EYEWASHES

WVU EHS Laboratory Safety

Why is bump testing so important?

Incidents can occur at any moment. Bump testing is important because it actively keeps eyewashes ready for when disaster strikes. Bump testing keeps the eyewash in working order, the lines free of debris, and doesn't allow water to become stagnant.

Bump Testing – How To

1. Bump testing should be performed, at minimum, once weekly
2. Before starting the bump test, do a quick inspection of the area around the eyewash. This area should leave the eyewash easily accessible, free from debris and obstructions, and have the location visibly marked.
3. Once a brief inspection is complete, activate the eyewash for at least 3 minutes or until water runs clear.
4. Once bump test is complete, fill out the weekly bump test log.

Contact WVU EHS Laboratory Safety if you suspect that the eyewash is in need of repair or if a copy of the weekly eyewash log is needed.

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Appendix H - Eyewash Maintenance Log

Weekly Eye Wash Maintenance Log – Year: Location:

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Date																		
The eye wash station is free of obstruction																		
The eye wash is easily activated																		
The eyelets are equipped with eyelet covers																		
Eyelet covers are removed by eye wash activation																		
Adequate water flows actively from both eyelets																		
Flow of water is of equal height from each eyelet																		
Water is clear after flushing																		
The eye wash delivers a steady stream of water																		
Do any repairs need to be made																		
Initials																		

Week	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Date																		
The eye wash station is free of obstruction																		
The eye wash is easily activated																		
The eyelets are equipped with eyelet covers																		
Eyelet covers are removed by eye wash activation																		
Adequate water flows actively from both eyelets																		
Flow of water is of equal height from each eyelet																		
Water is clear after flushing																		
The eye wash delivers a steady stream of water																		
Do any repairs need to be made																		
Initials																		

Week	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Date																
The eye wash station is free of obstruction																
The eye wash is easily activated																
The eyelets are equipped with eyelet covers																
Eyelet covers are removed by eye wash activation																
Adequate water flows actively from both eyelets																
Flow of water is of equal height from each eyelet																
Water is clear after flushing																
The eye wash delivers a steady stream of water																
Do any repairs need to be made																
Initials																

Appendix I - Safety Showers and Eyewashes

Safety Showers and Eye Washes

WVU EHS Laboratory Safety – May 2021

Safety showers and **eye washes** must be installed where the eyes or body of any person may be exposed to injurious, corrosive materials and in labs that work with biohazards at the BSL2 level. Suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.

When using a safety shower or eye wash, flush and/or wash for, at minimum, 15 minutes!

Eye washes can be found in the form of a drench hose, shower and eye wash combination unit, solution/squeeze bottle, and/or a gravity fed box.

Why it's important to maintain eye washes:

- Organisms like Acanthamoeba, Pseudomonas, and Legionella thrive in stagnant water.
- Avoid build up of rust and other solids within the eye wash.
- Eyelet covers that are kept on, until removed by running water, actively protect the eyelets from contamination of chemicals and other unwanted debris.

Requirements

- Eye wash and safety showers must always have a clear path and shall not be used as a storage area.
- Must be accessible within 10 seconds of the hazard.
- Plumbed eye wash and safety shower water must be tepid (60-100˚F).
- Must be flushed for 3 minutes and inspected weekly.
- Must be hands free flushing.

Training

All employees should understand the following safety information:

- Locations of all emergency equipment.
- What the employee should do in the event of an emergency.
- Proper operations of emergency flushing stations.

Practices for Emergency Eye Wash Use

- Immediately go to the nearest eye wash station in the event of a chemical splash or burn.
- Activate the unit – the unit should stay activated hands free!
- While lightly holding your eyes open, gently roll eyes from left to right and up and down to be sure all areas of the eye is being flushed.
- Flush for a full 15 minutes at minimum – any less time does not accomplish dilution of the chemical.
- If wearing lenses, remove them while flushing! Chemicals can be trapped underneath of contacts.
- Seek medical attention after flushing appropriately.

Questions or Need Help?

Contact WVU EHS Laboratory Safety for questions and/or inspections!
(304) 293-4952
EHSLabSafety@mail.wvu.edu

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Appendix J – Portable Fire Extinguishers

Portable Fire Extinguishers

West Virginia University
Environmental Health and Safety

Four Types of Fires

1. Class A – Fires in ordinary combustible materials such as wood, cloth, paper, rubber, and many plastics.
2. Class B – Fires in flammable or combustible liquids, gases, greases, and some rubber and plastic materials.
3. Class C – Fires that involve energized electrical equipment where the electrical non-conductivity of the extinguishing media is important.
4. Class D. Fires in combustible metals such as magnesium, titanium, zirconium, and potassium.

Portable Fire Extinguisher Use and Requirements

- Sound the nearest building fire alarm and evacuate the building when smoke/fire is first discovered.
- Call 911 (9-911 from campus phones) and report the fire, regardless of the size.
- Do not attempt to fight a structure fire; employees are not authorized to fight structure fires.
- Use is limited to those employees that voluntarily agree to use portable fire extinguishers, and have received proper training.
- Never use a portable fire extinguisher on a fire that is beyond its capacity (i.e., a structure fire).
- Use the properly rated portable fire extinguisher for the type of fire. For example, an ABC rated portable fire extinguisher may be used on Class A, Class B, or Class C fires.
- Remember the acronym "PASS" to recall the steps for deploying a portable fire extinguisher:
  - P – Pull the pin.
  - A – Aim the extinguisher nozzle toward the base of the flames.
  - S – Squeeze the trigger while holding the extinguisher canister upright.
  - S – Sweep the extinguisher from side to side, causing the fire area to be covered.
- Use a portable fire extinguisher while you are located between an escape route and the fire.
- Never attempt to use a portable fire extinguisher if the fire has spread beyond its starting point.
- Leave the fire area whenever:
  - The escape route becomes threatened;
  - The portable fire extinguisher becomes depleted; or
  - The fire becomes uncontrollable.

29 CFR 1910.157

Appendix K - Cold Room Guidelines

Cold Room Guidelines

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EHS Lab Safety Guidelines for Cold Rooms

Background

As cold rooms are usually shared among multiple labs, they create unique challenges to ensure a clean and safe environment is maintained. Each lab that utilizes the cold room must take responsibility in maintaining the room. Given the cold and damp environment in cold rooms, mold growth is one of the most common occupational hazards encountered.

Controls

- In order to minimize excess moisture from entering a cold room, it is imperative to keep the cold room door firmly shut. Any spills or standing water should be wiped dry promptly.
- Only those items that are needed should be brought in the cold room.
- Do not store non-essential items in the cold room.
- Shelving and other storage items must be made out of plastic or metal.
- **Cellulose-based (cardboard, paper, wood, etc.) materials are NOT permitted to be stored in the cold room.** This is the primary cause of mold contamination within a cold room.
- **If these guidelines are not followed, mold remediation is the responsibility of the labs utilizing the cold room.**
- Necessary paper products (kimwipes, paper towels, etc.) may be stored in the cold room if they are stored within a closed, air-tight plastic container. Plastic totes or tubs must be utilized in place of cardboard boxes.

Maintenance

- Cold rooms must be routinely disinfected to help maintain a mold-free environment.
- **Monthly surface disinfection within the cold room is recommended as best practice, however at a minimum must be performed quarterly.**
- This should include all inner surfaces of the room, lab bench, chairs, storage/shelving, and inlet and exhaust grills of the cooling blower.
- A fungicidal disinfectant, such as Peroxigard (Rescue) is optimal, as it will not damage metal surfaces. However, any fungicidal disinfectant is acceptable, as long as an appropriate contact time is achieved. A 10% bleach solution is effective to kill visible, vegetative mold, however does not kill mold spores. Following the use of bleach, any metal surfaces must be wiped with water to remove any bleach residue. Bleach residue is corrosive to metal surfaces. Following disinfection, all surfaces should be wiped dry so excess moisture does not remain in the cold room.
- Quarterly assessment of cold room inventory should be performed. During this assessment, all expired items, items which are no longer needed within the room, and any items with visible mold contamination must be removed or discarded.

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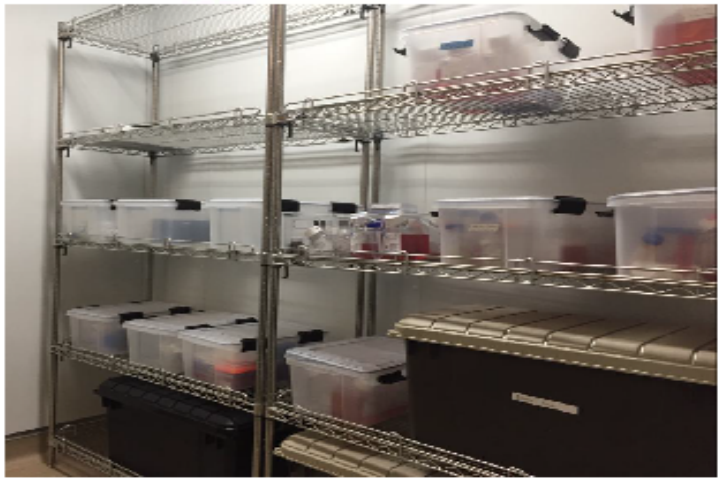
Reminder

Cold rooms are an essential component of many biomedical and clinical research laboratories. They are typically used for temperature-sensitive storage, incubation, and analytical processing. Mold growth can occur in cold rooms but can be prevented by minimizing personnel activity inside the cold room, remove any items/materials that can contribute to mold growth and implement a schedule for regular cleaning. Those are all positive ways to maintain a mold free cold room.

Examples of Good and Bad Cold rooms

No  X

Yes  ✓



For more information about cold rooms access the link below or contact the EHS office at (304)293-0952
https://www.ehs.wvu.edu/biosafety/biosafety-manual/chapter-7-equipment-and-instruments

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Appendix L – Request a Spill Kit

How to fill out a Spill Kit Request

The EH&S Haz waste team will provide you with a spill kit. Simply fill out a waste request but instead of requesting waste pick up just write in spill kit request. Then our hazardous materials team (Bill & Chuck) will bring them to your area. This is the link to request the spill kit. https://www.ehs.wvu.edu/chemical-waste/waste-management/hazardous-waste-disposal. Let me know if you have any questions.

West Virginia University - Environmental Health & Safety Chemical & Hazardous Waste Disposal Form			Fields in RED are Required
College		Department	
Building		Room #	
First Name		Last Name	
Phone #		Email	
C.H.O.		Date	

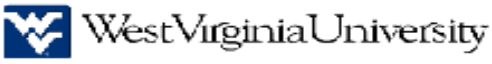
Number of Containers	Size of Container(s)	Chemical(s)

Container Requests:	
Number of Containers	Type of Container(s)
	Spill Kit for Other Chemicals

Comments & Specific Location(s) of Waste(s) inside room
Need a new spill kit

When Completed: Select "File" > "Save As" and Save this form to your computer.
Then Email this file as an attachment to EHS_Chemicals@mail.wvu.edu

Appendix M - Equipment Defrosting Information



Equipment Defrosting Information

(Please Print)

Name:	**Date:**
Job Title:	**P.I. Name/Department:**
Equipment Name and Description:	**Current Location of Equipment:**
Equipment Model Number:	**WVU Inventory Tag Number:**

List below the Room number or location to return the defrosted refrigerator.

Room number or location: _____

_____

_____

_____

Authorized by:_____Date: _____

Appendix N - Equipment Decontamination Certification

Appendix O - Chemical Storage and Proper Labeling

CHEMICAL STORAGE & PROPER LABELING

WVU EHS Laboratory Safety

Proper chemical storage and labeling is key to a safe, tidy, and compliant laboratory. It is mandated by OSHA that all lab chemicals be labeled as part of 29 CFR 1910.1450—Occupational Exposure to Hazardous Chemicals in Laboratories.

