Laboratory Specific Chemical Hygiene Plan for Research Laboratories

This template is designed to provide an organizational framework for ensuring compliance of the individual laboratory with the OSHA Laboratory Standard [29 CFR 1910.1450]. This completed template should be used in conjunction on with the institutional UK Chemical Hygiene Plan. Other formats for the information contained in this document are acceptable if the content possesses all OSHA Laboratory Standard-required elements. Refer to the institutional UK Chemical Hygiene Plan for a list of these requirements. It is the responsibility of the laboratory's Principal Investigator/Laboratory Supervisor (specifically the lab-designated Chemical Hygiene Officer) to compile, review and update this Laboratory Specific Chemical Hygiene Plan no less than annually.

The Department of Research Safety reserves the right to request a copy of the laboratory's Lab Specific Chemical Hygiene Plan for the purposes of review and to ensure its completion and compliance with the OSHA Laboratory Standard. Upon annual Laboratory Safety inspection, the laboratory's specific CHP will be checked to ensure its annual review has been completed and that all lab staff have documented lab specific training.

Sections of the UK Laboratory-Specific CHP:

1) Principal Investigator/Laboratory Supervisor ID and review signature page
2) Laboratory Personnel page, with documentation of understanding of the CHP
3) Laboratory Personnel Training Documentation
4) Laboratory Specific Emergency Contacts
5) Laboratory Locations and Activities
6) Materials and Procedures requiring PI/Laboratory Supervisor and/or departmental approval
7) Laboratory Specific Policies
8) a. Controlling Hazards - Lab Activities and PPE Hazard Assessment
   b. Controlling Hazards - Chemical Hazards in the Laboratory
   c. Controlling Hazards - High Risk Procedures in the Laboratory
9) Safe Operation of Engineering Controls
10) Standard Operating Procedures (SOP)
11) Laboratory Specific Exposure Monitoring and Medical Surveillance
12) Laboratory Specific Chemical Inventory and Safety Data Sheets
13) Supplementary records, documentation, resources or references.

Directions: Please complete all sections of this template. Questions or requests for assistance with or completion of a Laboratory-Specific Chemical Hygiene Plan may be emailed to labsafety@uky.edu .

Section 1: **PI ID & Review**

Lab Specific Chemical Hygiene Plan

Principal Investigator:

Department:

Chemical Hygiene Officer:
(if none, this designation defaults to the listed Principal Investigator)

Emergency Contact for the Laboratory and phone:

This Chemical Hygiene Plan (CHP) is specific to the following building(s) & room number(s):

Laboratories engaged in the laboratory use of hazardous chemicals must maintain a lab-specific Chemical Hygiene Plan (CHP) which conforms to the requirements of 29 CFR 1910.1450, the Occupational Safety and Health Administration (OSHA) Occupational Exposure to Hazardous Chemicals in Laboratories Standard (Lab Standard). University of Kentucky laboratories may use this document to develop their lab-specific CHP. This cover page must specify the Principal Investigator and specific laboratory spaces where this CHP is used. In addition, all lab employees shall document required trainings such as Lab Specific Training and any trainings specific to particularly hazardous chemicals or procedures, by placing signed training forms in the CHP.

The contents of the Chemical Hygiene Plan, Laboratory Safety Manual, and Lab-specific Information have been reviewed and revised as necessary. Personnel under my supervision have been informed of all hazards in the above listed spaces, any required controls for the safe handling of hazards, trained in the procedures for safe work with hazards and are knowledgeable about emergency response procedures for the laboratory.

Principal Investigator signature and date:

⇨ _____

Laboratory Supervisor / designated Chemical Hygiene Officer signature and date:

⇨ _____

Date of Review	PI Signature	Laboratory Supervisor/CHO Signature

Research Safety

Important Telephone Numbers:
UK Worker's Care at 1-800-440-6285
University Health Services (UHS): (859) 323-APPT
UHS after hours: (859) 323-5321
For emergencies call 911 and/or proceed to UK Chandler Hospital Emergency Department

Lab Specific CHP Section 2: **Labo**ratory Personnel

Principal Investigator:

Department:

Lab Supervisor/designated Chemical Hygiene Officer:
(if none, this designation defaults to the listed Principal Investigator)

I have read and understand the contents of the Lab-Specific Chemical Hygiene Plan, including any SOPs for safe conduct of procedures utilizing chemicals which present a hazard to human health. I have been made aware of the hazards present in our laboratory, the controls that need to be implemented, and the response procedures should an emergency occur in the laboratory. I hereby acknowledge that I will comply with requirements, policies and work practices described in this plan, including completion of required training(s).

Date	Personnel Name (printed)	Personnel Signature

Research Safety

Important Telephone Numbers:
UK Worker's Care at 1-800-440-6285
University Health Services (UHS): (859) 323-APPT
UHS after hours: (859) 323-5321
For emergencies call 911 and/or proceed to UK Chandler Hospital Emergency Department

Lab Specific CHP Section 3: **Personnel Training Documentation**

The OSHA Laboratory Standard requires the following for training laboratory personnel, to be provided by the PI/Laboratory Supervisor (the designated lab Chemical Hygiene Officer):

- Methods and observations that may be used to detect the presence or release of a hazardous chemical (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.).
- The physical and health hazards of chemicals in the work area.
- The measures workers can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect workers from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used.
- The applicable details of the employer's written CHP.

The first trainings listed below are required of all personnel working in wet labs at the University of Kentucky. Add any others required for or by the lab that are provided by internal (i.e. Biosafety Training, Radia. on Safety Training, or hands-on training of specific procedures in the lab) or external (i.e. CITI) sources.

- **Chemical Hygiene/Laboratory Safety Initial and Annual Refresher Training** (online modules hosted by UK Research Safety)
- **Hazardous Waste** (online module hosted by UK EHS)
- **Fire Extinguisher** (online module hosted by UK EHS) **students under the age of 18 not enrolled at the university are exempted from the requirement for completion of this training*
- **Lab Specific Training** (general checklist provided by UK Research Safety, see next page)

Name of Training	Notes (how to access training, specific individuals only, etc.)

Please attach copies of lab-provided training materials and signed statements by employees attesting to completion and understanding of the training.