Store Like Chemicals with Like Chemicals

- Store flammables in dedicated flammables cabinets
- Separate acids and bases
- Separate organic and inorganic acids
- Nitric Acid must be stored by itself
- Hydrofluoric Acid (HF) must be stored by itself
- Oxidizers must be stored by themselves

Storage Best Practices

- Avoid leaving chemical containers on the floor
- Avoid storing chemicals in fume hoods
- Be sure to store chemicals at or below eye level of the shortest person in the lab
- Always label containers with receiving, opening, and empty dates

Other Storage Requirements

- ALWAYS secure compressed gas cylinders in the upright position
- Keep controlled substances in a locked container or room
- Ensure chemical storage locations are dry—especially where chemicals are incompatible with moisture
- Keep containers closed when not in use
- Store larger chemical bottles towards the back and smaller bottles towards the front with the labels facing out so they can be easily read

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Chemical Labeling

- Every container must be labeled appropriately—this also applies to all beakers, flasks, spray bottles, vials, etc.
- All labels must contain the full chemical name with no abbreviations
- NFPA 704 Diamonds and GHS Pictograms must be used
- Ensure that peroxide forming or high hazardous chemicals have the correct orange label with corresponding dates

~~MeOH~~ → ✓Methanol

~~H_2O~~ → ✓Water

GHS Pictograms

Questions or Need Help?
Contact WVU EHS Laboratory Safety for questions and/or inspections!
(304) 293-4952 or EHSLabSafety@mail.wvu.edu

Appendix P - Chemical and Hazardous Waste Disposal Form

West Virginia University - Environmental Health & Safety
Chemical & Hazardous Waste Disposal Form

Fields in **RED** are Required

College		Department	
Building		Room #	
First Name		Last Name	
Phone #		Email	
C.H.O.		Date	

Number of Containers	Size of Container(s)	Chemical(s)

Container Requests:	
Number of Containers	Type of Container(s)

Comments & Specific Location(s) of Waste(s) inside room

When Completed: Select "File" > "Save As" and Save this form to your computer.
Then Email this file as an attachment to EHS_Chemicals@mail.wvu.edu

v1.4.1 9/8/17 pfp

Appendix Q- Waste Manager Guide

West Virginia University
Environmental Health and Safety

WASTE MANAGEMENT GUIDE

Full SOP available at: https://www.ehs.wvu.edu/chemical-waste/waste-management

IS MY WASTE HAZARDOUS?

You must determine whether your waste has certain characteristics such as Ignitability, Corrosivity, Reactivity, or is Toxic. **Ignitable:** If any contents have a Flash Point below 140 Fahrenheit (5.1 or 5.2 yellow label) OR if the waste tests positive using Potassium-Iodide Starch Paper. **Corrosive:** If total waste solution pH is either ≥12.5 or ≤2. **Reactive:** If waste is water reactive, or produces gasses. **Toxic:** (Decision template under development).

HAZARDOUS WASTE

1. EHS will pick up unwanted chemicals and chemical wastes.
2. Chemicals must be compatible with the container.
3. Containers must be labeled with the words **"Hazardous Waste"** and list the **chemical name(s)**. Use the common or IUPAC name of each chemical (no formulas).
4. Mark all applicable hazard identifiers (i.e., Ignitable, Corrosive, Reactive, Toxic, Oxidizer)
5. Containers must always be kept **tightly** closed unless ***actively*** adding waste.
6. Containers should be no more than 95% full to allow for expansion.
7. Containers must have a screw cap closure or equivalent.
8. Only date container when it is **full**.
9. Submit the Hazardous Waste Disposal Form.
   Form is available at www.ehs.wvu.edu Click on the "Chemical Waste" button.

SPECIAL WASTE

Special wastes are not regulated as hazardous waste. However, these wastes are not suitable for disposal via waste water or with other solid waste trash. Examples of special wastes are; Diesel Fuel, Ethylene and Propylene Glycols, Formalin, Ethidium Bromide Gels and solutions, Sharps with or without needles that were used for chemical transfers only.

LAB CLEAN OUT

A lab clean out is a service that can be utilized to assist you with the removal of old expired, unused, unwanted chemicals from your lab. A lab clean out is also highly recommended when you are preparing to retire, relocate or complete research activities. Lab clean outs can be requested by submitting a Hazardous Waste Disposal Form and typing in the words "LAB CLEAN OUT" in the area you normally list chemicals.

QUESTIONS:

CONTACT YOUR CHEMICAL HYGIENE OFFICER (CHO), OR

Environmental Health and Safety (EHS) Hazardous Materials Unit			Main Office: 304-293-3792
Chuck Joseph	Hazardous Materials Manager	304-293-5787	Charles.joseph@mail.wvu.edu
Bill Graham	Hazardous Materials Associate	304-293-7107	William.Graham@mail.wvu.edu
Alicia Matthews	Hazardous Materials Specialist	304-293-5789	alicia.matthews@mail.wvu.edu

The above instructions apply to Satellite Accumulation of wastes only. If containers are not at the point of initial generation and under control of the operator it is not Satellite Accumulation. You should contact EH&S for a different instruction guide.

Revised 2/24/2023

Appendix R - Biohazard Waste

Should It Go In Biohazard Waste?

Solid waste including, but not limited to:

Closed tubes with less than 15ml of liquid

Paper towel or other materials used to clean infectious materials

Ask yourself:

Did it come in contact with **infectious material** such as living cells, viruses, human tissues and fluids, recombinant nucleic acids, or microorganisms?

YES → Biohazard Waste

NO → Laboratory Trash

Questions?

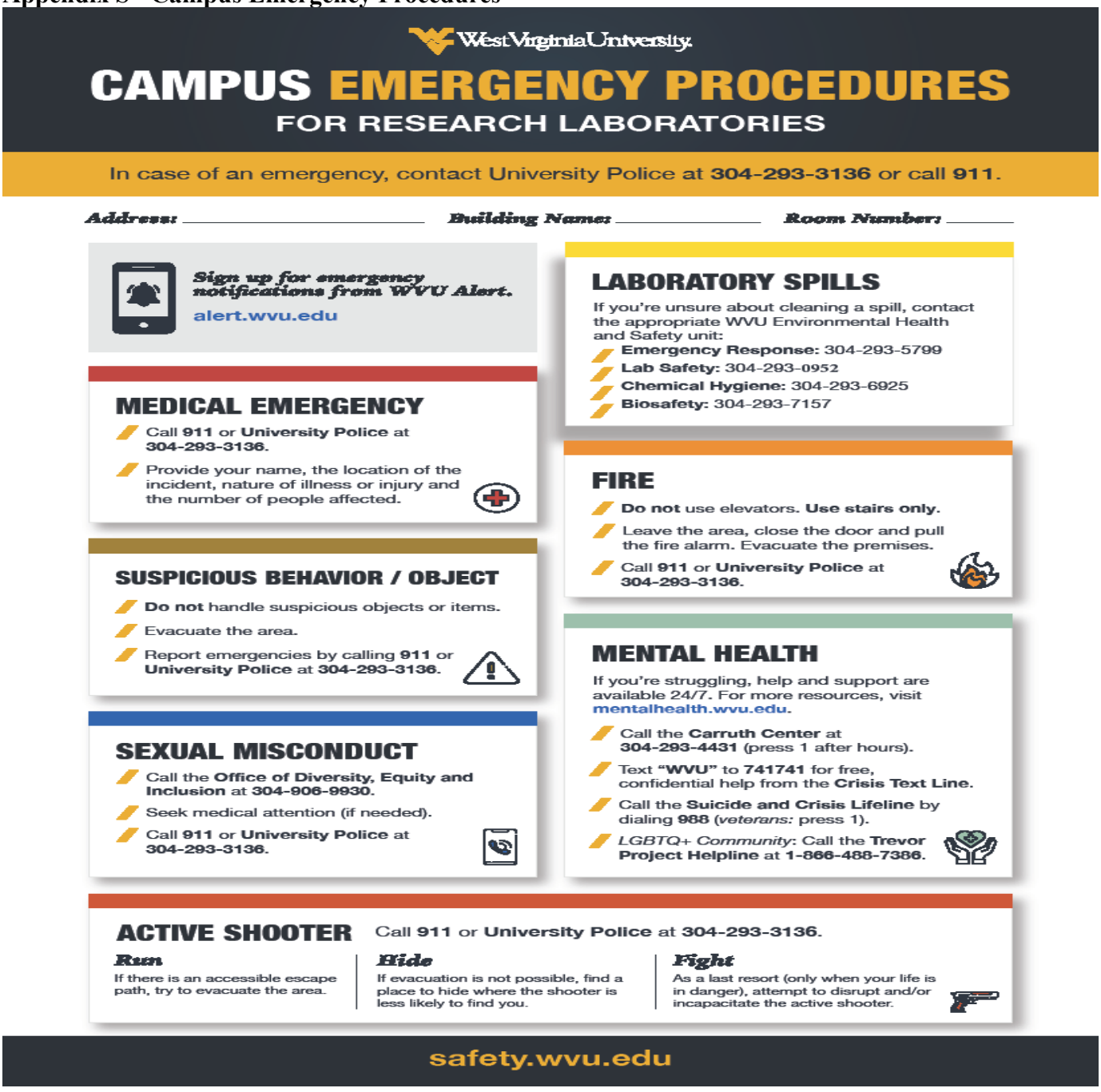
Ali Elliott x37157

Matt Stinoski x11579

biosafety@WVUHSC.onmicrosoft.com

NOTE: All sharps MUST go into sharps waste container

Appendix S - Campus Emergency Procedures



Appendix T - Exposure Response in the Lab

Exposure Response in the lab

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EHS Lab Safety Alert - Exposures to hazards in the laboratory

Date: **January 2025**

Background: Know the steps to take in the event of an accident or exposure to a hazard in the laboratory.

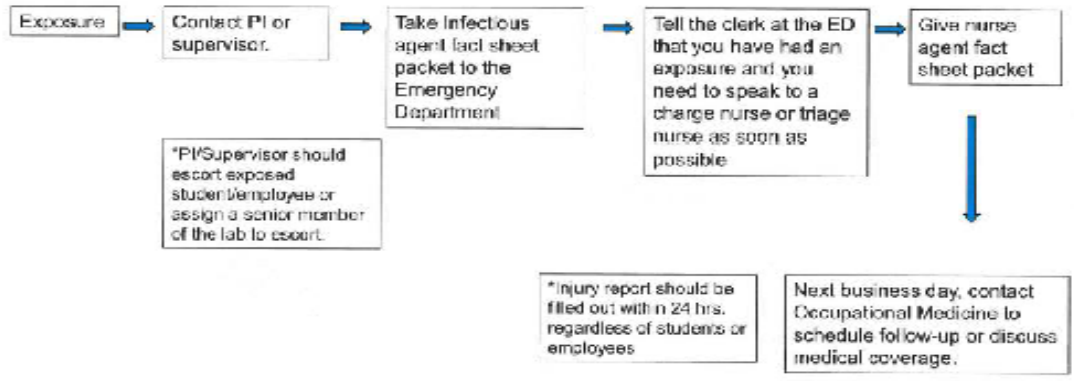
General Tips

- Assign a point of contact for the lab to coordinate emergency response and action.
- Know the location of Infectious Agent Fact Sheets and SDS.
- Refer to the incident response flowchart posted below and in your lab.
- Know the locations of safety showers and eye wash stations.
- Work in a buddy system when working with hazards.
- Ensure all individuals working in the lab have completed laboratory safety and biosafety trainings, keep them current.

Steps

- If exposure occurs, discontinue work. For skin exposure/puncture, wash affected area with soap and water, if eyes are exposed use the eye wash to flush eyes thoroughly.
- Inform PI or point of contact.
- Escort injured/exposed individuals to the emergency room, for biohazard exposures take the **Infectious Agent Fact Sheet**, for chemical exposures, the **SDS**, to speed up treatment.
- Ensure the incident report form (QR link) is filled out within 24 hours and sent to EH&S.
- Individuals need to follow-up with Occupational Medicine following treatment.

EH&S Injury Form



EH&S 304.293.3792 / Occupational Medicine 304.293.3693

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Appendix U - WVU Employee Injury/Incident Report

Appendix V - Student or Visitor Accident Report Form

Appendix W - Dry Ice Reminders

Dry Ice Reminders

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EHS Lab Safety Reminders for Dry Ice

Background

Dry ice is the solid form of carbon dioxide that is available in flakes, pellets or block form and is non-combustible. Dry Ice will sublime (vaporize directly to the gas state) at a temperature of -78.5C (-109.3F) or higher. Hazards associated with the use of dry ice include asphyxiation and burns. Use of dry ice in poorly ventilated areas can result in the depletion of the oxygen level resulting in asphyxiation. Exposed skin should be protected from contact with dry ice to prevent burns.

Controls

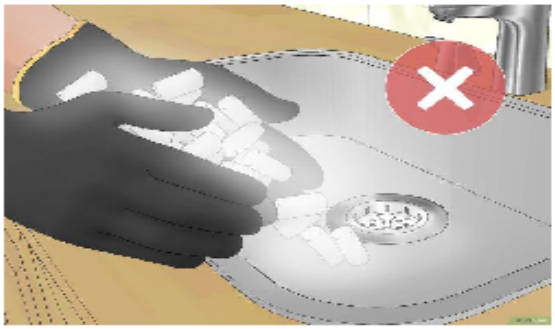
- Dry ice is to be stored in a well-ventilated location and placed in a Styrofoam box, chest, insulated cooler or special cooler designed for the storage of dry ice.
- Because of the thermal expansion of dry ice do not store in a tightly sealed container.
- Do not touch dry ice. Wear appropriate PPE when working with dry ice to prevent burns.
- Do not store/use dry ice in confined areas with limited ventilation. This includes cold rooms, walk-in refrigerators or environmental chambers or rooms without ventilation.
- Do not leave dry ice unattended in open areas.
- Make sure containers are properly labeled.

PPE

- Safety goggles, cryogenic gloves, lab coat or lab apron must be worn when handling dry ice.

Disposal

- Once dry ice is no longer needed, open the container and leave it at room temperature in a well-ventilated area, such as an operating fume hood, so that the remainder will sublime away.
- Never dispose of dry ice in a sink or toilet. The temperature difference can damage the plumbing.
- Never dispose of dry ice in the trash, garbage or chemical waste containers.
- Never leave surplus dry ice in an unsecured area.



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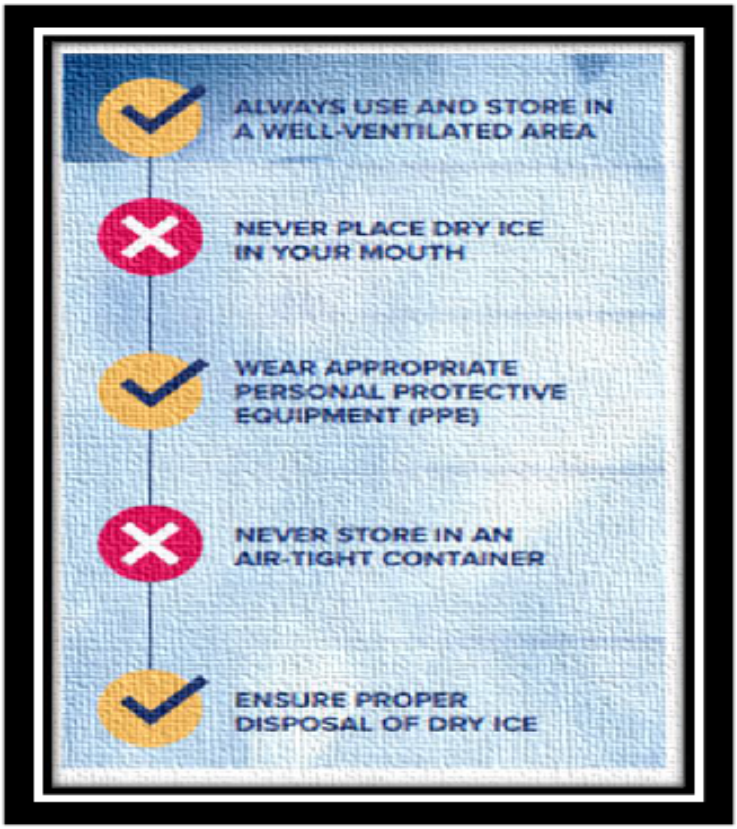
Reminder

Dry ice is extremely cold, putting it in the laboratory sink to melt can cause serious damage to the sink drain and pipes. Disposing of dry ice in the garbage is also prohibited since it is not a well-ventilated area and gas can build up causing a possible explosion hazard. To dispose of dry ice properly, place it in an insulating material such as Styrofoam box and then place it in a well-ventilated area, such as an operating fume hood, so that the remainder will sublime away.

Liquid Nitrogen can also cause the sink and pipes to crack, and if poured down one drain it can come up in another drain, which could create a bad situation for a worker in the lab next door. It should also be placed in a proper container in a well ventilated area in the lab or in a secure outside location to sublime away.

If you have questions or need assistance with disposal of either dry ice or liquid nitrogen, please contact your EHS representative if you have any question.

Working with Dry Ice Tips



Examples of PPE

Example of a proper Dry Ice Storage container

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Appendix X - Laboratory Safety Audits

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Laboratory Inspections

with WVU Laboratory Safety – Environmental Health and Safety

WVU Environmental Health & Safety (EH&S) conducts routine, University-wide laboratory safety inspections. The goal of the inspection is to promote a culture of safety and reduce the risk of injury to researchers and students. We also aim to protect WVU property and ensure compliance with Federal, State, and University rules and regulations. The inspection program also serves to promote a positive working relationship between EH&S and laboratory researchers by working towards the common goal of reducing incidents, injuries, fines, and actions from outside regulatory agencies.

During these inspections, the topics to be reviewed can include:

- Agent Labeling and Waste Management
- Biological Safety
- Documentation and Emergency Signage
- Emergency Response
- Fire and Electrical Safety
- Housekeeping, Facility, and Life Safety
- Laboratory Safety Equipment
- Laser and Radiation Safety
- Personal Protective Equipment

About Your Inspection

Inspections are conducted using cloud-based software by Campus Optics. When an inspection is completed, a report will be emailed through Campus Optics (*West Virginia University <notifications@campusoptics.com>*) to the responsible contact for the space.

Within this email, you will find a link to the inspection report where you will be able to identify and rectify any issues found at the time of the inspection.

Before your inspection, please log in to Campus Optics:
https://wvu.campusoptics.com/users/sign_in

From here, you will sign in to Campus Optics using the University's two-factor authentication system.

Questions About the Inspection

For questions about your Laboratory Safety Inspection, corrective actions, or associated pictures, please contact:
EHSLabSafety@mail.wvu.edu

Scan QR Code for Laboratory Self-Inspection

This **self-inspection** can assist the PI and staff with safety compliance and help EH&S provide additional services where needed.

Appendix Y - Researcher Onboarding Packet

WVU Researcher Onboarding Packet
Last Revision: 06/2024
WVU EHS Laboratory Safety

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ENVIRONMENTAL HEALTH & SAFETY

Table of Contents

West Virginia University's Environmental Health & Safety Mission

Environmental Health and Safety at West Virginia University will promote and advance a culture of commitment to protecting people, property and the environment through innovation, leadership, and customer service.

West Virginia University Environmental Health & Safety Vision

West Virginia University (WVU), Environmental Health and Safety (EHS) will achieve a vital safe and healthy environment for students, staff, and faculty throughout West Virginia. Environmental Health and Safety will be integrated into sustainable partnerships and continuous improvement within facilities, academia, and student organizations of the university. This will be accomplished by providing diligent leadership and expert professional services.

Introduction

This document must be provided to newly appointed faculty and laboratory managers who serve as principal investigators and/or supervise research laboratories.

This document shall serve as a point of reference to assist key laboratory staff in carrying out duties as supervisors over research personnel and spaces.

The following list outlines key responsibilities and expectations of leaders (PIs, Post-docs, lab managers) in the lab:

- A positive and safe work culture in laboratories begins with the supervisory role.
- Supervisory roles observe and meet compliance obligations.
  - Supervisory roles shall also be responsible for contacting EHS about safety equipment that does not meet compliance standards.
- Supervisory roles are responsible for the people and materials in designated laboratory areas. (This may include civil and criminal liability)

EH&S Contacts

We welcome researchers to contact EH&S with any questions you may have. It is helpful to work with an EH&S representative at the beginning of a project to make sure that everything is set up correctly from the beginning. Some of the things we can help with are: safety training, chemical use and disposal, safety equipment testing, biological material use, accidents or exposures, etc.

Laboratory Safety
General – EHSLabSafety@mail.wvu.edu or 304-293-0952
Nicholas Hedrick – nhedrick@mail.wvu.edu or 304-293-4346

Hazardous Materials
Chemical and Hazardous Waste Disposal Requests – EHS_Chemicals@mail.wvu.edu
Hazardous Waste Disposal Form
Waste Determination Request Form
Bill Graham – william.graham@mail.wvu.edu or 304-293-7107
Chuck Joseph – charles.joseph@mail.wvu.edu or 304-293-5787
Alicia Mathews – Alicia.mathews@mail.wvu.edu

Chemical Hygiene
General – ChemicalHygiene@mail.wvu.edu
Crys Povenski – crys.povenski@mail.wvu.edu or 304-293-6925
Janice Robinette – janice.robinette@mail.wvu.edu or 304-293-6012
Dan Gregory – daniel.gregory1@mail.wvu.edu or 304-293-5250
Michael Torries – michael.torries@mail.wvu.edu or 304-293-1355

Controlled Substances
Use of Controlled Substances in Research Policy
Crys Povenski – crys.povenski@mail.wvu.edu or 304-293-6925

RMM
General – RMM@mail.wvu.edu
Paul Porter – paul.porter@mail.wvu.edu
Michael Lokant – mlokant@mail.wvu.edu

Biosafety Office
General Biosafety – biosafety@wvuhsc.onmicrosoft.com
Matt Stinoski – Mstinosk@mail.wvu.edu or 304-581-1759
Josh Parenti - jparenti@mail.wvu.edu or 304-293-0952

Emergency Response
John Hando – John.hando@mail.wvu.edu 304-293-5799

Radiation Safety
304-293-3413

University Police
304-293-3136

For any suspicious activity or behavior, security concerns, or for 24/7 response, call University Police.

WVU EHS Laboratory Safety Services

Laboratory Safety works in conjunction with the rest of WVU EHS to address any and all safety and health concerns and issues across campus. Laboratory Safety is responsible for the following services:

Fume Hood Testing
EHS Laboratory Safety oversees annual fume hood testing to ensure that all fume hoods on all campuses are compliant and in good working order. If at any time leaders suspect that a fume hood is not working properly (i.e., turbulent airflow, low or high face velocity,

unusual noises, no flow, monitor in alarm), EHS must be promptly contacted to assess the hood to bring it back into compliance.

Eyewash Testing
EHS Laboratory Safety oversees annual eyewash testing to ensure that all eyewashes on all campuses are compliant and in good working order. If at any time lab members suspect that an eyewash is not working properly (i.e., low flow in one or both eyelets, extreme hot and cold temperatures), EHS must be promptly contacted to assess the unit to bring it back into compliance.
Laboratories are responsible for inspecting and flushing (3 minutes) their eyewashes weekly. Print and post the Weekly Eyewash Station Maintenance log (in lab safety flyer attachment) near the lab's eyewash.

Safety Shower Testing
EHS Laboratory Safety oversees annual fume hood testing to ensure that all fume hoods on all campuses are compliant and in good working order.

NFPA 704 Updates
EHS Laboratory Safety oversees the NFPA 704 door sign program. The door signs will be updated annually. However, if a leader knows that a chemical inventory has changed, or if the contact information has change, laboratory safety must be promptly notified to update signage.

Laboratory Audits
EHS Laboratory Safety's audit program is completed annually utilizing the SafetyStratus LabCliQ program. All findings will be immediately emailed to the PI's, other lab staff, and Chemical Hygiene Officers (CHOs) with a correction deadline.

Information and Consultation
EHS Laboratory Safety is always available for providing information or consultation to faculty, staff, and students across the University to help make safety the number one priority of research and student's learning experiences.

WVU Laboratory Safety Culture

At WVU, Laboratory Safety supports a culture where the mission of EHS is adopted and practiced throughout all levels of the University.