Research Safety

Laboratory Specific General Safety Training Record

Name of individual:	**Linkblue ID#:**
Principal Investigator:	**Designated Lab Supervisor:**
Building(s)/Room(s) of active work:	

This checklist may be used by University of Kentucky research laboratories to document laboratory-specific safety training for personnel. Other training on materials and procedures specific to the lab shall be added and documented as needed. Training documentation for laboratory personnel shall be stored in the laboratory's Chemical Hygiene Plan or Laboratory Safety Manual.

Please place a check mark to show that training on the topic has been completed by the above-named individual.

Emergencies	
	Location of emergency contact information for UK Police and response to medical, fire, or other emergencies.
	Worker response to building, facility, and safety equipment alarms (i.e., chemical fume hood, glove box, biological safety cabinet) including the review of established building emergency evacuation routes.
	Location and proper use of emergency equipment such as eyewash stations, fire extinguishers, fire pull stations, safety showers, first aid, and spill kits for the materials in use.
	Procedures for seeking medical attention. Reporting requirements for laboratory incidents, accidents, and near misses, particularly those relating to personal injury.
General Lab Safety	
	Contact information for lab operations (i.e., Principal Investigator, the designated Laboratory Supervisor, departmental safety liaison, facility manager, custodial services).
	Food and beverages are prohibited in the laboratory. Designated food storage and eating areas are defined for the individual.
	The physical, chemical, biological and radiological hazards of the materials present in the lab and the signs and symptoms of exposure.
	Laboratory and facilities requirements including but not limited to: • Doors to laboratory remained closed to the common corridors • Appropriate lab attire (closed toe shoes, no shorts, long hair restrained) • No gloved hands, lab coats or other PPE in hallways, restrooms, elevators and other public areas • Use of rigid-sided, lidded, and leak-proof secondary transport containers for hazardous materials • Required approvals and training for procedures and/or materials • Room or Equipment User Logs
	Types of personal protective equipment (PPE) to be used for procedures and where they are stored. The minimum PPE required of all University of Kentucky wet labs are disposable gloves, lab coat, and eye protection.
	Proper use of and any hazards presented by laboratory equipment. (i.e., thermal, electrical, mechanical). Examples of hazardous equipment are vacuum pumps, sonicators, Bunsen burners, UV lamps, microtomes, anesthesia equipment, hot plates, etc.
	Daily work practices including but not limited to: • Donning and safe doffing of PPE, particularly disposable gloves • Proper and frequent handwashing • Proper storage and disposal of materials in use
	Proper disposal of distinct types of waste in the laboratory (i.e., chemicals, biohazards, radiological, sharps)
Chemical Safety (for laboratories using hazardous chemicals)	
	Familiarity with the content and location of: • Occupational Safety and Health Administration (OSHA)Laboratory Standard [29 CFR 1910.1450] • UK General Chemical Hygiene Plan • Laboratory Specific Chemical Hygiene Plan, including Standard Operating Procedures (SOP) • Safety Data Sheets (SDS) for laboratory chemicals

Chemical Safety (cont.)	
	Detection methods, signs or symptoms of exposure or release of hazardous chemicals in the lab (i.e., odors, monitoring equipment, visual appearance) and the proper course of action if detected.
	Location of all PPE needed for procedures
	Proper use of the chemical fume hood, glovebox, blast shielding, or other exposure protection equipment and their monitoring devices/methods.
	Proper chemical segregation and storage based on hazard and compatibility, including chemical labeling requirements
	Chemical spill procedures and required reporting
Biological Safety (for laboratories using biological hazards)	
	Location and proper use of laboratory disinfectants
	Signs and symptoms associated with exposure to the hazards specific to the laboratory, including infectious agents to humans, plants, or animals, recombinant or synthetic nucleic acid materials and routes of potential exposure (needle stick, skin contact, eye splash, etc.)
	Reporting requirements for laboratory incidents and accidents, especially resulting in personal injury and/or exposure to **infectious agents and/or recombinant or synthetic nucleic acid materials**
	Biohazardous waste triage procedures (ex: autoclave vs use of effective disinfectants)
	Autoclave procedures, particularly pertaining to decontamination of biohazard waste
	Standard microbiological procedures and guidance in HHS/CDC/NIH Biosafety in Microbiological and Biomedical Laboratories (BMBL)
	Familiarity with the NIH Guidelines for Research Involving Recombinant DNA Molecules and the lab's Institutional Biosafety Committee protocol
	Proper use of Biological Safety Cabinets (BSCs), if applicable
	Biological spill procedures and required reporting
Radiation Safety (for laboratories using radiological materials or equipment with radioactive sources)	
	Location of Radiation Safety Officer name and number
	Onsite, Initial, Basic and Advanced Training, completed in order, for authorization to use radioactive materials
Hazardous Waste (for laboratories generating hazardous waste)	
	Location and types of hazardous waste containers
	Appropriate labeling of hazardous waste
	Proper hazardous waste storage and waste ticketing procedures

I have trained the above-named individual on the topics noted above as they pertain to the scope of work, materials and procedures used in my laboratory.

Principal Investigator/Designated Laboratory Supervisor signature:

Principal Investigator/Designated Laboratory Supervisor name (printed):

I have been instructed about, have read, and understand the contents and concepts presented to me, as described above, and agree to abide by the principles and instructions that have been provided to me in this training. I understand that if I have any questions about the training, materials, the information presented, or if I experience any problems in performing my tasks with potential hazards, it is my responsibility to seek clarification from the Principal Investigator or designated Laboratory Supervisor.

Laboratory Personnel signature:

Laboratory Personnel name (printed):

Lab Specific CHP Section 4: **Emergency Contacts and Procedures**

Principal Investigator	
PI Office Location	
PI Office Phone	
PI Emergency Phone	
Laboratory Supervisor	
LS Office Location	
LS Office Phone	
LS Emergency Phone	
Lab Specific Chemical Hygiene Officer [if different from the individual(s) listed above]	
LCHO Office Location	
LCHO Office Phone	
LCHO Emergency Phone	
Building or Facility Manager and Phone	
Departmental Safety Liaison (if applicable) and Phone	

EMERGENCIES: 911 For all emergencies call 911 and/or proceed to the UK Chandler Emergency Department
UK Police: (859) 257-8573
PPD Emergencies: (859) 257-2830
UK Worker's Care: (800) 440-6285
University Health Services: (859) 323-2778
University Health Services After Hours: (859) 323-5321

The laboratory's emergency evacuation route according to the Building Emergency Action Plan:

CHEMICAL SPILL KIT(S) LOCATION AND CONTENTS:

Lab Specific CHP Section 5: **Laboratory Locations and Activities Covered by the CHP**

Building	Rooms	Room Assigned to the PI (Y/N)	Shared Facility (Y/N)	Primary Activities of this location ***(i.e., microscopy, tissue culture, reagent preparation, chemical glovebox use, experimental procedures/reactions, animal work)***

Lab Specific CHP Section 6: **Materials or Procedures requiring Prior Approval**

Are there specific tasks, procedures or materials that require advance approval of the PI, Lab Supervisor, or Department before work commences? Please list any required approvals here.