Laboratory Safety believes that the Principal Investigator (PI) sets the tone for the safety culture within the laboratory. The PI is responsible for and expected to cultivate a safe, compliant atmosphere within their individual labs. PIs are also expected to lead by example to lead their team to a safety minded culture.

Faculty, staff, and students have the following responsibilities:

- Ensuring that all University and departmental or office safety policies and procedures are adhered to as well as complying with safety directives issued by their supervisors

- Ensuring compliance with all health and safety standards and regulations promulgated by regulatory agencies
- Attend and/or complete required safety trainings before or by the date they are required
- Raise safety concerns to immediate supervisors to ensure that the supervisory chain of command is utilized
    - If this method is unsuccessful, contact EHS directly.

Safety Training

Any individual working in a WVU laboratory—paid, unpaid, faculty, staff, student, trainee, or volunteer—shall complete all required safety trainings provided by EHS. PI's must be able to produce training records upon request at any time as a requirement of training compliance. Training will be based on the activities and materials that will be used in the lab and could include hazard communication, hazardous waste, lab safety, biosafety, and others. Please contact lab safety to determine what trainings will be needed for your lab staff and students.

Departmental safety training that is given and tracked by CHOs shall be shared with the EHS laboratory safety staff.

Research and Compliance Management

Research involving human subjects, biohazards, and animals must adhere to federal regulations and will be subject to review by additional oversight committees. Contact the appropriate committee for more information on protocol submission.

Institutional Review Board (IRB) – irb@mail.wvu.edu
Institutional Animal Care and Use Committee (IACUC) – iacuc@mail.wvu.edu
Institutional Biosafety Committee (IBC) – biosafety@wvuhsc.onmicrosoft.com

Injuries/Illness

If any injuries occur while working on WVU property, fill out an injury/illness form located on the EHS website under "report an incident" https://www.ehs.wvu.edu/general-safety/injury-illness Illnesses thought to be the result of an exposure to a biological material, chemical, or zoonotic disease should also be recorded on the injury/illness form. If anyone has an exposure to the above materials, they should go to the Emergency room for evaluation by a physician. The form should be submitted within 24 hours of the injury/illness.

Emergency Procedures

In case of an emergency, call University Police at 304-293-3136 or call 911. When reporting the emergency, be prepared to give a specific location, time, the emergency, and as many details as possible.

Be sure to sign up for emergency notifications from WVU Alert (alert.wvu.edu). This is an emergency notification system.

Medical Emergencies
For medical emergencies, call 911 or University Police at 304-293-3136. Be prepared to provide your name, the location of the incident, nature of the illness or injury, and the number of affected people.

Fire
In the event of a fire, be sure to use stairs only. Leave the area, close the door, and pull the fire alarm. Evacuate the premises. Once evacuated, call 911 or University Police at 304-293-3136.

Active Shooter
Call 911 or University Police at 304-293-3136.

- RUN if there is an accessible escape path, try to evacuate the area.
- HIDE if evacuation is not possible. Find a place to hide where the shooter is less likely to find you. Barricade the door.
- FIGHT as a last resort (only when your life is in danger). Attempt to disrupt and/or incapacitate the active shooter.

Sexual Misconduct
In the event of sexual misconduct, call the Office of Diversity, Equity and Inclusion at 304-906-9930. If needed, seek medical attention.

Call 911 or University Police at 304-293-3136.

Mental Health
If you or someone you know is struggling or needs help, reach out at mentalhealth.wvu.edu or at one of the resources below:

- Call the Carruth Center at 304-293-4431 for 24/7 support (press 1 after hours).
- Text WVU to 741741 for 24/7 free, confidential help from the Crisis Text Line.
- LGBTQ+ Community: call Trevor Project Helpline at 1-866-488-7386.
- For a psychological emergency, call 911 or visit your local emergency room.

Materials Requiring Special Approval

There are some research applications that require processes, equipment, and/or materials to be reviewed and approved prior to work beginning. The PI on these projects must initiate the review process.

Particularly Hazardous Substances (PHS)
PHSs are broadly defined by OSHA Laboratory Standard (29 CFR 1910.1450) as a carcinogen, reproductive toxin, or an acute toxin. A Standard Operating Procedure

(SOP) must be written and approved by EHS before any work that utilizes a PHS can begin.

Department of Homeland Security (DHS) Chemicals of Interest
This includes a list of 300+ compounds that are identified as presenting an increased risk of use in acts of terrorism. The list of DHS chemicals is available from the following link:

https://www.ecfr.gov/current/title-6/chapter-I/part-27/appendix-Appendix%20A%20to%20Part%2027

Please contact John Hando for more information or if there are any questions at 304-293-5799 or john.hando@mail.wvu.edu .

Drug Enforcement Administration (DEA) Controlled Substance
Certain compounds and drugs whose purchase, use, and disposal are strictly controlled require a DEA registration/license. A list of controlled substances is available at the following link:
https://www.deadiversion.usdoj.gov/schedules/orangebook/c_cs_alpha.pdf

Additionally, some chemicals require additional restrictions that do not require a DEA license. A list of restricted chemicals is available at the following link:
https://www.deadiversion.usdoj.gov/schedules/orangebook/f_chemlist_alpha.pdf

Please Contact Controlled Substance Manager, Crys Povenski for additional information at 304-293-6925 or crys.povenski@mail.wvu.edu.

West Virginia University Environmental Health and Safety will aid DEA Registrants (License holders) in maintaining compliance with the applicable laws, policies and procedures through training sessions, consultations, and audits. This includes maintaining copies of registration certificates, renewals, and authorized personnel forms. WVU faculty and staff engaged in research and academic activities involving the use of DEA controlled substances will be responsible for registering with the DEA and WVBOP and maintaining records with EHS.
https://www.ehs.wvu.edu/controlled-substance-use-in-research

Radioactive Material
Use of radioactive materials is authorized and approved by WVU's Radiation Safety Office. Contact the Radiation Safety Office at (304) 293-3413 or radiationsafety@hsc.wvu.edu for guidance and approval.

Biological Materials
Whether in research or teaching activities, certain biological materials must be registered and approved by the Institutional Biological Safety Committee (IBC). The following is a list of biological materials that require approval:

- Recombinant and synthetic nucleic acid molecules as defined by the National Institutes of Health (NIH) Guidelines for Research Involving Recombinant and Synthetic Nucleic Acid Molecules
- Infectious and potentially infectious microorganisms and viruses
- Human and non-human primate materials

- Animal tissues that pose zoonotic disease risks
- Biological toxins

For assistance with biological materials, contact biosafety@wvuhsc.onmicrosoft.com or visit the biosafety manual site: Biosafety Manual | Environmental Health & Safety | West Virginia University (wvu.edu)

Safety Equipment and Engineering Controls

WVU has various pieces of safety equipment and engineering controls across campus. EHS laboratory safety annually tests and keeps a living inventory of this equipment. If there are any suspected issues at any time with the safety equipment or engineering controls, laboratory safety should be contacted immediately for testing to ensure that the equipment is in working order.

The following are examples of safety equipment and engineering controls that can be found at WVU:

Eye Washes
Eye washes are inspected and tested annually by laboratory safety. Lab staff is responsible for flushing eye washes weekly for, at minimum, 3 minutes to ensure proper working order and that the lines are free from debris and sediment. Once lab staff has inspected and flushed the eye wash, it must be recorded on an eye wash station maintenance log (included in attachments). This maintenance log must be displayed in a visible location.

If anything is suspected to be wrong with an eye wash, laboratory safety must be notified immediately for testing and to remedy any issues quickly.

Safety Showers
Safety showers are inspected and tested annually by laboratory safety. If anything is suspected to be wrong with a safety shower, laboratory safety must be notified immediately for testing and to remedy any issues quickly.

Fume Hoods
A fume hood, when installed, maintained, and used properly, can offer a substantial amount of protection to the user. The laboratory safety group annually inspects and tests the average face velocity of fume hoods. If the users, at any time, feel that the fume hood is not working properly, laboratory safety should be immediately contacted for testing and to remedy any issues quickly.

*NOTE: fume hoods shall never be modified, added, or replaced without approval from facilities and EHS.

Biosafety Cabinets
A biosafety cabinet is designed to filter biological aerosols using a HEPA filter. Any procedure involving biohazards which could produce an aerosol should be performed within a biosafety cabinet. Biosafety cabinets must be tested and certified annually. Contact Filtech 412-461-1400 to schedule a certification.

*NOTE: Unless it is hard ducted to the building exhaust (B2 type biosafety cabinet), the biosafety cabinet should not be used for protection against chemical fumes or hazardous gases.

Cleanrooms
Cleanrooms are used in industry when particles can adversely affect a process in various types of manufacturing. WVU has cleanrooms operated by various departments across campus.

Chemical Spill Kits
Chemical spill kits are provided for free by EHS. If a spill kit is needed or needs an item replenished, contact the hazardous materials group. EHS provided kits are sufficient the majority of the time. In unique occasions, specialized kits are needed for chemicals like hydrofluoric acid, elemental mercury, and concentrated acids/bases.

Personal Protective Equipment (PPE)
Labs are responsible for purchasing PPE and providing PPE to anyone working or volunteering within their lab. PPE requirements are based on the hazards used in the lab. For guidance on PPE, contact the Lab Safety group or the Biosafety group.

Laboratory Audits and Regulatory Agency Inspections

While departments are encouraged to conduct their own audits as well as lab staff to conduct self-audits of their own spaces, the laboratory safety group in conjunction with the chemical hygiene group will conduct annual lab audits around campus. Notice will be given to the departmental CHOs when lab audits are scheduled to begin in each building.

During laboratory safety's audits, the SafetyStratus LabCliQ program will be used, and findings will be sent to the CHO, PI, and laboratory safety. It is the responsibility of the PI in conjunction with the CHO to ensure action is taken to correct any deficiencies.

At any time, regulatory agencies can inspect areas. These agencies can be but are not limited to the following: Department of Environmental Protection (DEP), Drug Enforcement Administration (DEA), local fire officials, Occupational Safety and Health Administration (OSHA), and Centers of Disease Control (CDC).

Hazardous Waste Management

The EHS Hazardous Waste Management team (Hazardous Materials Group) coordinates and oversees this program within WVU. The Hazardous waste team services the downtown campus, Evansdale campus, and health sciences campus for weekly, scheduled pick-ups. A disposal request form can also be submitted. This form can be found on the EHS website.

For more information, refer to the WVU EHS Waste Management SOP.

For assistance with biohazard waste, contact the biosafety group.

Shipping Regulated Materials

Contact EHS for information regarding shipping regulated materials—a certified DOT/IATA shipper *is required*. The Hazardous Materials group can be contacted for shipping chemicals. The biosafety team can be contacted for shipping biological materials.

Laboratory Moves and Closeout

When moving within WVU or leaving WVU, PIs and research staff are responsible for properly closing out their spaces, coordinating with EHS, and utilizing the Laboratory Closeout Procedures packet. This packet includes checklists and paperwork to properly document and closeout a lab or prepare and execute an internal move so that nothing is missed.

Please note that the Controlled Substances Manager must be contacted before closeouts or license expirations so that licensures and products will be properly handled.

Additional Resources

Included as separate attachments with this document are handouts for working with hazardous chemicals, biohazards, and chemical ordering information.

Appendix Z - Laboratory Relocation Policies and Procedures

West Virginia University
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HEALTH SCIENCES CENTER

Laboratory Relocation

Policies and Procedures

Vacated laboratories and their associated research equipment and materials, including chemical, biological and radioactive materials that are not properly cleaned and/or decontaminated can pose serious hazards to persons who may enter. These hazards are amplified when materials are not labeled or unidentified, especially for individuals who must dispose of them.

The purpose of this document is to eliminate problems associated with laboratory waste that may create hazards and contribute to compliance issues with regulatory agencies such as the NRC, EPA, DEA, OSHA, NFPA, etc. This guidance addresses the proper disposition of radionuclides, chemicals, equipment, biohazards, laboratory animals and hazardous materials in the event of relocation of a laboratory.

These policies apply to all West Virginia University Health Sciences Center laboratories, darkrooms, storage rooms/buildings, as well as any areas where hazardous, radioactive, biohazardous/infectious materials, animals or controlled substances are stored or used.