PI/Laboratory Supervisor/designated lab CHO: Please check if not applicable to the laboratory.

☐ This laboratory has no requirements for obtaining prior approval for specific materials or procedures.

PLEASE PRINT

Task/Material Requiring Approval	Individual/Role Requesting Approval	Name of official issuing approval and date of approval, if received

Please attach any supplementary instructions or information to this section of the Lab Specific CHP

Lab Specific CHP Section 7: **Laboratory Specific Policies**

Lab Specific Policies not covered elsewhere in the CHP
(e.g., No personnel shall work unaccompanied after 6 pm and on weekends, Lab coats must be worn in the lab regardless of work performed, etc.).

☐ **PI/Laboratory Supervisor/designated lab CHO: Please check and sign if there are no applicable additional policies for the laboratory.**

☐ Lab coats must be worn at all times regardless of whether work is performed.

☐ To limit the spread of chemical contamination, use of personal electronic devices (e.g., laptops, ipads, cell phones, earbuds) is ☐ prohibited ☐discouraged in the following situations:

☐ To promote awareness of surroundings, including building and lab alarm sounds, use of earbuds or headphones is restricted as follows:

☐ The following areas are designated as "PPE free" areas: (Enter Description of Areas that apply). Prior to working in these areas, remove all PPE and wash hands.:

☐ Working alone requires prior approval from Principal Investigator/Laboratory Director in the following situations:

☐ Unattended experiments must be approved by Principal Investigator/Laboratory Director if they involve:

☐ Heat ☐ Circulating tap water ☐ Possible runaway reaction ☐ Other:

☐ ☐Other (Please describe):

Lab Specific CHP Section 8 (a): **Laboratory Activities and PPE Hazard Assessment**

Personal protective equipment (PPE) is usually required to perform procedures safely. The minimum PPE for procedures in wet labs at the University of Kentucky includes a lab coat, and eye protection suitable for the procedures performed. Various types of PPE in laboratory research might include:

- Protective clothing (e.g., lab coats, smocks, aprons)
- Eye and face protection (e.g., safety glasses, chemical goggles, UV or laser resistant eyewear, face shields,
- Hand protection – gloves (e.g., insulated, cut resistant, disposable or reusable)
- Respiratory protection – respirators (e.g., N95, PAPR, half/full/filtering facepiece)
- Head protection (e.g., bonnets, hard hats)
- Hearing protection (e.g., reusable muffs, reusable or disposable ear plugs)
- Protective footwear (e.g., steel-toed boots, shoe covers)

PPE should not be used as a substitute for engineering controls such as chemical fume hoods, gloveboxes, biosafety cabinets, process enclosures, *etc*., or as a substitute for good work practices and attention to washing hands after PPE is removed. The use of engineering controls such as chemical fume hoods reduces the potential for exposure yet does not eliminate the need for wearing the proper PPE.

When PPE is needed, regulations require that a hazard assessment be performed to identify the specific hazards of concern and the PPE required for protection from those hazards. This hazard assessment may be done for a work area, or for a specific experiment, job, or task. PPE is selected based on this hazard assessment. The Laboratory Standard requires the hazard assessment be documented in writing.

This form can be used to satisfy the hazard assessment and documentation requirements. Once completed, the form must be maintained in the Chemical Hygiene Plan. It also can be to train employees regarding the hazards associated with their work and the PPE required for their tasks. Employees must also receive training on the correct use, maintenance, and limitations of engineering controls and PPE. The PI/Lab Supervisor is responsible for providing or arranging for this training.

Respiratory protection may be needed for chemical handling when there are not sufficient engineering controls in place. If you believe respiratory protection is warranted, you must also contact UK Occupational Health and Safety or complete the form at: https://ohs.uky.edu/form/respiratory-hazard-assessment-fo?check_logged_in=1

The PPE listed as required in this document is based on the UK institutional Chemical Hygiene Plan and represents the minimum PPE that must be worn in each circumstance. Contact the UK Research Safety at labsafety@uky.edu if there are cases in the laboratory when less PPE may be appropriate based the presence of additional controls or other extenuating circumstances.

For more information on PPE, visit: researchsafety.uky.edu/chemical-safety

PPE Requirements per Location

Determine the minimum PPE requirements for entry into or working in labs or other spaces with hazards based on the hazard level of the chemicals within and the procedures performed. PPE for entry requirements and hazard communication in the form of the GHS pictographs shall be indicated on door signage.

A combination of clothing and shoes that fully cover the legs and feet is required when working in spaces that have hazardous chemicals, which includes almost all lab spaces. Similarly, there are requirements to have the legs covered in spaces with other hazards that could pose a risk to individuals, such as physical hazards or biological and radioactive materials that pose an exposure risk.

UK's minimum PPE requirements in wet labs are lab coat, eye protection and gloves for the procedures performed. Please outline any **minimum** lab PPE requirements for each space of the lab, if additional PPE to the UK miminum for wet labs is required for sufficient personnel protection. Include the shoe and clothing requirements, if applicable.

Location	Minimum PPE

Task and Materials Based Hazard Assessment and PPE Requirements

Mark all hazards and operations performed in the Lab. Review the applicable PPE for all checked items.
Be sure to indicate when stricter PPE usage is to be implemented in the space. This chart is not a substitute for lab specific SOPs.

Activity performed in lab?	Materials Involved	Applicable PPE	Engineering Controls and Potential Hazards
☐	Liquid chemicals	***Lab Coat*****:** required ***Eyewear*****:** Safety glasses or goggles required; face shield required if high splash risk ***Gloves*****:** Compatible gloves required ***Other:*** In case of anticipated possible splashes on whole body, chemical resistant coverall or apron	Other controls: Engineering controls based on properties of chemicals and procedures. Potential Hazards: • Skin burn • Eye damage • Skin irritation • Eye irritation • Skin sensitization (systemic reaction) • Spill on floor

Activity performed in lab?	Materials Involved	Applicable PPE	Engineering Controls and Potential Hazards
☐	Dry chemicals	***Lab Coat*:** Required *Eyewear*: Safety glasses required; dust proof safety goggles for higher hazard chemicals ***Gloves*:** Compatible gloves required; protective sleeves recommended ***Respiratory Protection*:** Respirator required if engineering controls are insufficient.	Other controls: Engineering controls based on properties of chemicals and procedures. Potential Hazards: • Inhalation of airborne particles • Contact with Eyes • Dermatitis • Skin burning • Contaminated floor and surfaces
☐	Highly exothermic reactions	***Lab Coat*:** Flame-resistant lab coat ***Eyewear*:** Goggles and face shield required ***Gloves*:** Compatible gloves required; additional fire resistant gloves may be necessary depending on the task ***Other*:** Non-synthetic street clothing required	Other controls: Engineering controls based on procedures. Potential Hazards: • Fire • Explosion • Skin/eye contact with chemicals • Skin/Eye contact with hot liquids • Inhalation of vapors/gases • Spill on floor and surfaces
☐	Corrosive liquids	***Lab Coat*:** Lab coat required; chemical-resistant (FR/CP) lab coat recommended ***Eyewear*:** Safety glasses or goggles required ***Gloves*:** Compatible gloves required ***Other*:** In case of anticipated possible splashes on whole body, chemical resistant coverall or apron	Other controls: Engineering controls based on properties of chemicals and procedures. Potential Hazards: • Eye/Skin/Respiratory burn • Eye damage • Inhalation of corrosive vapors/gases • Spill on floor
☐	Flammable liquids	***Lab Coat*:** Lab coat required; flame resistant (FR) lab coat recommended based on fire hazard ***Eyewear*:** Safety glasses or goggles required *Gloves*: Compatible gloves required ***Other*:** In case of anticipated possible splashes on whole body, chemical resistant coverall or apron	Other controls: Engineering controls based on properties of chemicals and procedures. Potential Hazards: • Fire • Explosion • Skin/Eye absorption • Inhalation of vapors/gases • Spill and evaporation in lab

Activity performed in lab?	Materials Involved	Applicable PPE	Engineering Controls and Potential Hazards
☐	Pyrophoric or water reactive compounds outside of glove box	***Lab Coat*****:** Flame-resistant lab coat required ***Eyewear*****:** Goggles required; face shield recommended ***Gloves*****:** Compatible gloves required; Flame-resistant gloves recommended ***Other*****:** Non-synthetic street clothing required	Other controls: Engineering controls based on properties of chemicals and procedures. Potential Hazards: • Fire • Explosion • Skin/Eye burn/damage • Inhalation of vapors/gases
☐	Explosive Compounds	***Lab Coat*****:** Flame resistant lab coat ***Eyewear*****:** Goggles + face shield required ***Gloves*****:** Heavyweight gloves, such as anti-static PVC gauntlets, required	Engineering Controls • Use blast shield Other Controls: Based on procedures Potential Hazards: • Fire • Explosion • Skin/Eye burn/damage • Inhalation of vapors/gases
☐	Particularly hazardous substances (PHSs) - select carcinogens, reproductive toxins, and substances with a high degree of acute toxicity	***Lab Coat*****:** Lab coat required ***Eyewear*****:** Safety glasses or goggles required ***Gloves*****:** Compatible gloves required ***Other*****:** Disposable sleeve guards may be recommended	Other controls: Engineering controls based on procedures. Potential Hazards: • Inhalation of gases and vapors • Eye/Skin absorption • Eye/Skin irritation • Skin/respiratory sensitization
☐	Toxic chemicals	***Lab Coat*****:** Lab coat required ***Eyewear*****:** Safety glasses or goggles required ***Gloves*****:** Compatible Gloves required	Other controls: Engineering controls based on procedures. Potential Hazards: • Inhalation of gases and vapors • Eye/Skin absorption • Eye/Skin irritation • Skin/respiratory sensitization

Activity performed in lab?	Materials Involved	Applicable PPE	Engineering Controls and Potential Hazards
☐	Engineered nanomaterials in solution	***Lab Coat*****:** Disposable Tyvek-type coveralls or Lab coat based on materials ***Eyewear*****:** Safety glasses or goggles required ***Gloves*****:** Compatible gloves required; double gloves recommended; Choose the proper gloves based on the solvent used	Other controls: Engineering controls based on procedures. Potential Hazards: • Eye/Skin absorption • Eye/Skin irritation • Skin/respiratory sensitization • Eating/drinking of contaminated food/drinks • Spill and surface contamination
☐	Engineered nanomaterials as dust/particles	***Lab Coat*****:** Disposable Tyvek-type coveralls or Lab coat, dependent on materials ***Eyewear*****:** Safety glasses or goggles required ***Gloves*****:** Compatible gloves required; double gloves recommended ***Respiratory Protection:*** Required if engineering controls are insufficient	Other controls: Engineering controls based on procedures. Potential Hazards: • Inhalation of airborne particles • Eye/Skin absorption • Eye/Skin irritation • Skin/respiratory sensitization • Eating/drinking of contaminated food/drinks • Spill and surface contamination
☐	Chemically preserved animal and/or human specimens	***Lab Coat*****:** Gown or lab coat required ***Eyewear*****:** Safety glasses or goggles required ***Gloves*****:** Compatible gloves required	Other controls: • Chemical fume hood • Necropsy downdraft table • Perfusion station • Local Exhaust Potential Hazards: • Inhalation of gases and vapors • Eye/Skin absorption • Eye/Skin irritation • Eating/drinking of contaminated food/drinks • Exposure to formaldehyde
☐	Cryogenic liquids or dry ice (including working with cryogenic dewars)	***Lab Coat*****:** Lab coat required ***Eyewear*****:** Safety glasses or goggles required; face shield required when handling cryogenic liquids or cryogenically frozen tubes ***Gloves*****:** Insulated cryogenic gloves required	Potential Hazards: • Skin burn • Eye burn • Asphyxiation • Frostbite of limbs