Suggested Timeline

Beginning ~ 30 Days Before Relocation please notify:

- Department Chair
- Radiation Safety Office (if applicable)
- HSC Safety Office
- Office of Laboratory Animal Resources (when animals are in use)

- Coordinate with the HSC Safety Office for materials and equipment transfer/disposal
- Meet with Radiation Safety Office to coordinate transfer/disposal of radioactive materials
- Meet with Biosafety Officer to coordinate disposal of biohazardous and infectious materials

- Review all laboratory spaces to ensure all unknown materials have been identified and no new unknowns have been created while preparing to vacate the lab(s)

- Continue follow-up with HSC Safety Office, Radiation Safety, OLAR and Biosafety on the status of critical steps such as:
  - disposal of waste (radioactive, biological, chemical and controlled substances)
  - decontamination of equipment and special equipment moving arrangements
  - signage/posting of your new laboratory for biological or radioactive materials, etc.
  - proper disposition of any human and animal tissues, and tissue samples, as required by applicable regulations.

- **Never transport radioactive materials**

- Do not transport hazardous materials alone. Always transport hazardous materials in secondary containment. Do not transfer expired hazardous materials
- Wear appropriate personal protective equipment for the materials being handled (safety glasses or goggles, lab coat, gloves, closed-toe shoes, etc.)
- Have boxes, plastic bags and containers for broken glass, etc. ready and available
- Post any required warning signs (radioactive materials, biohazards, etc.)

On Moving Day

- Revisit the lab space:
  - Have any hazardous materials been left behind?
  - Are controlled substances taken care of?
  - Has all infectious medical waste, biohazards, sharps containers etc. been picked-up?
  - Is all equipment decontaminated?

- Lock your laboratory and return all keys to the appropriate administrator
- Ensure all other required paperwork has been completed

- ***Package and move lab items only during normal business hours (8:00 Am - 4:30 PM) so staff will be available to provide assistance if there is a spill or incident***

Specific Instructions

Chemicals and Chemical Wastes

- All chemicals must be moved according to the WVU Hazardous Waste Management rules.
- Chemical waste containers must be labeled with the name of the chemical(s). Hazardous waste labels are available from the Safety Office website. Chemical symbols/abbreviations may not be used.
- Containers must be securely sealed and not leaking.
- Hazardous chemical wastes must be clearly labeled and collected for disposal. Submit a ***Chemical & Hazardous Waste Disposal Form*** to request pick-up. This form is found at: http://ehs.wvu.edu/environmental/waste-management/hazardous-waste-disposal-form

Controlled Substances

If controlled substances are to be relocated, the DEA must be notified in writing of their new location.

Compressed Gas Cylinders

- Compressed gas cylinders should be transported from floor to floor on the freight elevator with no additional passengers. Cylinders should always be leak tested before being placed onto the elevator.
- If a passenger elevator cannot be avoided, use service elevator # 5. Do not allow passengers on the elevator. Assure that cylinders are properly secured to a stable cylinder cart before entering the elevator.

Biological Materials

- All small animal tissues are bio-hazardous waste and should be disposed of in a biohazard bag and removed as infectious waste. Large animal tissue disposal is also regulated by the Biosafety Officer, and you should call for instructions on these items.
- All Human Blood and tissue, animal blood and bedding potentially contaminated with a pathogenic microbe, and any wastes from recombinant DNA experiments, are biohazardous waste and should be disposed of in a biohazard bag and removed as infectious waste.
- All non-controlled pharmaceuticals should be disposed of via the Environmental Health and Safety hazardous waste disposal form. Vaccines and enzymes are removed as infectious medical waste.
- All filters and apparatuses that have been used to filter or contain human blood and tissue, recombinant DNA, or pathogenic microbes are bio-hazardous waste and should be disposed of in a biohazard bag and removed as infectious waste.
- All items determined by protocol review from the University Institutional Biosafety Committee or the Safety Office to be biohazardous are to be managed as such.
- All needles, scalpels and any other sharp items that could be defined as "Medical Waste' should be placed in an appropriate sharps container and disposed of as infectious medical waste.
- Biological safety cabinets must be decontaminated prior to being relocated. Please contact the Biological Safety Officer for information.

Radioactive Materials

Radioactive materials are possessed and used by University personnel under the authority of a radioactive materials license. This license restricts possession and use of radioactive materials to qualified personnel (OI/ARU) at discrete locations (authorized places of use), which are approved by the University's Radiation Safety Committee and the Radiation Safety Officer.

If, for any reason, radioactive materials are moved from the authorized place of use, certain steps must be taken to return the previously authorized use area to an unrestricted area, free of radioactive materials or radioactive contamination. Prior to close-out of a radioactive materials area the following steps must be taken.

- Notify Radiation Safety as soon as the intent to relocate is known.
- Make arrangements with the Radiation Safety Department to move all radioactive materials including waste. All radioactive material disposals and/or transfers shall be coordinated through the RSD/RSO.
- Conduct contamination surveys (GM and/or Wipe) prior to removing trash. Remove all trash from the space, including empty containers, papers, and disposable materials. Remove all lab matting, absorbents or chucks from all benches and cabinets, and empty all drawers. If materials are contaminated, dispose of them in radioactive waste, otherwise items can be disposed of in regular trash. If more radioactive waste containers are needed, contact the RSD.
- Radiation fume hoods must be empty of all radioactive equipment and materials. Interior surfaces of the hood must be wiped down with a soap and water solution.
- Conduct contamination survey of the laboratory and decontaminate areas, as necessary. *NOTE*: Areas of potential residual contamination may include refrigerators and freezers, centrifuges, water baths, hoods, sinks, floor areas under waste containers, etc. Prior to defrosting a freezer conduct contamination survey and, if contaminated, coordinate decontamination efforts with the RSD.
- Do not remove any of the signs, stickers, or postings. The RSD will remove them after final inspection. For more information refer to the Radiation Safety Manual for Research Applications and the Radiation Safety website: http://www.hsc.wvu.edu/rsafety/ *For assistance please call the RSD at 304-293-3413.*

Laboratory Equipment and Supplies

- All equipment must be disinfected and decontaminated by lab staff and certified as clean and safe for handling. This includes, but is not limited to chemical hoods, refrigerators, freezers, centrifuges, biological safety cabinets, incubators, ovens, countertops, cabinets, etc.
- Needles, vacutainers, scalpels etc., must be placed into sharps containers for disposal (304-293-4394).
- DO NOT place glass or sharps (syringes, scalpels, etc.) into regular trash.
- Contaminated glassware and lab equipment that cannot be decontaminated must be disposed of as hazardous waste.

Movement of Laboratory Research Chemicals on the HSC Campus

Chemicals may be moved from one laboratory to another laboratory if the following conditions are met:

- Staff who will move the bottles are trained in the proper handling of chemicals and spill response.
- Containers must be in good condition and properly closed/sealed.
- Chemical bottles or containers are properly labeled (full chemical name and associated hazard(s).
- All containers are transported in secondary containment large enough to contain the contents of the material being transported in the event of a spill.
- Crates, boxes, etc. should not be excessively large to prohibit overloading or safe handling.
- Bottles of chemicals are segregated and packed into boxes by hazard class. Non-compatible chemicals may not be packed or moved in the same box (call HSC Safety Office for guidance).
- Glass bottles and all bottles containing liquids will be packed in containers with a buffer of vermiculite or other similar absorbent material.
- Unbreakable bottles of powdered or non-liquid chemicals may be packed with compatible chemicals, without absorbent material.
- Copies of the inventory must be kept in each box, with the moving crew and the originating lab.
- Carts used to move boxes must be sturdy enough to handle the weight of the boxes.
- Adequate spill control material must be available for use by the moving crew. If the containers are being moved between buildings, the spill control material must be available.

- Adequate personal protective equipment (PPE) must be available for the moving crew in the event of a spill. Staff must be trained in the proper method of use of the PPE and spill response.
- An updated chemical inventory for the original lab (showing the removal of the chemicals) and the new lab (showing the receipt of the chemicals) must be completed and kept on file emailed to the Department's Chemical Hygiene Officer (CHO).
- Safety data sheets (SDS) for each hazardous chemical must move with the chemicals.
- Chemicals should be moved only from point A to point B with no stops in between (offices, restroom, etc.) and always be under the control of the responsible person(s); never leave chemicals unattended in corridors or other areas outside the lab.
- Chemicals may not be transported in personal vehicles.

Transporting Biological Materials

General requirements for transport of biological materials within the HSC Campus:

- Personnel transporting biological materials shall be appropriately trained. This includes Bloodborne Pathogen and spill response training for persons transporting human blood, biohazards or infectious material and training specific to any individual pathogen being moved.
- Proper personal protective equipment shall be worn. At a minimum, a lab coat and gloves are required. Goggles shall be worn while packaging and unpacking infectious material.
- Biological materials shall be placed inside an appropriate leak-proof primary container with a tight-fitting lid. These containers should be plastic, glass, or metal. Primary containers shall be placed within a leak-proof, shatter-resistant secondary container.
- Biological materials shall be transported from without any stops in public areas.
- Forceps, a sharps container, and appropriate disinfectants should be available for decontamination and disposal of broken glass or plastic materials.
- All transfer of biological or infectious materials shall be pre-approved by the Biosafety Officer.

Shared Areas

- All chemicals, biological agents, radioactive materials, equipment, etc. used in common/shared areas must be properly disposed of/removed unless other faculty member(s) agree (in writing) to assume responsibility for the materials. These shared spaces include labs, equipment rooms, storage areas, cold rooms, dark rooms, autoclave rooms, shared laboratories, etc.

Research Animals and IACUC Protocols

- The Office of Research Integrity and Compliance must be notified of the PI's new laboratory assignment and all locations where animals will be used.

Contact Information

Department	Phone	Webpage
Radiation Safety Officer Nasser Razmianfar	304-293-3413	http://www.hsc.wvu.edu/rsafety/ nrazmianfar@hsc.wvu.edu
HSC Safety Office	304-293-0952	http://www.hsc.wvu.edu/safety/
BioSafety Officer Ali Elliott	304-293-7157	http://ehs.wvu.edu/biosafety aaelliott@mail.wvu.edu
EH&S Hazardous (Waste/Controlled Substance Disposal)	304-293-3795	http://ehs.wvu.edu/
HSC Facilities Management (Equipment removal and Infectious Medical Waste Pick-up)	304-293-4394	http://www.hsc.wvu.edu/facilities/work-request/

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Laboratory Relocation Checklist

Building: _____ Rooms: _____

Department: _____

Responsible Researcher(s): _____

Email: _____ Office Phone: _____ Cell Phone: _____

Staff/Faculty Completing Relocation Forms	Signature

Lab is relocating: Yes No If so, to: Building: _____ Rooms: _____

I. Chemicals	**Date Completed / Initials**
Chemical hoods have been cleared of all chemicals and equipment; Hoods/benches are cleaned and decontaminated	
Refrigerators, freezers, hoods and bench tops, storage cabinets cleaned and checked to ensure all chemical containers have been removed	
All waste containers of chemicals are labeled with the name of the chemical(s) and have been scheduled for disposal	
All containers securely sealed and not leaking	
Chemical Waste Pick Up Request submitted	
Applicable equipment and apparatuses decontaminated and any equipment oil properly drained	
All containers (beakers, flasks, etc.) emptied, contents properly disposed of, and cleaned	
II. Controlled Substances	**Date Completed / Initials**
DEA notified in writing of new storage and usage locations. (All appropriate forms and inventories have been completed)	
Controlled substance(s) disposed of: the date, manner of disposal, and quantity of substance/s disposed of have been recorded. Keep all disposal records	
III. Compressed Gas	**Date Completed / Initials**
Gas disconnected, caps replaced, and cylinders secured for move	
Lecture bottles and Map Gas cylinders disposed of via ***EH&S Waste Disposal Form***	
IV. Biological Materials *Contact Biosafety Officer for assistance.*	**Date Completed / Initials**
Animal tissues are disposed of in a biohazard bag and removed as infectious waste.	
Free liquids removed; solids properly packaged for animal tissues fixed in Ward Safe, Caro Safe, any other non-hazardous fixative, and/or formaldehyde solution	