Activity performed in lab?	Materials Involved	Applicable PPE	Engineering Controls and Potential Hazards
☐	Compressed gases	***Lab Coat*:** Lab coat required ***Eyewear*:** Safety glasses or goggles required ***Gloves*:** Gloves required dependent on task (e.g., work gloves when handling cylinders, chemical-resistant gloves when making/breaking connections with non-inert gases) ***Respiratory Protection*:** May be needed when handling toxic gases	Other Controls: • Gas cabinets and/or monitors may be required depending on type of gas. Potential Hazards: • Inhalation of gases and vapors • Eye/Skin absorption • Asphyxiation • Explosion
☐	Hydrofluoric acid	***Lab Coat*:** Lab coat required; chemical-resistant (FR/CP) lab coat recommended (refer to lab SOP) ***Eyewear***: Safety goggles and face shield required (refer to lab SOP) ***Gloves*:** Neoprene gloves or double-nitrile gloves required (refer to lab SOP) ***Other*:** Acid resistant apron required (refer to lab SOP)	Other Controls • Engineering controls based on procedures • Calcium Gluconate gel Potential Hazards: • Inhalation of HF vapors • Eye/Skin absorption • Systemic poisoning • Eating/drinking of contaminated food/drinks • Eye/Skin burn
☐	Aqua regia	***Lab Coat*:** Lab coat required; chemical-resistant (FR/CP) lab coat recommended (refer to lab SOP) ***Eyewear*:** Safety goggles required; Face shield recommended (refer to lab SOP) ***Gloves*:** Neoprene gloves required (refer to lab SOP) ***Other*:** Neoprene gauntlets and apron may be required (refer to lab SOP)	Other Controls • Engineering controls based on procedures Potential Hazards: • Inhalation of acid vapors and toxic gases • Eye/Skin absorption • Eating/drinking of contaminated food/drinks • Eye/Skin/Respiratory burn • Explosion
☐	Piranha solution	***Lab Coat***: Lab coat required; chemical-resistant (FR/CP) lab coat recommended (refer to lab SOP) ***Eyewear*:** Safety goggles required; Face shield recommended (refer to lab SOP) ***Gloves*:** Neoprene gloves required (refer to lab SOP) ***Other*:** Neoprene gauntlets and apron may be required (refer to lab SOP)	Other Controls • Engineering controls based on procedures Potential Hazards: • Inhalation of acid vapors and toxic gases • Eye/Skin absorption • Eating/drinking of contaminated food/drinks • Eye/Skin/Respiratory burn • Explosion

Activity performed in lab?	Materials Involved	Applicable PPE	Engineering Controls and Potential Hazards
☐	Bromine	***Lab Coat*****:** Lab coat required; chemical-resistant (FR/CP) lab coat recommended (refer to lab SOP) ***Eyewear*****:** Safety goggles required; Face shield recommended ***Gloves*****:** Fluorinated rubber gloves required for liquid bromine; nitrile or neoprene gloves required for aqueous solutions of bromine	Other Controls • Engineering controls based on procedures Potential Hazards: • Inhalation of gas and vapor • Eye/Skin absorption • Skin/ Eye burn and damage • Respiratory irritation
☐	Phenol	***Lab Coat*****:** Lab coat required; chemical-resistant (FR/CP) lab coat recommended ***Eyewear*****:** Safety glasses or goggles required ***Gloves*****:** Double Nitrile gloves, Neoprene ***Other*****:** Neoprene gauntlets and apron may be required	Other Controls • Engineering controls based on procedures Potential Hazards: • Eye/Skin absorption • Respiratory irritation • Eating/drinking of contaminated food/drinks • Respiratory and skin sensitizer • Skin/ Eye burn • Germ cell mutagen
☐	Animal Surgery	***Lab Coat*****:** Lab coat required ***Eyewear*****:** Safety glasses or goggles recommended; ***Gloves*****:** Nitrile or latex gloves required; puncture-resistant gloves may be recommended Additional, depending on materials administered.	Other controls: • Local Exhaust • Use of tightly sealed and uncracked induction chambers • Use of dated and weighed scavenger cannisters • Use of somniflow • Use of certified anesthesia vaporizer Potential Hazard: • Exposure to anesthetics
☐	Perfusion using paraformaldehyde	***Lab Coat*****:** Lab coat required ***Eyewear*****:** Safety glasses or goggles required ***Gloves*****:** Nitrile gloves required ***Respiratory Protection*****:** Dependent on location of work, if engineering controls are unavailable.	Other controls: • Chemical fume hood • Necropsy downdraft table • Perfusion station • Local Exhaust Potential Hazard: • Skin sensitizer, skin burns • Irritation to the eyes, nose, throat, and respiratory system; • Lacrimation • Cough; wheezing

Additional Activities

Please any additional activities not previously listed and describe the hazards and PPE. The purpose of this chart is to describe discrete tasks with limited chemical use. Lengthy chemical procedures and processes are to be documented in the CHP as lab SOP an example has been provided. Attach additional pages as needed.

Task or Activity	Applicable PPE	Engineering Controls and Potential Hazards
Handling hot items (e.g., autoclaved materials, furnaces, heated glassware, water or oil bath)	***Lab Coat*****:** Lab coat required *Eyewear*: Safety glasses or goggles required ***Gloves*****:** Thermally insulated gloves required; wear chemical-resistant gloves underneath, as needed	Mild to severe skin burns
Removing freezer vials from liquid nitrogen	***Lab Coat*****:** Lab coat required *Eyewear*: Safety glasses and face shield required ***Gloves*****:** Insulated cryogenic gloves required; wear nitrile or latex gloves underneath if handling biological vials ***Other***: Closed-toed, impermeable shoes required	Skin burn, frostbite
Centrifuge	***Eyewear*****:** Safety glasses or goggles required ***Other*****:** If centrifuging hazardous materials, wear additional PPE to match the hazard	Explosion, burst tubes, contaminated centrifuge. Exposure to materials through splash, abrasions.

Lab Specific CHP Section 8 (b): **Chemical Hazards Present in the Lab**

Please check all that apply. Enter requested information where indicated.

CHEMICAL HAZARDS	If checked, enter requested information where indicated.
☐ Acrylamide (unpolymerized)	☐ Used to make gels ☐ For use in other chemical reactions
☐ Aqua Regia	
☐ Biologically-derived toxins (e.g., diptheria toxin, cholera toxin)	List:
☐ β-Mercaptoethanol	
☐ Chloroform	☐ Not stabilized ☐ Stabilized with:
☐ Compressed Gas Cylinders	List:
☐ Corrosives	List:
☐ Cryogens (e.g., liquid nitrogen and dry ice)	List:
☐ Cyanide Salts (e.g., potassium cyanide and sodium cyanide)	List:
☐ Dichloromethane/ Methylene Chloride	
☐ Diethyl ether	
☐ Ethidium Bromide	
☐ Explosives (including Picric Acid)*	List:
☐ Flammable Liquids	List:
☐ Formalin, formaldehyde solutions, and paraformaldehyde	
☐ Hydrofluoric Acid	
☐ HF Releasers (e.g., sodium fluoride, PMSF, potassium fluoride)	List:
☐ Nanomaterials (e.g., carbon nanotubes, dendrimers, lipid-based)	List:
☐ My lab synthesizes nanomaterials	

☐ Nitric Acid

☐ Oxidizers List:

☐ Osmium Tetroxide

☐ Perchloric Acid

☐ High Hazard Use (procedures include concentrations greater than 70% or heating)

☐ Phenol

☐ Phosgene

☐ Piranha solution

☐ Pressure and Vacuum* List equipment/materials:

☐ Reactive Chemicals: pyrophoric, water sensitive, water reactive, and other highly reactive materials (e.g., trichlorosilane, nickel carbonyl, aluminum hydride, potassium metal) List:

☐ Sodium Azide*

- No SOP needed for sodium azide present at <1% in a pre-made kit
- Generic SOP when used as preservative
- Lab-specific SOP required when used in chemical reactions

☐ Sulfuric Acid

☐ Tetrahydrofuran

☐ **PHS**: Acutely toxic, toxic to reproduction, or carcinogenic **liquids** (e.g. dimethylformamide, toluene) List:

☐ PHS List is available as a separate document elsewhere.

☐ **PHS**: Acutely toxic, toxic to reproduction, or carcinogenic **solids/powders, suspensions or solutions** (e.g. imidazole, trypan blue, tamoxifen, doxorubicin) List:

☐ PHS List is available as a separate document elsewhere.

☐ **PHS**: Acutely toxic, toxic to reproduction, or carcinogenic **gases** (e.g. chlorine, carbon monoxide) List:

☐ PHS List is available as a separate document elsewhere.

Lab Specific CHP Section 8 (c): **High Risk Procedures in the Lab**

High-risk chemical procedures are lab procedures that pose significant risk of serious injury or major property damage if a malfunction were to occur (such as a utility outage, runaway reaction, container failure, or chemical spill/release) and/or which require any of the following:

- Engineering controls **more specialized** than good room ventilation, chemical fume hoods, biological safety cabinets and/or local exhaust such as snorkel or canopy hoods.*
- Personal protective equipment **in addition to** gloves, lab coats, eye/face protection and/or chemical or thermal protective aprons or sleeves.
- **Chemical-specific first aid** treatments or antidotes.

*More specialized engineering controls include (but are not limited to): inert-atmosphere glove boxes used for employee safety, ventilated gas cabinets, oxygen monitors, and/or toxic gas monitors.

A lab-specific SOP, approved by the PI and kept with this plan, is required for all high-risk procedures!

Please check all that apply:

☐ Use of liquid nitrogen or other cryogens in large quantities or in a manner that could displace oxygen. Specify cryogen(s), amount(s), task (if applicable), location {Building and Room number) and approximate room dimensions:

- "Large quantities" include any cryogen piped in from a tank located outside the building.
- For Liquid Nitrogen, "large quantities" would be more than one freezer and one attached liquid cylinder per room. Filling a cryocart or cooler is a task that could displace oxygen.
- Re-evaluation is required if the above-mentioned quantities or tasks move to a different room, or if there is a significant change in procedures or ventilation.

☐ Heating of concentrated perchloric acid (70% or higher). Indicate location, concentration, amount, and frequency of use:

☐ Use of chemicals that are GHS Acutely Toxic Category 1 by inhalation or skin contact in the concentration purchased. List acutely toxic chemicals in the lab:

☐ Creation or synthesis of nanomaterials where the nano-sized compound is particularly hazardous or high risk. List materials created, including size of particles, and indicate if materials are created as a powder or in suspension:

☐ Use of chemicals for which an antidote or specific first-aid treatment is required (e.g., HF, phenol). List chemical, quantities and concentration in use.

☐ Use of reactive, pyrophoric & explosive chemicals. List chemicals and quantities use.

☐ Chemical procedures involving pressure, vacuum, or heat when failure of the container could result in significant physical hazards, exposure to toxic materials, or fire. List procedures:

☐ Other chemical high risk procedures meeting the definition at the top of this section. List specific procedures/equipment and hazards:

☐ **Our lab does not perform any chemical high-risk procedures based on the definition and examples listed above.**

Signature of PI/Lab Supervisor _____

Lab Specific CHP Section 9: Safe Operations of Engineering Controls

Please check all that apply.

☐ **Chemical fume hood (CFH)**

1. **Ensure the CFH has been certified within the last year.** The last certification date is found on a brightly colored sticker on the side of the CFH and is placed by UK OHS at the time of certification. If a CFH has not been certified within the year or has any other signage indicating it is out of order, it shall not be used.
2. **Verify that hood is under negative pressure** by doing the following:
   - ☐ Check digital monitor for flow rate between 80 and 120 fpm. When sash is at maximum safe height indicated on hood (indicated on the certification sticker), flow rate should be close to that shown on most recent certification sticker.
   - ☐ Check magnehelic gauge to verify that pressure needle lines up closely with set point.
   - ☐ Other:

a. **Position sash correctly for work:**

☐ **CFH Vertical Sash:** Hood sash moves vertically – keep sash in lowest practical position while working (no higher than 18" opening). Sash must come down to shoulder height or lower.

☐ **CFH Combination Sash**

- For maximum flexibility, route tubes and cords under airfoil or through access at side of hood. If this is not possible, route these connections under the sash. Avoid running tubes or cords between horizontal sash panels.
- Keep horizontal panels closed and move sash vertically during work. Keep sash in lowest practical position while working. Sash must come down to shoulder height or lower. Alternatively, close sash vertically. Place one sash panel between body and the work in the hood. Work with arms reaching around this sash panel.