Fixative liquids declared as Non-RCRA Regulated Waste have been disposed of via ***EH&S Waste Disposal Form***	
All Human blood and tissue, animal blood, bedding potentially contaminated with a pathogenic microbe, and any wastes from recombinant DNA experiments disposed of in a biohazard bag and removed as infectious medical waste	
All non-controlled pharmaceuticals disposed of via ***EH&S Waste Disposal Form***	
Filters/apparatuses used to filter or contain Human blood and tissue, recombinant DNA or pathogenic microbes disposed of in a biohazard bag and removed as infectious medical waste	
All needles, scalpels and any other sharp items placed in an appropriate sharps container and removed as infectious waste	
V. Radioactive Materials	**Date Completed / Initials**
Notify WVU RSO as soon as the intent to relocate is known.	
Prior to removing trash and any other items and defrosting freezers, conduct GM survey and/or wipe tests on all materials/surfaces to check for radiation contamination. Contaminated materials shall be disposed separately from non-contaminated materials.	
Remove all trash, including empty containers, papers, and disposable materials. Remove lab matting, absorbents or chucks from benches and cabinets, and empty all drawers. If needed, contact RSD for a radioactive disposal pail or drum for contaminated materials.	
Radiation fume hoods must be empty of all radioactive equipment and materials. Interior surfaces of the hood shall be wiped down with a soap and water solution.	
Uncontaminated broken or unwanted glassware shall be disposed of in a glass waste box with a clear plastic liner. Dispose of sharps (needles, razor blades) in approved sharps-container.	
Contact the RSD for assistance in moving radioactive materials to the new the lab.	
Perform a radiation survey of the entire lab, including equipment that may have contained radioactive material (GM survey and wipe test survey) to ensure all radioactive sources have been removed and area is free of contamination. If contamination is found, decontaminate and resurvey until below background limits.	
All radioactive material waste containers removed/picked up by the RSD.	
VI. Equipment and Supplies	**Date Completed / Initials**
All equipment disinfected and decontaminated and certified as clean and safe for handling. Contact HSC Safety Office for paperwork and signage. *(*Must receive a signed "decontaminated" sticker from Biosafety Officer in order for equipment to be sent to surplus or the trash)*	
Biological safety cabinets decontaminated *	
Contaminated glassware and lab equipment that cannot be decontaminated disposed of as hazardous waste	
Chemicals, biological agents, radioactive materials, equipment, etc. used in common/shared areas properly disposed of or appropriately packed for relocation.	

Department Chair (signature): _____ Date: _____

Faculty/Researcher (signature): _____ Date: _____

Comments: _____

Retain a copy of this form. Provide a copy to your Chair, HSC Safety Office, HSC Senior Associate Vice President for Research & Graduate Education, and the Associate Dean for Research in your School.

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HEALTH SCIENCES CENTER

SAFETY OFFICE RELOCATION VERIFICATION

To be completed by WVU HSC Safety Office Representative, PI and Department Chair

Chemical Safety	Yes	No	N/A
Chemical hoods have been cleared of all chemicals and equipment?			
Chemical hoods have been cleaned/decontaminated?			
Was perchloric acid used in any hood/exhaust device in this lab?			
All signs (hazard, caution, etc.) removed where appropriate?			
All chemicals and controlled substances have been moved or disposed of according to WVU policy?			
Gas cylinders have been moved according to WVU policy?			
Shelves and cabinets have been cleared and cleaned/decontaminated?			
Countertops have been cleaned/decontaminated?			
Equipment has been properly cleaned/decontaminated?			
Refrigerators and freezers have been cleaned/decontaminated?			
Emergency contact and hazard information (704 Posting) has been changed on lab door(s)?			

WVU HSC Safety Office Representative: _____ **Date:** _____

Biological Safety	Yes	No	N/A
Inside of the Biological Safety Cabinet has been properly decontaminated?			
Incubators, water baths and any other potentially contaminated equipment have been properly decontaminated and stickered/signed off by the Biosafety Officer?			
Biohazard areas have all been properly decontaminated?			
All biological waste and sharps containers have been removed/properly disposed of?			
All biological materials have been properly relocated or disposed of? If relocated, specify new location:			
All biohazard stickers have been removed?			

WVU Biological Safety Office Representative: _____ **Date:** _____

Radioactive Materials Verification	Yes	No	N/A
All radioactive isotopes have been properly moved, as directed by the University Radiation Safety Officer (RSO)?			
All radioactive waste has been removed, as directed by the RSO?			
All equipment, glassware, lab benches, fume hoods, etc. have been emptied, cleaned, and wiped down and if necessary, decontaminated?			
Radiation Safety Department survey conducted and area/lab is <0.02 mR/hr (a.k.a. background)?			
Lab has been cleared of all Radiation Safety issues by RSO, and the RSD has removed all radiation hazard/warning signs)?			

WVU Radiation Safety Officer: _____ **Date:** _____

Institutional Animal Care and Use Committee & Office of Laboratory Animal Resources	Yes	No	N/A
All protocols and animals have been properly transferred or removed, as approved by OLAR and the IACUC?			

OLAR Representative: _____ **Date:** _____
IACUC Representative: _____ **Date:** _____

Required Signatures:

Faculty/Researcher (signature): _____ Date: _____

Department Chair (signature): _____ Date: _____

Trainee 1 (signature): _____ Date: _____
Trainee 2 (signature): _____ Date: _____
Trainee 3 (signature): _____ Date: _____

Comments:

_____

_____

Retain a copy of this form in your departmental files. Provide a copy to your department Chair, WVU HSC Safety Office, the Senior Associate Vice President for Research & Graduate Education and the Associate Dean for Research in your School.

Appendix AA– Laboratory Close-Out Reminders

This document is a reminder to assist Department Administrators to ensure that all relevant research laboratory activities are properly closed out.

Environmental Health and Safety (EHS) will provide proper guidance and recommendations throughout the laboratory clearance process.

- ☐ Chemicals are properly identified, RMM group contacted and waste request submitted. Chemicals must be disposed of correctly.
- ☐ Controlled substances transferred correctly and DEA notified as necessary
- ☐ Infectious medical waste, biohazards, sharps containers etc. have been picked-up
- ☐ Equipment has been decontaminated and labeled by EHS
- ☐ Gas cylinders have been removed from the area and vendor contacted about billing
- ☐ Remaining equipment has been properly cleaned and decontaminated
- ☐ Refrigerators and freezers have been cleaned, decontaminated and labeled
- ☐ Emergency contact and hazard information (704 Posting) has been updated
- ☐ Clean and decontaminate benchtops, furniture, other surfaces, laboratory hoods, storage cabinets, and other fixed equipment
- ☐ Inspect all lab spaces to verify the removal of all chemicals. Be sure to check all drawers, cabinets, cupboards, refrigerators, etc
- ☐ Ensure all other required paperwork has been completed
- ☐ The department is responsible for conducting a final walk through to ensure all draws, cabinets and benchtops are clean and empty

Appendix BB– Laboratory Close-Out Policies and Procedures

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Laboratory Close-Out

Policies and Procedures

This document is offered to assist HSC Principal Investigators, Department Administrators and Center Leadership in ensuring that all relevant research laboratory activities are properly closed-out. The policies apply to PIs who are terminating their employment with the HSC or relocating to another laboratory, and those whose laboratories are being vacated for renovations. Procedures are outlined for safe disposal of chemical, biological and/or radiological materials and cleaning and decontamination of equipment and select laboratory areas. Adherence to these policies will ensure safe and compliant transitions of laboratory occupancy. Failure to comply with these provisions may block or delay the transfer of research grants and/or equipment and can result in legal pursuit of payment for monies spent to close-out a laboratory.

Table of Contents

Purpose and Scope

Vacated laboratories and their associated research equipment and materials, including chemical, biological and radioactive materials that are not properly cleaned and/or decontaminated can pose serious hazards to persons who may enter. These hazards are amplified when materials are not labeled or unidentified, especially for individuals who must dispose of them.

The purpose of this document is to eliminate problems associated with laboratory waste that may create hazards and contribute to compliance issues with regulatory agencies such as the NRC, EPA, DEA, OSHA, NFPA, etc. This guidance, that addresses the proper disposition of radionuclides, chemicals, equipment, biohazards, laboratory animals and hazardous materials, should be adhered to:

- upon the departure, change in employment status or termination of active research of the responsible individual(s); and
- upon any change in use or relocation from the assigned laboratory

These policies apply to all West Virginia University Health Sciences Center laboratories, darkrooms, storage rooms/buildings, and any areas where hazardous, radioactive, biohazardous/infectious materials, animals or controlled substances are stored or used.

The Laboratory Close-Out Checklist and Verification Forms must be completed and signed by appropriate personnel.

Timeline

60-90 days Before Departure

- Two-three months before moving please send a notification letter to the:
  - Department Chair
  - Dean
  - Radiation Safety Office
  - HSC Safety Office
  - Office of Laboratory Animal Resources (when animals are in use)
  - Grants Manager

- Begin laboratory close-out
- Meet with HSC Safety Office for coordination of materials and equipment transfer/disposal
- Meet with Radiation Safety Office for coordination of radioactive materials transfer/disposal
- Meet with Biosafety Officer to coordinate disposal of biohazardous and infectious materials
- Meet with Office of Laboratory Animal Research (OLAR) for animal care, use or transfer
- Meet with your Dean or his/her designee to coordinate transfer and supervision of students or staff

30 days Before Departure

- Review all laboratory spaces to ensure all unknown materials have been identified and no new unknowns have been created while preparing to vacate the lab(s)

- Keep HSC Safety Office, Radiation Safety, OLAR and Biosafety informed of the safe transfer and removal of any hazardous materials, controlled substances, biohazards, etc. Seek guidance as necessary

- Make arrangements for compressed gas cylinders to be returned to vendor

- Continue follow-up on the status of time critical close-out steps such as:
  - disposal of radioactive, biological, chemical and controlled substance waste
  - decontamination of equipment
  - special equipment moving arrangements
  - posting of your new laboratory for biological or radioactive materials, etc.
  - communication with faculty who will support/supervise remaining students/staff
  - proper disposition of animals, animal carcasses, and/or tissue samples, as required by applicable regulations. Animals cannot be abandoned in the lab or vivarium. Contact OLAR for assistance.
  - disposal of Human organs and/or recognizable specimens, typically through the morgue. Please contact the HSC Safety office for specific guidelines
  - forward internal training documentation to the Department Chairperson
- ***Package and move lab items only during normal business hours (8:00 Am - 4:30 PM) so staff will be available to provide assistance if there is a spill or incident***

30 days Before Departure, continued

- **Never transport radioactive materials**
- Never transport hazardous materials alone. Always transport hazardous materials in secondary containment
- Never transport hazardous materials on public roads. Hazardous materials must be transported or shipped by professionals and in accordance with DOT and IATA regulations
- Do not transfer expired hazardous materials
- Wear appropriate personal protective equipment for the materials being handled (safety glasses or goggles, lab coat, gloves, closed-toe shoes, etc.)
- Have boxes, plastic bags and containers for broken glass, etc. ready and available
- Post any required warning signs (radioactive materials, biohazards, etc.)

Move Out Day

- ***Only move lab items during normal business hours (8:00 AM-4:30 PM) so staff will be available to assist in the event of a spill or incident***
- **Never transport radioactive materials**
- Revisit the lab space:
  - Have any hazardous materials been left behind?
  - Are controlled substances taken care of?
  - Has all infectious medical waste, biohazards, sharps containers etc. been picked-up?
  - Is all equipment decontaminated?