☐ **Biological safety cabinet (BSC):** Our lab uses a biological safety cabinet for handling of powdered chemicals or water-based solutions/suspensions.

1. Look for certification date within the last year on sticker on or around the sash. If the BSC has not been certified within the last year, it shall not be used for work. Contact the UK contracted vendor listed on the certification sticker to arrange its certification. NOTE: BSCs shall not be used for volatile chemicals.
2. With BSC turned on, verify flow rate by referencing the set point listed on the certification sticker or marked on the magnahelic guage.
3. Work with slow, gentle motions to prevent disruption of laminar flow.
4. Decontaminate BSC after use with suitable disinfectants (refer to approved IBC protocol)

☐ **Local snorkel exhaust:** Our lab has "snorkel" exhaust to remove hazardous vapors from the benchtop. The snorkel must be placed as close as possible to the point of contaminant generation (typically within 4 – 6 inches). Contact UK OHS if you exhibit signs of exposure to hazardous or volatile chemicals or otherwise believe the lab snorkel is not capturing contaminants or odors sufficiently.

☐ **Other:**

For "Other" (e.g., inert gas environment glovebox) Please attach instructions to ensure safe operations by lab personnel.

Lab Specific CHP Section 10: **Standard Operating Procedures**

The OSHA Lab Standard requires documented standard operating procedures for laboratory work involving hazardous chemicals. Please review the UK institutional CHP for more detailed information on SOP requirements.

No single format for a lab SOP is required, but to be considered valid, **SOP must include:**

1) Lab-specific information
2) Hazard identification
3) Hazard controls (administrative, engineering and PPE)
4) Stepwise description of how the procedure is performed safely
5) Instructions for exposure, emergencies, and spill procedures
6) Instructions for proper disposal of chemical or experimental waste
7) Documented personnel training on and understanding of the SOP

A SOP fillable template for use by research labs is available on the Research Safety website and also attached to this section of the Lab Specific CHP Template.

To assist in the laboratory's documentation of SOPs, please reference the following page. This chart provides guidance for when a Lab Specific SOP is absolutely required, versus using more general guidelines and generic SOPs (available on the Research Safety website or elsewhere) to cover multiple processes and chemicals.

Please consult the manufacturers' SDS or NIH PubChem for GHS categorization of the chemicals in use in laboratory procedures. The level of hazard of both the chemical as well as the procedures determine how SOPs are documented.

If further assistance is required, please email labsafety@uky.edu

Please attach all general SOPs or guidelines AND Laboratory-Specific SOPs to this section of the Lab- Specific CHP

General Chemical Description:	Particularly Hazardous Substances and High Risk Chemicals	Hazardous Chemicals
SOP Requirement for Lab:	**Lab-Specific SOP** **Required** for the procedures in the lab. Maintain copy in CHP	May use general hazard class guidelines or SOP. Maintain copy in CHP unless procedures call for greater than the minimum PPE for wet labs and/or if engineering controls (e.g., CFH) are not available.
GHS Hazard Class (refer to SDS or PubChem)	**GHS Hazard Category**	
Acutely toxic – *dermal or inhalation*	1 or 2	3 or 4
Acutely toxic – *oral*	1	2
Carcinogen	1, 1A or 1B, 2	
Reproductive Hazard (Fetal or Fertility)	1, 1A or 1B, 2	
Mutagen	1A, 1B, 2	
Specific Target Organ toxicity	Single Exposure: 1 and 2	Repeated Exposure: 1, 2
Sensitizer (skin or respiratory)	Dermal 1A, Respiratory 1, 1B	
Respiratory irritant		3
Skin Corrosion/irritation		1A, 1B, 1C
Eye Damage/Irritation		1
Substances which, in contact with water, emit flammable gases	1, 2	3
Pyrophoric gas, liquid, or solid	1	
Explosives	Unstable or Div 1.1 – 1.3	Div 1.4 – 1.6
Self-reactive or Organic peroxides	Type A and B	Type C, D, E, F, or G
Self-heating	1	2
Flammable		Liquid, Solid, Gas, aerosol: 1,2,3
Oxidizing	Liquid & solid 1	Liquid & solid 2, 3, gas: 1, 2, 3
Gases under pressure	Acutely toxic gases; Pyrophoric gases: Refrigerated liquified gases (cryogens) in large quantities.	Simple Asphyxiants
Corrosive to Metals	1	
OTHER HAZARDS & DESIGNATIONS		
*Non-GHS Carcinogen Designations	NTP Known or reasonably anticipated; IARC Group 1, 2A, or 2B; OSHA listed carcinogens	
Nanoparticles	Synthesis of nanoparticles with chemical components	Use of preformulated nanoparticles for use in vitro or in vivo applications
Investigational Drugs	If properties of the drug are unknown, it is considered a high hazard risk. Consecutive procedures with the drug, after synthesis, require an SOP Investigational Drugs received from or shipped to other investigators must be shipped with an OSHA 29 CFR 1910.1200 compliant SDS. Ref: https://www.osha.gov/laws-regs/standardinterpretations/1991-09-09-0	ONLY investigational drugs synthesized and worked with solely in the PI's lab. SOP for component chemicals maintained in CHP.
EU/Other	Contact with water yields toxic gas; Contact with acids yields (very) toxic gas	Toxic by Eye Contact
EU/Other	Reacts violently with water; Corrosive to Respiratory Tract	May form explosive peroxides
EU/Other	Explosive when dry; Explosive with or without air contact; Strong Hydrogen Fluoride Releaser	Lachrymator

Standard Operating Procedure:

Laboratory Information

Department:	
Principal Investigator(s):	
Laboratory Manager/Supervisor (or designated laboratory-specific chemical hygiene officer):	
Laboratory **emergency contact** (name and phone):	
Laboratory phone:	
Designated area (s) of these procedures with chemicals(s): (building and room):	
Agent storage location (building and room) and specifics regarding location/container/cabinets:	

Chemical Information

Chemical Name(s), including CAS No:	
GHS Classification and Hazard Statements (see SDS sheet provided by the chemical's manufacturer): **Example:** *Ethanol: H225: Highly Flammable liquid and vapor [Danger Flammable liquids]; H319: Causes serious eye irritation [Warning Serious eye damage/eye irritation]*	