- Complete the *Separation of Employment Form* and turn it in to your Department Administrator. At this time also lock your laboratory and return ID, keys, parking pass, etc.
- Ensure all other required paperwork has been completed

Specific Close-Out Instructions

Chemicals

- All chemicals must be disposed of according to the WVU Hazardous Waste Management rules.
- Check refrigerators, freezers, chemical hoods and bench tops as well as storage cabinets for chemical containers.
- Assure that all chemical waste containers of are labeled with the name of the chemical(s). Hazardous waste labels are available through the Safety Office and can be found on their website. Abbreviations or chemical symbols are not acceptable for labeling.
- All containers must be securely sealed and not leaking.
- All containers (beakers, flasks, etc.) must be emptied (contents must be properly disposed of), and cleaned.
- Hazardous chemical wastes must be clearly labeled and collected for disposal. Submit a ***Chemical & Hazardous Waste Disposal Form*** to request pick-up. This form is found at:

  http://ehs.wvu.edu/environmental/waste-management/hazardous-waste-disposal-form

Controlled Substances

- Transferring ownership of a controlled substance to another licensed individual must be recorded in writing. If controlled substances are relocated, the DEA must be notified in writing of their new location.
- If a controlled substance(s) is distributed to another person, their name, address and DEA registration number must be recorded in the substance(s) continuing record, along with the date and number of units distributed. Records must be maintained.

- **Responsibility for disposal for controlled substances belongs to the registrant**
  - Complete ***WVU Substance Transfer for Disposal Form***, available on the EHS website:

    http://ehs.wvu.edu/r/download/208982

  - E-mail the completed form to EHS_Chemicals@mail.wvu.edu (Subject line: DEA Controlled Substances)

- **Orphaned Substances**
  - Secure the substance
  - Complete the top part of the regular ***Chemical & Hazardous Waste Disposal Form*** (Substances do not have to be listed on this form, instead just enter: *"See DEA Form 41".*)
  - Complete DEA Form 41 (Form available on DEA website at: http://www.deadiversion.usdoj.gov/21cfr_reports/surrend/41_form.pdf)

    (Complete Sections A and B only. Section C is not applicable. Please use your name as the Contact in Section A)
  - Submit both forms to EHS_Chemicals@mail.wvu.edu (Subject line: Orphaned Substance)
  - Keep all disposal records.

Compressed Gas Cylinders

- Remove gas connections, replace cylinder caps, and contact the vendor for pick-up. Cylinders must remain secured until pick-up by vendor. Any compressed gas cylinder being moved must be secured on an appropriate cylinder cart.
- Small lecture bottles and Map gases will be disposed of via WVU Environmental Health and Safety. Submit a ***Chemical & Hazardous Waste Disposal Form*** to request pick-up.
- Compressed gas cylinders should be transported from floor to floor on the freight elevator with no additional passengers. Cylinders should always be leak tested before being placed onto the elevator.
- If a passenger elevator cannot be avoided, use service elevator # 5. Do not allow passengers on the elevator. Assure that cylinders are properly secured to a stable cylinder cart before entering the elevator.

Biological Materials

- All biological materials must be transferred to an investigator listed on you IBC protocol, or with their own IBC protocol, for safekeeping or disposal. Seek guidance from the Biosafety Officer.
- All small animal tissues are bio-hazardous waste and should be disposed of in a biohazard bag and removed as infectious waste. Large animal tissue disposal is also regulated by the Biosafety Officer, and you should call for instructions on these items.
- All animal tissues fixed in Ward Safe, Caro Safe and any other non-hazardous fixative should be considered bio-hazardous waste. All free liquids should be removed and the solids properly packaged in proper shipping containers or discarded as infectious medical waste. This also includes animal tissues fixed in formaldehyde.
- All Human Blood and tissue, animal blood and bedding potentially contaminated with a pathogenic microbe, and any wastes from recombinant DNA experiments, are biohazardous waste and should be disposed of in a biohazard bag and removed as infectious waste.
- All non-controlled pharmaceuticals should be disposed of via the Environmental Health and Safety hazardous waste disposal form. Vaccines and enzymes are removed as infectious medical waste.
- All filters and apparatuses that have been used to filter or contain human blood and tissue, recombinant DNA, or pathogenic microbes are bio-hazardous waste and should be disposed of in a biohazard bag and removed as infectious waste.
- All items determined by protocol review from the University Institutional Biosafety Committee or the Safety Office to be biohazardous are to be managed as such.
- All needles, scalpels and any other sharp items that could be defined as "Medical Waste' should be placed in an appropriate sharps container and disposed of as infectious medical waste.
- Biological safety cabinets must be decontaminated prior to being relocated. Please contact the Biological Safety Officer for information.

Radioactive Materials

Radioactive materials are possessed and used by University personnel under the authority of a radioactive materials license. This license restricts possession and use of radioactive materials to qualified personnel (OI/ARU) at discrete locations (authorized places of use), which are approved by the University's Radiation Safety Committee and the Radiation Safety Officer.

If, for any reason, radioactive materials are removed from the authorized place of use, or if the PI/ARU should separate from the University, certain steps must be taken to return the previously authorized use area to an unrestricted area, free of radioactive materials or radioactive contamination. Prior to close-out of a radioactive materials area the following steps must be taken.

- Notify Radiation Safety as soon as the intent to vacate is known, preferably 90 days in advance.
- Make arrangements with the Radiation Safety Department to remove all radioactive materials including waste from the laboratory. All radioactive material disposals and/or transfers shall be coordinated through the RSD/RSO.
- Conduct contamination surveys (GM and/or Wipe) prior to removing trash. Remove all trash from the space, including empty containers, papers, and disposable materials. Remove all lab matting, absorbents or chucks from all benches and cabinets, and empty all drawers. If materials are contaminated, dispose of them in radioactive waste, otherwise items can be disposed of in regular trash. If more radioactive waste containers are needed, contact the RSD.
- Radiation fume hoods must be empty of all radioactive equipment and materials. Interior surfaces of the hood must be wiped down with a soap and water solution.
- Conduct contamination survey of the laboratory and decontaminate areas, as necessary.
  NOTE: Areas of potential residual contamination may include refrigerators and freezers, centrifuges, water baths, hoods, sinks, floor areas under waste containers, etc. Prior to defrosting a freezer conduct contamination survey and, if contaminated, coordinate decontamination efforts with the RSD.
- Do not remove any of the signs, stickers, or postings. The RSD will remove them after final inspection.
- If the laboratory is being vacated because the researcher is leaving the University, the following additional steps must be taken:
  1. Usage records, including Survey Records, must be updated, finalized and submitted to the RSD.
  2. Waste disposal records must also be finalized and turned in.
  3. All radioactive material waste containers must be removed/picked up by the RSD.
  4. Personnel dosimeters must be returned to the RSD.
  5. Termination bioassays must be performed, if applicable.

For more information refer to the Radiation Safety Manual for Research Applications and the Radiation Safety website: http://www.hsc.wvu.edu/rsafety/

For questions or assistance please call the RSD at 304-293-3413.

Radioactive materials, contaminated equipment, or equipment that is capable of producing ionizing radiation may be transferred to another facility which is licensed to possess such materials, by the U.S Nuclear Regulatory Commission or by another agreement state. The transfer of licensed materials shall be under the direction of the RSO. Prior to shipment/transfer of the material, the RSO must have a current copy of the radioactive materials license that authorizes the Institution, facility, or individual who will be in receipt of any licensed material prior to shipment from the university.

Laboratory Equipment

- All equipment must be disinfected and decontaminated by lab staff and certified as clean and safe for handling. This includes, but is not limited to, all chemical hoods, refrigerators, freezers, centrifuges, biological safety cabinets, incubators, ovens, countertops, cabinets, etc.

- Equipment that will not become the responsibility of another faculty member or the department must be taken to surplus or properly disposed as necessary. Contact the WVU HSC Safety Office if you are not certain of the appropriate action.
- Spent fluorescent lights should be disposed of via Facilities Management at 304-293-4394.
- Seek guidance from HSC Safety Office regarding battery disposal.
- Seek guidance from Information Technology Services regarding computer disposal at 304-293-3631.

Laboratory Supplies

- Glassware, if non-contaminated, should be collected in sturdy, puncture-resistant containers; all glassware must be empty and all labels must be removed or obliterated; containers must not be overfilled - no glass should ever be protruding from the container. Dispose when glassware is within a few inches of the top or when the weight of the container reaches a safe maximum weight for lifting based on the person(s) who will be carrying it to the dumpster. DO NOT place glassware in laboratory receptacles used for collection of general waste (i.e. paper, plastic).
- Broken glass should be placed in a cardboard box labeled "Broken Glass" and sealed shut with tape.
- If glassware/container has held acutely toxic chemicals, it must be triple-rinsed and the rinsate disposed as hazardous waste; container may then be disposed with general glassware.
- Containers with "biohazard" or biohazard symbols may not be used for disposal of general glassware.
- Keep the bottom of the box dry (check before lifting to ensure that the container will remain intact when lifted).
- Seal/tape the box securely and place it by the regular trash for the housekeeping staff, with a note that the broken glass is ready for disposal.
- All needles, vacutainers, scalpels etc., must be placed into sharps containers for disposal, contact 304-293-4394.
- DO NOT place glass or sharps (syringes, scalpels, etc.) into regular trash.
- Usable, non-contaminated laboratory supplies may be transferred to other researchers.
- Contaminated glassware and lab equipment that cannot be decontaminated must be disposed as hazardous waste.

Movement of Laboratory Research Chemicals on the HSC Campus

Faculty/staff may move chemicals from one laboratory to another laboratory if the following conditions are met:

- Staff who will move the bottles are trained in the proper handling of chemicals and spill response.
- Containers must be in good condition and properly closed/sealed.
- Chemical bottles or containers are properly labeled (full chemical name and associated hazard(s).
- All containers are transported in secondary containment large enough to contain the contents of the material being transported in the event of a spill.
- Crates, boxes, etc. should not be excessively large to prohibit overloading or safe handling.
- Bottles of chemicals are segregated and packed into boxes by hazard class. Non-compatible chemicals may not be packed or moved in the same box (call HSC Safety Office for guidance).
- Glass bottles and all bottles containing liquids will be packed in containers with a buffer of vermiculite or other similar absorbent material.
- Plastic or unbreakable bottles of powdered or non-liquid chemicals may be packed with compatible chemicals, without absorbent material.

- Each box of chemicals must be inventoried for contents as it is being packed. Required information will include chemical name, number of bottles and quantity in each.
- Boxes must be labeled distinctly with a corresponding inventory page.
- Copies of the inventory must be kept in each box, with the moving crew and the originating lab.
- Carts used to move boxes must be sturdy enough to handle the weight of the boxes and the terrain they will be moved over.
- Adequate spill control material must be available for use by the moving crew. If the containers are being moved between buildings, the spill control material must be available.
- Adequate personal protective equipment (PPE) must be available for the moving crew in the event of a spill. Staff must be trained in the proper method of use of the PPE and spill response.
- An updated chemical inventory for the originating lab (showing the removal of the chemicals) and the receiving lab (showing the receipt of the chemicals) must be completed and kept on file in each of the respective labs and emailed to the Department's Chemical Hygiene Officer (CHO).
- Safety data sheets (SDS) for each hazardous chemical must be attached to inventories.
- Chemicals should be moved only from point A to point B—no stops in between (offices, restroom, etc.)
- Chemicals must always be under the control of the responsible person(s); never leave chemicals unattended in corridors or other areas outside the lab.

Transporting Biological Materials

General requirements for transport of biological materials within the HSC Campus:

- Personnel transporting biological materials shall be appropriately trained. This includes Bloodborne Pathogen and spill response training for persons transporting human blood, biohazards or infectious material and training specific to any individual pathogen being moved.
- Proper personal protective equipment shall be worn. At a minimum, a lab coat and gloves are required. Goggles shall be worn while packaging and unpacking infectious material.
- Biological materials shall be placed inside an appropriate leak-proof primary container with a tight-fitting lid. These containers should be plastic, glass, or metal.
- Primary containers shall be placed within a leak-proof, shatter-resistant secondary container.
- The surface of the secondary container must be easily cleanable and labeled with the biohazard label. Rubbermaid or similar brand coolers or plastic boxes with tight-fitting lids may be used. All packages containing infectious substances must be labeled with the contents and a name and phone number of the responsible party.
- Primary containers are placed upright in the secondary container; tube racks or other means are used.
- Biological materials shall be transported from laboratory to laboratory without any stops in public areas such as offices, cafeterias, or restrooms.
- The receiver of transported biological materials shall be prepared to receive the materials. At a minimum, wear a lab coat, gloves, and safety goggles. The receiver shall have a plan to deal with damaged or broken primary containers with a spill kit in the laboratory.
- Forceps, a sharps container, and an appropriate disinfectant shall be available for decontamination and disposal of broken glass or plastic materials.
- All transfer of biological or infectious materials shall be pre-approved by the Biosafety Officer.

Shipping Hazardous or Infectious Materials off Campus

- Specific regulations (e.g. DOT, IATA, OSHA) must be observed when shipping or transporting hazardous materials outside of HSC campus.
- Contact HSC Safety and Biosafety Officer for approval and guidance

Shared Areas

- All chemicals, biological agents, radioactive materials, equipment, etc. used in common/shared areas must be properly disposed of/removed unless other faculty member(s) agree (in writing) to assume responsibility for the materials.
- These shared spaces include labs, equipment rooms, storage areas, cold rooms, dark rooms, autoclave rooms, shared laboratories, etc.
- Chemicals may not be transported in personal vehicles.
- All required paperwork and documentation of transfer must be completed.

Research Animals and IACUC Protocols

- The Office of Research Integrity and Compliance must be notified of a PI's forthcoming departure sufficiently in advance to transfer or terminate IACUC protocols and/or amend approved personnel.
- Research animals in the vivarium need to be transferred to an approved protocol or euthanized.
- Consult with the Office of Laboratory Animal Resources (OLAR) to make arrangements.

Contact Information

Department	Phone	Webpage
Radiation Safety Officer Stephen Root	304-293-5556	http://www.hsc.wvu.edu/rsafety/ sroot@hsc.wvu.edu
HSC Safety Office	304-293-0952	http://www.hsc.wvu.edu/safety/
BioSafety Officer Matthew Stinoski	304-581-1759	http://ehs.wvu.edu/biosafety mstinosk@mail.wvu.edu
EH&S Hazardous (Waste/Controlled Substance Disposal)	304-293-3795	http://ehs.wvu.edu/
HSC Facilities Management (Equipment removal and Infectious Medical Waste Pick-up)	304-293-4394	http://www.hsc.wvu.edu/facilities/work-request/

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Laboratory Close-out Checklist

Building: _____ Room: _____
Department: _____

Responsible Researcher(s): _____
Email: _____ Office Phone: _____ Cell Phone: _____

Staff/Faculty Completing Closeout	Signature

Lab is relocating: Yes No If so, to: Building: _____ Room: _____
Lab has been re-assigned at this time: Yes No
Lab occupancy is being transferred to: _____
Email: _____ Office Phone: _____ Cell Phone: _____

I. Chemicals	Date Completed / Initials
Chemical hoods have been cleared of all chemicals and equipment; Hoods/benches are cleaned and decontaminated	
Refrigerators, freezers, hoods and bench tops, storage cabinets cleaned and checked to ensure all chemical containers have been removed	
All waste containers of chemicals are labeled with the name of the chemical(s) and have been scheduled for disposal	
All containers securely sealed and not leaking	
Chemical Waste Pick Up Request submitted	
Applicable equipment and apparatuses decontaminated and any oil in the equipment properly drained	

All containers (beakers, flasks, etc.) emptied, contents properly disposed of, and cleaned	
II. Controlled Substances	**Date Completed / Initials**
Ownership of substance(s) transferred to another licensed individual (described and approved, in writing)	
DEA notified in writing of new location. (All appropriate forms and inventories have been completed)	
Controlled substance(s) disposed of: the date, manner of disposal, and quantity of substance/s disposed of have been recorded. Keep all disposal records	
III. Compressed Gas	**Date Completed / Initials**
Gas disconnected, caps replaced, and cylinders returned to vendors	
Lecture bottles and Map Gas cylinders disposed of via ***EH&S Waste Disposal Form***	
IV. Biological Materials	**Date Completed / Initials**
All animal tissues are disposed of in a biohazard bag and removed as infectious waste. ***Contact Biosafety Officer for assistance.***	
All free liquids removed and solids properly packaged for animal tissues fixed in Ward Safe, Caro Safe, any other non-hazardous fixative, and/or formaldehyde solution	
The fixative liquids declared as a Non-RCRA Regulated Waste have been disposed of via ***EH&S Waste Disposal Form***	
All Human blood and tissue, animal blood, bedding potentially contaminated with a pathogenic microbe, and any wastes from recombinant DNA experiments disposed of in a biohazard bag and removed as infectious medical waste	
All non-controlled pharmaceuticals disposed of via ***EH&S Waste Disposal Form***	
All filters and apparatuses that have been used to filter or contain Human blood and tissue, recombinant DNA or pathogenic microbes disposed of in a biohazard bag and removed as infectious medical waste	
All needles, scalpels and any other sharp items placed in an appropriate sharps container and removed as infectious waste	

V. Radioactive Materials	Date Completed / Initials
Notify WVU RSO as soon as the intent to vacate is known (90 days in advance).	
Prior to removing trash and any other items and defrosting freezers, conduct GM survey and/or wipe tests on all materials/surfaces to check for radiation contamination. Contaminated materials shall be disposed separately from non-contaminated materials.	
Remove all trash, including empty containers, papers, and disposable materials. Remove lab matting, absorbents or chucks from benches and cabinets, and empty all drawers. If needed, contact RSD for a radioactive disposal pail or drum for contaminated materials.	
Radiation fume hoods must be empty of all radioactive equipment and materials. Interior surfaces of the hood shall be wiped down with a soap and water solution.	
Uncontaminated broken or unwanted glassware shall be disposed of in a glass waste box with a clear plastic liner. Dispose of sharps (needles, razor blades) in approved sharps-container.	
Contact the RSD to have radioactive materials removed from the lab.	
Perform a radiation survey of the entire lab, including equipment that may have contained radioactive material (GM survey and wipe test survey) to ensure all radioactive sources have been removed and area is free of contamination. If contamination is found, decontaminate and resurvey until below background limits.	
Usage records, including Survey Records, updated, finalized and submitted to the RSD.	
All radioactive material waste containers removed/picked up by the RSD.	
Ensure all personnel have returned their dosimetry badges and/or rings to the RSD.	

VI. Equipment and Supplies	Date Completed / Initials
All equipment disinfected and decontaminated and certified as clean and safe for handling. Contact HSC Safety Office for paperwork and signage. *Must receive a signed "decontaminated" sticker from Biosafety Officer in order for equipment to be sent to surplus or the trash	
Biological safety cabinets decontaminated *	
Contaminated glassware and lab equipment that cannot be decontaminated disposed of as hazardous waste	
All chemicals, biological agents, radioactive materials, equipment, etc. used in common/shared areas properly disposed/removed.	

Department Chair (signature): _____ Date: _____
Faculty/Researcher (signature): _____ Date: _____

Comments: _____

Retain a copy of this form. Provide a copy to your Chair, HSC Safety Office, HSC Senior Associate Vice President for Research & Graduate Education, and the Associate Dean for Research in your School.

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SAFETY OFFICE CLOSE-OUT VERIFICATION

To be completed by WVU HSC Safety Office Representative, PI and Department Chair

Chemical Safety	Yes	No	N/A
Chemical hoods have been cleared of all chemicals and equipment?			
Chemical hoods have been cleaned/decontaminated?			
Was perchloric acid used in any hood/exhaust device in this lab?			
All signs (hazard, caution, etc.) removed where appropriate?			
All chemicals and controlled substances have been removed or disposed of according to WVU policy?			
Gas cylinders have been removed according to WVU policy?			
Shelves and cabinets have been cleared and cleaned/decontaminated?			
Countertops have been cleaned/decontaminated?			
Remaining equipment has been properly cleaned/decontaminated?			
Refrigerators and freezers have been cleaned/decontaminated?			
Emergency contact and hazard information (704 Posting) has been changed on lab door(s)?			

WVU HSC Safety Office Representative: _____ **Date:** _____

Biological Safety	**Yes**	**No**	**N/A**
Inside of the Biological Safety Cabinet has been properly decontaminated?			
Incubators, water baths and any other potentially contaminated equipment have been properly decontaminated and stickered/signed off by the Biosafety Officer?			
Biohazard areas have all been properly decontaminated?			
All biological waste and sharps containers have been removed/properly disposed of?			
All biological materials have been properly transferred or disposed of? If transferred, specify **where/to whom**:			
All biohazard stickers have been removed?			

WVU Biological Safety Office Representative: _____ **Date:** _____

Radioactive Materials Verification	**Yes**	**No**	**N/A**
All radioactive isotopes have been properly removed, as directed by the University Radiation Safety Officer (RSO)?			
All radioactive waste has been removed, as directed by the RSO?			
All personnel dosimetry badges have been returned?			
All equipment, glassware, lab benches, fume hoods, etc. have been emptied, cleaned, and wiped down and if necessary, decontaminated?			
Radiation Safety Department survey conducted and area/lab is <0.02 mR/hr (a.k.a. background)?			
Lab has been cleared of all Radiation Safety issues by RSO, and the RSD has removed all radiation hazard/warning signs)?			

WVU Radiation Safety Officer: _____ **Date:** _____

Institutional Animal Care and Use Committee & Office of Laboratory Animal Resources	**Yes**	**No**	**N/A**
All protocols and animals have been properly transferred or removed, as approved by OLAR and the IACUC?			

OLAR Representative: _____ **Date:** _____

IACUC Representative: _____ **Date:** _____

Required Signatures:

Faculty/Researcher (signature): _____ Date: _____

Department Chair (signature): _____ Date: _____

Trainee 1 (signature):_____ Date: _____

Trainee 2 (signature):_____ Date: _____

Trainee 3 (signature):_____ Date: _____

Comments:

_____

_____

_____

Retain a copy of this form in your departmental files. Provide a copy to your department Chair, WVU HSC Safety Office, the Senior Associate Vice President for Research & Graduate Education and the Associate Dean for Research in your School.

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Grant Transfer Agreement

Grants that will be transferred

Granting Agency	Grant Number	Title	Grant End Date	OSP Notified? Y/N

Grants that will not be transferred

Granting Agency	Grant Number	Title	Grant End Date	OSP Notified? Y/N

Department Chair: _____ Date: _____

Principal Investigator: _____ Date: _____

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Equipment and Biospecimen* Transfer Request

Equipment to be transferred to another institution

Equipment Inventory #	Description	Year Purchased	Funding Source

***Requests to transfer any/all biospecimens to another institution, including cell lines and patient samples, must be approved in advance by the Assoc. VP for Research and Graduate Education.**

Department Chair: _____ Date: _____

Principal Investigator: _____ Date: _____

Office of Research & Graduate Education: _____ Date: _____

WestVirginiaUniversity.
ROBERT C. BYRD
HEALTH SCIENCES CENTER

Equipment and Biospecimen* Transfer Request

Equipment to be transferred to another unit within WVU

Equipment Inventory #	Description	Year Purchased	Funding Source

***Requests to transfer any/all biospecimens to other units within WVU, including cell lines and patient samples, must be approved in advance by the Assoc. VP for Research and Graduate Education.**

Department Chair: _____ Date: _____

Principal Investigator: _____ Date: _____

Office of Research & Graduate Education: _____ Date: _____

WestVirginiaUniversity.
ROBERT C. BYRD
HEALTH SCIENCES CENTER

Separation of Employment Form

Name of Separating Employee: _____ Employee ID #: _____

Position Title: _____ Department: _____

Location/ Campus: _____ Date of Separation: _____

Verifying Department	*Verification Signature*	*Date*
Safety Office Close-Out Verification		
Equipment Transfer Agreement		
Grant Transfer Agreement		
Employing Department: **(Equipment, procurement card,** ID, parking pass, final time sheet/leave form entry)		
Information Technology Services: Computers have been wiped clean in preparation for surplus		
Key Return: All HSC building keys		
Human Resources Insurance/COBRA, Retirement, Paycheck instructions		

Forwarding Address: _____

_____

_____

_____

Department Administrator: _____ Date: _____

Departing Employee: _____ Date: _____

Important: This form must be completed and returned to the Department Administrator by the last day of employment to avoid delay in processing.