Signs and symptoms of exposure or release	
Routes of exposure	
Required engineering controls: (i.e., chemical fume hood, biological safety cabinet, glove box, temperature control, humidity control, shielding, luer-lock syringe, in-line HEPA filter,etc.)	
Personal Protective Equipment (PPE) required for procedures:	
Known incompatibilities with chemical(s):	
Special storage and handling considerations:	
Please list the approximate amount(s) of chemical(s) utilized in all procedures	

Please describe, in a stepwise fashion, the work practices and procedures involved in the handling and utilization of this agent. **Please be clear and complete in the description of procedures (i.e., measuring, weighing, pouring, mixing, injection, mixing, transporting, administration to animals, heating, etc.).** **Be sure to include any precautionary safety steps undertaken during these procedures.** **Please submit additional pages, if necessary.**	

Waste collection and disposal procedures:	Waste chemicals shall be collected in a secured area. The area shall be free from evidence of spills. A Hazardous Waste label shall be affixed to the collection container and components shall be listed on the label as they are introduced into the container. **Do not date containers until the day of scheduled pickup**. Additionally, the container shall be marked with the hazard class of the chemical waste (i.e., Ignitable, Toxic, Reactive, Corrosive). When the container is no more than 2/3 full, date the container and submit a pick-up request in the UK E-trax system: https://etrax.chematix.com/Chematix/
Spill procedure: Lab Specific Notes on Spill Response:	**Major spills of stock solution**: Leave the area and notify others not to enter. Report the spill to the UK Environmental Quality Management Department (EQMD)at (859) 323-6280 (M-F 8am-5pm) or after hours by dialing 911 from any on-campus phone or by contacting the UK Police at (859) 257-UKPD (8573). **Minor spills of manageable amount:** If necessary, contact EQMD for guidance. Consult manufacturer's SDS for instructions and compatibilities for your chemical (Be aware of any materials such as paper towels or water that could be incompatible with your spilled chemical!
Response procedures in the case of an incident or injury:	UK Employees: • After receiving first aid (refer to the chemical's SDS), report the occupational exposure to a hazardous chemical to UK Worker's Care at 1-800-440-6285. • If needed, an appointment will be made for the employee at UK UHS. • For severe emergency or injury, call 911 or proceed to the UK Chandler Hospital Emergency Department UK Students: • Call UHS at (859) 323-APPT to report an occupational exposure to a chemical hazard. • If needed, an appointment will be made for the employee at UK UHS. **For severe emergency or injury, call 911 or proceed to the UK Chandler Hospital Emergency Department** Additional Lab-Specific Emergency Procedures:

A copy of the manufacturer's SDS for this agent and the PI approved SOP shall be kept in the lab's Chemical Hygiene Plan (CHP). The CHP shall be stored in a location known to all laboratory personnel and is accessible during work hours.

Personnel Training

- Prior to conducting any work with (name of the chemical), designated personnel must be provided training specific to the hazard involved in working with the substance.
- The PI must provide his/her lab personnel with a copy of the SOP and a copy of the SDS provided by the manufacturer. Any further training materials must be documented and stored in the lab's Laboratory Safety Manual and available to internal UK or external oversight agency inspectors.
- The PI must ensure that his/her lab personnel have completed the initial and the consecutive annually required Chemical Hygiene trainings and Hazardous Waste training.

The undersigned have read and understood the content of this SOP and the SDS for:

Lab personnel performing procedures with this agent (typed name)	Date of hands-on training for this agent	Name of person who provided the agent specific training (typed name):	Signature of Lab Personnel

SOP Reviewed and Approved by:

PI: (typed name)	
PI: (signature and date)	
Lab Manager/Supervisor (typed name)	
Lab Manager/Supervisor (signature and date)	

Lab Specific CHP Section 11: Exposure Monitoring and Medical Surveillance

Where exposure monitoring reveals an exposure level routinely above the action level (or in the absence of an action level, the PEL) for an OSHA regulated substance for which there are exposure monitoring and medical surveillance requirements, medical surveillance must be established for the affected worker(s) as prescribed by the particular standard.

In some instances, may be necessary to perform personnel exposure monitoring when administrative controls, engineering controls, and PPE may not be sufficient for full protection from exposure to a hazardous chemical. This can occur when chemical exposure levels approach or exceed OSHA's Permissible Exposure Limit (PEL) and/or ACGIH's Threshold Limit Value (TLV). This is usually indicated when engineering controls, such as a chemical fume hood, cannot be used for procedures.

Please describe any specific procedures, tasks, or materials that have the potential for exposure of lab personnel to hazardous chemicals in amounts exceeding the established PEL/TLV.

PI/Laboratory Supervisor/designated lab CHO: Please check if not applicable to the laboratory.

☐ Permissible exposure limits for hazardous chemicals in use are not exceeded in this lab.

☐ This laboratory has no requirements for exposure monitoring or medical surveillance.

Please attach any supplementary documentation, instructions, or information relevant to the specific lab's exposure monitoring or medical surveillance to this section of the Lab Specific CHP

Lab Specific CHP Section 12: **Chemical Inventory and Safety Data Sheets**

Federal regulations require that Safety Data Sheets (SDS) be maintained and readily accessible for all hazardous chemicals. University of Kentucky Research Safety, the UK CHP, the UK Chemical Safety Committee, and best practices stipulate that laboratory inventories of hazardous chemicals be updated on no less than an annual basis.

Hazardous chemicals are those with the following GHS characterizations:

- Carcinogenic or otherwise harmful to human health
- Irritant, dermal sensitization
- Corrosive
- Flammable
- Oxidizing
- Reactive/Explosive
- Toxic
- Harmful to the environment
- Liquids and gases under pressure, including liquid nitrogen tanks and compressed air cylinders

Regardless of the method the laboratory uses to inventory their hazardous chemicals, all research labs at the university are asked to update their chemical inventories in the CHEMATIX chemical inventory system every year in conjunction with the Lab Safety Inspection. This furthers compliance by keeping accurate totals of hazardous material storage within acceptable regulatory limits, informs our first responders in the event of an emergency, and facilitates prompt chemical waste pickup.

Please provide a description of where the SDSs are stored and how inventory records are maintained.

Format of the SDS: ☐ Electronic ☐ Hard Copy ☐ Other (explain below)

Location of the SDS:

Method of Maintaining Inventory: ☐ SciShield ☐ Lab Archives ☐ Quartzy ☐ Other (explain below)

Location of Inventory Records: