

# WSU LAB MANAGEMENT PLAN

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**Section 1 – Safety Program - Key Personnel**

In addition to the following personnel, please include key personnel in your department's safety program.

<u>Name</u>	<u>Position</u>	<u>Phone</u>	<u>Email</u>
Michael Strickland	Director, Environmental Health & Safety (EHS)	978-3347	<a href="mailto:michael.strickland@wichita.edu">michael.strickland@wichita.edu</a>

**Department Safety Contact:**

(Name) \_\_\_\_\_ (Position) \_\_\_\_\_ (Phone) \_\_\_\_\_ (Email) \_\_\_\_\_

**Lab Safety Contact:**

(Name) \_\_\_\_\_ (Position) \_\_\_\_\_ (Phone) \_\_\_\_\_ (Email) \_\_\_\_\_

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**Section 2 – Laboratory Contact Information**

This Chemical Hygiene Notebook pertains to the laboratories and the research facilities of:

Laboratory Room(s) and Building:

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Laboratory Phone Number(s):

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Name of Principal Investigator:

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Emergency Phone Number(s):

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Name of Lab Safety Contact (*if different than PI*):

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Emergency Phone Number(s):

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Names of Other Lab Personnel and Users:

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Emergency Phone Number:

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List all rooms related to the above mentioned laboratory / research facility. Include all rooms such as temperature controlled rooms, storage closets, and animal facilities associated with laboratory activities. Identify the faculty who currently oversee the rooms indicated.

Related Room(s):

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Faculty Supervisor:

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Phone Number(s):

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**Section 4 – Lab and Building-Specific Evacuation Information**

To report an emergency: dial **911** from a campus phone  
(978-3450 from a cell phone)

Building Manager / Emergency Coordinator: \_\_\_\_\_

Supervisor(s) for this area: \_\_\_\_\_

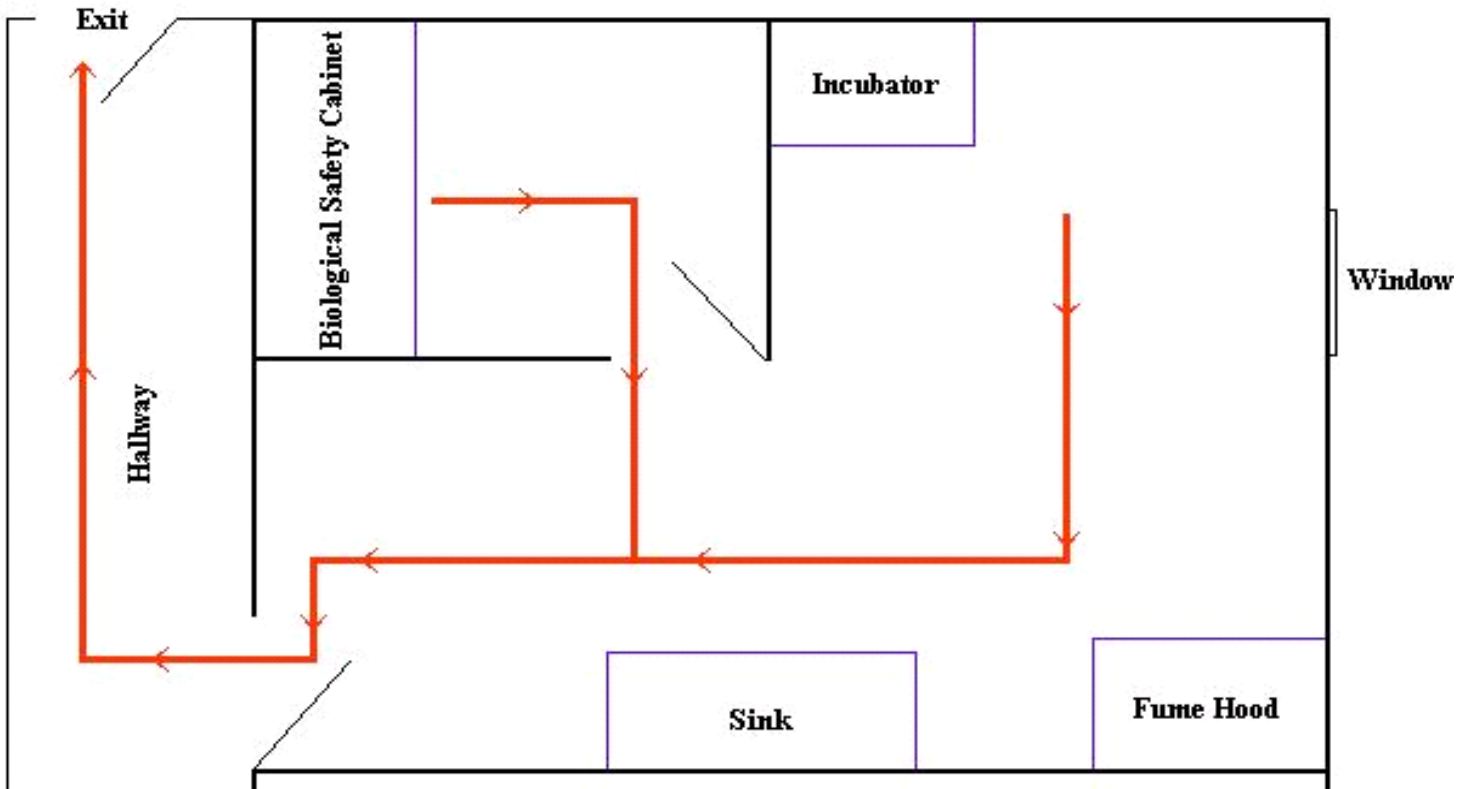
\_\_\_\_\_

\_\_\_\_\_

Designated assembly areas: \_\_\_\_\_

\_\_\_\_\_

**Example Emergency Egress Map**



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## Section 5 – Chemical Inventory

Each laboratory is responsible for creating and maintaining its own chemical inventory. A copy of the annual inventory is to be placed in this section.

A chemical inventory should have a clear title and heading, which includes the following information:

- Room number and building name
- Department
- Name of person creating/updating the inventory
- Date of inventory

There is no specific required format for the information provided in the Chemical List, although a format is provided on the following page. Principal Investigators should also consider their own needs for chemical management. A chemical inventory should strive to identify the following:

- Chemical name
- Approximate quantity
- Basic hazard information or classification
- Location
- If chemical is reordered
- If quantity changes significantly

The Hazard Classifications can be identified with notations such as the following (suggested by EHS):

<b>BIO</b>	Biohazard	<b>NON</b>	Non-Hazardous
<b>CARC</b>	Carcinogen	<b>OX</b>	Oxidizer
<b>CG</b>	Compressed Gas	<b>PF</b>	Peroxide-Former
<b>CMB</b>	Combustible	<b>PYR</b>	Pyrophoric
<b>COR-A</b>	Corrosive - Acid	<b>R</b>	Reactive
<b>COR-B</b>	Corrosive – Base/Caustic	<b>RAD</b>	Radioactive
<b>EXP</b>	Explosive	<b>RTX</b>	Reproductive Toxin
<b>F</b>	Flammable	<b>SEN</b>	Sensitizer
<b>HTX</b>	Highly Toxic	<b>TOX</b>	Toxic
<b>IR</b>	Irritant	<b>WR</b>	Water-Reactive

A chemical may belong to more than one Hazard Class. It is the responsibility of the Principal Investigator to determine if chemicals in use or in storage produce a potential hazard that must be identified on the Chemical List.

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**Chemical Inventory Form**  
(page \_\_ of \_\_)

**Location:** \_\_\_\_\_

**Name:** \_\_\_\_\_

**Department:** \_\_\_\_\_

**Date:** \_\_\_\_\_

<b>Chemical Name (*)</b>	<b>Quantity</b>	<b>Hazard Class(es)</b>	<b>Location</b>	<b>Date Received</b>	<b>Date Removed</b>

(\*) Asterisk identifies a chemical as one of the laboratory's "Top 20" chemicals (see Section 6 of the Laboratory Management Plan).

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### **Section 6 –Safety Data Sheets (SDSs)**

This section should contain SDSs for the laboratory's "Top 20" chemicals – the 20 most hazardous, largest volume, or most frequently used materials. This section should also minimally include the location of SDSs for any other special materials or particularly hazardous chemicals – acute toxins, carcinogens and reproductive toxins – used in this laboratory.

Each lab is responsible for obtaining and maintaining copies of relevant SDSs. Make sure SDSs correlate to the chemical manufacturer and composition. Most SDSs can be quickly found through links to the chemical manufacturer's web site. EHS can assist with obtaining SDSs that are difficult to find. If there are a large number of SDSs, then it may be appropriate to place them in a separate SDS Notebook, to be kept in a specified location (noted below).

The SDS Notebook is located: \_\_\_\_\_





**LABORATORY STANDARD OPERATING PROCEDURE**  
**(for the use of hazardous materials or equipment)**

**NAME OF PROCEDURE:**

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**PREPARED BY:**

**REVISION DATE:**

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**LOCATION – This procedure may be performed at the following location(s):**

**HAZARDS – The materials and equipment associated with this procedure present the following exposure or physical health hazards. Safety precautions are prudent and mandatory:**

**ENGINEERING CONTROLS – Prior to performing this procedure, the following safety equipment must be accessible and ready for use, e.g., chemical fume hood, biological safety cabinet, laminar flow hood, chemical spill kits, etc.**

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**PROTECTIVE EQUIPMENT** – Prior to performing this procedure, the following personal protective equipment must be obtained and ready for use, e.g., acid resistant gloves, safety eyewear, lab coat, chemical splash apron, etc.

**WASTE DISPOSAL** – This procedure will result in the follow regulated waste which must be disposed of in compliance with environmental regulations:

**ACCIDENTAL SPILL** – In the event that a hazardous material spills during this procedure, be prepared to execute the following emergency procedure:

**PRIOR APPROVAL** – This procedure is considered hazardous enough to warrant prior approval from the Principal Investigator.

- YES -

- NO -

**CERTIFICATION** – I have read and understand the above SOP. I agree to contact my Supervisor or Lab Manager if I plan to modify this procedure.

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Signature

Name (Print)

Date

Building & Room #

## Section 8 – Employee Training

The Principal Investigator / Laboratory Supervisor is responsible for ensuring that all laboratory personnel get the appropriate safety training. This may be achieved on site-specific chemical hazards and safety procedures, as determined by the Principal Investigator / Laboratory Supervisor.

By law all laboratory personnel should receive training on how to protect themselves from the hazards present at their locations. Research laboratories are hazardous workplaces where highly skilled personnel carry out finely detailed work. As such it is important that all laboratory personnel are competent to perform their research activities effectively, and competent to do so safely – without damaging equipment, without harming themselves and without harming their neighboring researchers.

Documented training serves as one building block of competence, together with verbal and hands-on instruction. Documentation is a necessary part of an effective training program, although it is no guarantee of personnel competence. Naturally, on-going interaction with knowledgeable researchers should continue beyond the documented phases of training to ensure the proper skills are imparted to new research personnel.

Safety training records should be kept in this section for each person using the laboratory, including the Principal Investigator. Records should minimally include the person trained, the type of training (e.g., General Lab Safety Lecture, a laboratory-specific training topic), the trainer (e.g., EHS, Principal Investigator), and the training date.

Three examples of lab-specific training records are provided on the pages which follow. These forms serve slightly different functions and may be used as needed:

### **Employee-Specific Chemical Hygiene Training Form**

The concept behind this form is the personal training file, a collection of the training received by an individual. Under “Description of Training” reference can be made to other documentation if more than a short description is desired. However, if training records are organized only by person, it becomes difficult to search training records by topic.

### **Safety Training Checklist**

The Safety Training Checklist provides a structure for covering a set of predetermined topics in a training program. It is particularly useful for conducting orientation training, as it helps remind the trainer about topics to cover. Each item on the checklist can point to other documents which describe the training content. If the checklist provided here is used, trainer and trainee can sign and date points as they are completed. Additionally, not all points of the checklist need apply to all personnel, and certain points may be reserved until they are applicable for an individual.

### **Training Sign-in Sheet**

A sign in sheet is appropriate for recording all attendees at a large training session. However, if training records are organized only by topic, it becomes difficult to answer the question, “What training has a given person received?”



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## SAFETY TRAINING CHECKLIST

This checklist may be used to assist employers with the laboratory-specific training requirements outlined in the WSU Laboratory Management Plan.

- Introduction to laboratory-specific Chemical Hygiene Plan (CHP) and the Hazard Communication program at Wichita State University:
  - Location and contents
- Review Chemical Inventory.
- Review location of SDSs.
- Review emergency information: Spills, Personal Injury, Fire, and Power Failure.
  - Fire extinguisher
  - First aid supplies
  - Safety shower
  - Eye wash
  - Evacuation plans
- Basic Safety Rules
  - Note rules with special importance for your laboratory.
  - Identify specific areas for food consumption outside of the lab.
  - Review procedures for working after hours.
- Review Waste Handling Procedures.
  - Labeling
  - Packaging
  - Pick-ups
- Review procedures for chemical procurement, distribution, and storage.
- Review Laboratory Specific Operation Procedures for use of hazardous materials
  - Storage (acid cabinet, flammable liquid storage cabinet, flammable liquid storage refrigerator, etc.)
  - Personal Protective Equipment (PPE)
  - Location where certain procedure(s) may be performed (e.g., mechanical ventilation required)
  - Waste Disposal (aqueous, solid, biohazardous, and radioactive)
- Review procedures for use of compressed gas cylinders
- Protective Apparel and Equipment
  - Discuss when safety glasses, goggles, or face shields are required.
  - Discuss any need for other protective equipment.
  - Discuss selection of gloves.

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- Housekeeping, Maintenance, and Inspections
  - Discuss materials stored or frequently present on the floor.
  - Discuss maintenance items for scientific equipment.
  - Discuss formal and internal inspection programs.
  
- Exposure Monitoring
  - Discuss PEL and TLV for chemicals in use and how to reduce employee exposure.
  - Discuss building ventilation.
  - Discuss use of fume hoods, biological safety cabinets or other mechanical ventilation systems.
  
- Review SOP for working with Biologically Hazardous Materials
  - Review Exposure Control Plan if working with human blood or other potentially infectious materials.
  - Discuss Biosafety Requirements if working with recombinant DNA or infectious agents.
  - Review Hepatitis B Vaccination Program.
  - Review PPE, Housekeeping and Waste Disposal Procedures.
  
- Working with Radioisotopes
  - Review Radiological Safety Practices.
  - Review Dosimetry Program.
  
- Medical Program
  - Review criteria for medical surveillance.
  
- Training Program
  - Discuss Unit-Specific, EHS, and other training sessions.
  
- Additional Safety Session Topics
  - Review recent incidents/accidents/injuries and how to prevent recurrence.
  - Review new equipment at least annually.
  - Review new procedures at least annually
  - Review results of recent inspections and how to correct problem areas.









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**WSU Laboratory Safety Inspection Form**

Location:		Today's Date:	
PI Name:		Inspector Name:	
Supervisor Name:		Inspector Title:	
Department:		Department:	
Phone/E-mail:		Phone/E-mail:	

Refer to the **Instructions for the Laboratory Safety Inspection Form** for a more detailed description as to what to look for when checking each item.

S=Satisfactory

U=Unsatisfactory

N=Not Applicable

**GENERAL SAFETY**

**COMMENTS**

**Door Signs**

		S	U	N	
1	Key lab personnel are identified.				
2	Hazard information sections are completed.				
3	Information is current and applicable to the lab.				

**Housekeeping**

4	Lab door is able to be secured.				
5	View through door's window is unobstructed.				
6	Aisles and exits are unobstructed.				
7	Work areas are uncluttered.				
8	Storage areas are uncluttered.				
9	Ceiling tiles are in place.				

**Equipment**

10	Equipment manuals are available.				
11	Equipment is unobstructed.				
12	Guards are in place.				
13	Equipment is secured or on a stable surface.				
14	Auto shut-offs are on equipment.				

**ELECTRICAL SAFETY**

15	Emergency cut-off switches are accessible.				
16	Electrical panels are accessible.				

**Electrical Outlets**

17	Outlets are not overloaded.				
18	GFCI outlets are present.				

**Electrical Cords**

19	Electrical cords are clear of aisles, sinks and heat sources.				
20	Electrical cords are in good condition.				

**Extension Cords**

21	Extension cords are used temporarily (less than 90 days).				
22	Extension cords are of 3-wire design, with ground plug intact.				

**EMERGENCY EQUIPMENT**

23	Emergency contact information is posted by the telephone.				
24	Fire alarm pull stations are unobstructed.				
25	Stocked first aid kit is available.				
26	Stocked spill clean-up kit is available.				

**EMERGENCY EQUIPMENT continued**

**Fire Extinguishers**

27	Extinguishers are correct type for the hazards present.				
28	Extinguishers are mounted to the wall or in extinguisher cabinet.				

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29	Extinguishers are unobstructed.				
30	Pressure gauges are in the green.				
31	Extinguisher has not been used.				
32	Extinguisher is not damaged or corroded.				
33	Extinguisher has been tagged within the last year.				
34	Extinguisher has been inspected within the last month.				
<b>Safety Shower and Eyewash</b>					
35	Safety Shower/Eyewash is unobstructed.				
36	Safety Shower/Eyewash location identified by a highly visible sign.				
37	Safety Shower/Eyewash is tested regularly.				
<b>CHEMICAL SAFETY</b>					
38	Spark producing equipment is kept away from flammables.				
39	No evidence of eating or drinking is in the lab.				
40	House vacuum is protected by traps/filters.				
<b>Chemical Hygiene Plan (CHP)</b>					
41	Current CHP is available.				
42	Lab-specific safety information is included.				
43	Lab personnel are trained on the CHP.				
44	Safety Data Sheets are available.				
45	Chemical inventory is current and available.				
<b>Personal Protective Equipment</b>					
46	Eye/face protection is worn while in the lab.				
47	Labcoats or aprons are worn.				
48	Appropriate gloves are worn.				
49	Respirator wearers have received approval, training and fit-testing.				
<b>Chemical Storage</b>					
50	Chemicals are stored per compatibility.				
51	Chemicals are stored in cabinets or stable shelving.				
52	Chemicals are stored in proper containers.				
<b>Chemical Containers</b>					
53	Containers are in good condition.				
54	Containers are properly labeled.				
55	Containers are closed when not in use.				
56	Secondary containment is used.				
<b>Gas Cylinders</b>					
57	Gas cylinders are securely fastened to prevent tipping.				
<b>Peroxidizable Chemicals</b>					
58	Peroxidizables are dated when opened.				
59	Peroxidizables are tested for peroxides every six months.				
<b>CHEMICAL SAFETY continued</b>					
<b>Peroxidizable Chemicals</b>					
60	Refrigerator is explosion-proof/-protected.				
61	Flammable cabinets are used.				
62	NFPA Maximum allowable storage volumes are not exceeded.				
<b>Mercury Devices</b>					
63	Mercury-containing devices have been replaced or removed.				
64	No mercury thermometers are used in ovens.				
<b>Chemical Fume Hoods</b>					
65	Chemical fume hoods have been inspected within the last year				
66	Air flow into the hood is unobstructed.				

<b>BIOLOGICAL SAFETY</b>				
1	Functional sink is in laboratory space.			
2	Exterior windows are sealed shut, or have fly screens present.			
3	Bio-safety cabinet(s) have been certified within the last year.			
4	Lab space can be easily decontaminated.			
5	Appropriate disinfectant for material is in lab.			
<b>Bench Tops</b>				
6	Bench tops are made of an impervious material.			
7	Bench tops are resistant to chemicals and moderate heat.			
<b>Laboratory Furniture</b>				
8	Furniture is appropriately sturdy.			
9	Furniture can be easily decontaminated.			
<b>Biohazard Waste Containers</b>				
10	Containers are able to be closed.			
11	Containers display the biohazard symbol.			
12	Containers are appropriate for transport to autoclave.			
13	Containers are closed when not in use.			
14	Sharps Disposal Containers are present.			
<b>RADIATION SAFETY</b>				
1	Weekly contamination surveys are conducted.			
2	All areas/containers with radioactive materials are identified with signs/labels.			
3	Equipment for detecting radiation hazards is readily available.			
4	Material is secured when unattended.			
<b>Radioactive Materials Recordkeeping</b>				
5	Inventory of the lab's radioisotopes is available.			
6	Records of quantities used are available.			
7	Records of liquid wastes disposed of via the sanitary sewer are available.			
<b>Radioactive Waste Containers</b>				
8	Waste container is of appropriate material.			
9	Wastes are segregated per half-life.			
10	Waste container is properly labeled.			
11	Waste container is properly labeled.			
<b>Containment and Shielding</b>				
12	Workspace is lined with absorbent paper.			
13	Shielding is used for highly radioactive materials.			
14	Tools are used for highly radioactive materials.			
<b>Lasers</b>				
15	Class IIIB or IV lasers are registered.			

## **Instructions for the Laboratory Safety Inspection Form**

The following briefly describes what Environmental Health & Safety (EHS) looks for during a typical laboratory inspection (for general laboratory safety and chemical safety – biological and radiation safety issues are only briefly addressed). The categories follow the form point by point.

### **General Safety**

#### **Door Signs**

Emergency responders (e.g., Fire Department, Paramedics, Police) need information on the hazards present before entering a room. EHS recommends the officially approved signs for posting laboratory contact information and listing special hazards. (Contact EHS to request additional information at 978-3347 or 978-5424). The sign should be posted either next to or on the door, or taped to the door in a way that it is visible to emergency personnel.

1. Key lab personnel are identified.  
The names and phone numbers (office and home) of the principal investigator and other knowledgeable employees/students should be listed on or beside the door.
2. Hazard information sections are completed.  
The appropriate hazard information should be on the sign.
3. The information is current and applicable to the lab.  
All door signs should be checked for accuracy at least annually. Additionally, the information should be updated whenever the contact or hazard information changes. Door signs should be dated when posted or updated, or at the time of the annual check.

#### **Housekeeping**

4. Lab door is able to be secured.  
All doors that enter from the public areas of the building should be able to be locked to secure the laboratory.
5. View through door's window is unobstructed.  
If the laboratory door is outfitted with a window, it needs to remain unobstructed for emergency responders to view the laboratory prior to entry.
6. Aisles and exits are unobstructed.  
There should be no objects that block movement through aisles or exits. Emergency personnel should be able to access all areas of the laboratory through all exit doors, and should be able to move freely in the aisles when smoke may be present.
7. Work areas are uncluttered.  
Floor space and bench space should not be cluttered with excessive storage. Physical hazards should be minimized (e.g., tripping hazards, items that could fall on someone, etc.), and combustible/flammable materials should not be stored in excessive amounts.
8. Storage areas are uncluttered.  
Materials should be stored in such a way that they will not accidentally slide, collapse, fall, or spill.
9. Ceiling tiles are in place.  
Ceiling tiles should be kept intact and in place as part of the ventilation scheme of the room.

#### **Equipment**

10. Equipment manuals are available.  
Safe operating instructions (usually from the manufacturer) should be available as part of the Specific Operating Procedures required by the WSU Laboratory Management Plan.
11. Equipment is unobstructed.  
Clutter should be limited to keep equipment readily accessible and operable.

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## 12. Guards are in place.

The Point-of-Operation of any piece of equipment must have a guard. Examples include:

### $\frac{3}{4}$ Nip or Pinch Points

- between two rotating parts;
- between a rotating part and a stationary part;
- or between a rotating part and longitudinal motion

### $\frac{3}{4}$ Hazardous projections on rotating parts

### $\frac{3}{4}$ Hazardous reciprocating motion

Belt-driven equipment should have a guard in place, completely covering the belt and pulley.

## 13. Equipment is secured or on a stable surface.

Equipment should be set up or stored in such a way that it will not accidentally fall or tip over.

## 14. Auto shut-offs are on equipment.

Any equipment that is used when unattended should have an automatic shut-off to prevent situations that might result in fire or other emergencies. An example is a heating bath over-temperature shut-off (for when the water completely evaporates).

## **Electrical Safety**

### 15. Emergency cut-off switches are accessible.

Access to cut-off switches should not be obstructed. Three-foot clearances should be maintained around all emergency pull switches. Striped tape applied to the floor is recommended to visually mark the clearance area.

### 16. Electrical panels are accessible.

Access to electrical panels should not be obstructed. Three-foot clearances should be maintained around all circuit panel boxes. Striped tape applied to the floor is recommended to visually mark the clearance area.

## **Electrical Outlets**

### 17. Outlets are not overloaded.

Electrical circuits should not be overloaded. "Overloaded" is defined as excessive electrical cords plugged into a circuit through the use of adapters, which allow multiple plug capability. Powerstrips with circuit breakers can be used, but should not be used in a series or with adapters. Three-to-two-prong adapters should never be used to plug a three-wire plug into a two-wire system.

### 18. GFCI outlets are present.

Ground Fault Circuit Interrupter (GFCI) protection must be used for electrical appliances that will be operated within six feet of water.

## **Electrical Cords**

### 19. Electrical cords are clear of aisles, sinks and heat sources.

### 20. Electrical cords are in good condition.

Cords should be inspected for any damage. Cords with damage to the insulation (i.e., wires are visible or tape is needed to hold it together) or frayed cords should be replaced immediately. Equipment with cords that have obvious shorts should also be taken out of service until the cords are replaced.

## **Extension Cords**

### 21. Extension cords are used temporarily (less than 90 days).

Electrical equipment should be located so that extension cords are not needed on a permanent basis or an outlet should be installed close to the equipment. Power strips with circuit breakers are acceptable to use, but should not be connected in a series or to an extension cord.

### 22. Extension cords are of 3-wire design, with the ground plug intact.

All extension cords must be properly grounded three-wire cords. This includes having the ground plug intact.

## **Emergency/Safety Equipment**

23. Emergency contact information is posted by the telephone.  
Emergency phone numbers (including 911) should be posted by or on all phones in the laboratory.
24. Fire alarm pull stations are unobstructed.
25. Stocked first aid kit is available.  
The first aid kit should be available and unobstructed. Consider the various injuries that could happen in the laboratory, and assemble the first aid kit accordingly. For example, if hydrofluoric acid is used in the laboratory, then calcium gluconate gel should be available for the first aid treatment of skin exposure to hydrofluoric acid. Personnel should be trained on the proper use of the kit's contents. Periodically check expirations on any ointments or over-the-counter pharmaceuticals. Periodically evaluate the hazards present in the laboratory, and adjust the first aid kit contents as needed.
26. Stocked spill clean-up kit is available.  
A spill clean-up kit should be available and unobstructed. Consider the spills that could happen in the laboratory, and assemble the spill clean-up kit accordingly. Materials should be evaluated for compatibility with the hazards in the laboratory that could be spilled. Universal sorbents, such as 3M Powersorb, and spill pads are recommended for spill kits. If any materials are used, they should be re-stocked immediately. Periodically evaluate the spill clean-up kit, and adjust the kit contents as needed.

## **Fire Extinguishers**

27. Extinguishers are correct type for the hazards present.  
In general, fire extinguishers suitable for the hazard to be protected should be available. There are five types of fires:
  - $\frac{3}{4}$  Class A: Ordinary combustibles such as wood, paper, cloth, trash and plastics.
  - $\frac{3}{4}$  Class B: Fires in flammable liquids (such as gasoline, petroleum and paint) and flammable gases (propane, butane, etc.).
  - $\frac{3}{4}$  Class C: Energized electrical equipment, such as motors, transformers and appliances.
  - $\frac{3}{4}$  Class D: Combustible metals, such as potassium, sodium, aluminum and magnesium.
  - $\frac{3}{4}$  Class K: Cooking oil fires.Most labs should have an ABC type of extinguisher, as they work on the most common types of fires. If there are Class D or K fire hazards, appropriate extinguishers should also be present. For additional information contact Fire Safety at 978-5803 or 978-5531.
28. Extinguishers are mounted to the wall or in extinguisher cabinet.  
Fire extinguishers should be mounted on the wall, or in an extinguisher cabinet, not sitting on the floor.
29. Extinguishers are unobstructed.  
Fire extinguishers should be in an obvious and accessible location near the exit door and/or near the hazard.
30. Pressure gauges are in the green.  
Check indicators (if present) on fire extinguishers to be sure that the pressure gauge is in the normal range. If the indicator is not in the normal range, the extinguisher needs to be serviced through Fire Safety at 978-5803 or 978-5531.
31. Extinguisher has not been used.  
Make sure the pin is in place on the extinguisher handle and the tie unbroken. If there is any indication of usage, the extinguisher needs to be serviced through Fire Safety at 978-5803 or 978-5531.
32. Extinguisher is not damaged or corroded.  
Confirm that seals or tamper indicators are intact. Check that extinguisher operating instructions are legible and face outward. Note any obvious physical damage. Confirm that the Hazardous Material Identification System label is in place.
33. Extinguisher has been tagged in the last year.



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The fire extinguisher should be tagged with an inspection date within the last year.

34. Extinguisher has been inspected within the last month.

Visual inspections of each fire extinguisher should be performed every month using the above points. The inspection should be noted on the back of the annual inspection tag.

### **Safety Shower and Eyewash**

Safety showers should be available in labs where there is the potential hazard of injury to the skin due to contact with a corrosive, severely irritating or toxic chemical. Eye washes should be available in labs where there is the potential hazard of injury to the eye due to contact with a chemical or where they are exposed to biological materials that are Risk Group 2 or greater.

35. Safety Shower/Eyewash is unobstructed.

Safety showers and eye washes should be in accessible, unobstructed locations that require no more than 10 seconds to reach.

36. Safety Shower/Eyewash location is identified by a highly visible sign.

Safety shower and eye wash locations should be identified with a highly visible sign that is visible within the area served by the safety shower and/or eye wash.

37. Safety Shower/Eyewash is tested regularly.

Safety showers should be activated and tested at least annually. Eye washes should be activated and tested weekly. These equipment inspections should be recorded on tags, initialed and dated after performing the inspection.

## **Chemical Safety**

38. Spark producing equipment is kept away from flammables.

Spark producing equipment, such as Variacs or Rheostats, should not be located in an area where flammable gases or liquids are stored or used (e.g., laboratory chemical hoods).

39. No Food & Drink in lab

Food and beverages are forbidden in laboratories. Food and beverages must not be stored in refrigerators that also store biological, chemical or radioactive materials.

40. House Vacuum – protected from vapors

No liquids should be aspirated directly into the house vacuum lines. If laboratory personnel from different laboratories aspirate incompatible chemicals through the vacuum lines, those chemicals can violently react with each other. Additionally, vacuum lines can become blocked and vacuum pump oil can become contaminated and degraded, resulting in damage to the system.

### **Chemical Hygiene Plan (CHP)**

41. Current CHP is available.

A current copy of the laboratory's CHP should be available to all laboratory personnel.

42. Lab-specific safety information is included.

The CHP should identify all the hazards present in that laboratory and describe specific measures for effectively controlling those hazards. The laboratory's CHP is usually presented as general safety information.

All laboratory personnel should know the location of the CHP and be familiar with its contents.

43. Safety Data Sheets are available.

Laboratory personnel should know how to obtain a Safety Data Sheet (SDS) for any given chemical in the laboratory (this is a required part of the CHP). SDSs should accompany all purchased chemicals, should be retained upon receipt, and should be immediately available from a vendor. Assistance with obtaining SDSs can be obtained by contacting EHS.

44. Chemical inventory available

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Without a chemical inventory, it is difficult to support the claim that all the hazards in a laboratory have been identified. A chemical inventory helps keep chemical quantities low and helps prevent over-purchasing. In addition, inventories can sometimes be useful in responding to an incident in the laboratory.

### **Personal Protective Equipment**

45. Eye/face protection is worn while in lab.

Anyone in a laboratory should be wearing appropriate eye/face protection. At a minimum, this means safety glasses with side shields (ANSI Z-87). Chemical goggles are recommended if there is a splash/spray hazard.

46. Lab coats or aprons are worn.

Laboratory coats or aprons should be worn to prevent chemical, radioactive or biological materials from coming into contact with the skin or clothing. Any protective clothing worn should never be taken home to wash. Each department should have a laundry facility on site to clean/decontaminate any protective clothing that cannot be discarded. In the case where a department does not have a laundry facility, arrangements should be made with another department or a professional launderer.

47. Appropriate gloves are worn.

For use with chemicals: Various types of gloves are required for various chemicals. Latex gloves are not a good choice for all-purpose chemical protection. Nitrile gloves are adequate for many chemicals, but the laboratory should have a glove chart for quick reference. If unsure which gloves to use, consult a glove chart such as the one located in the stock room or check with a glove manufacturer. Disposable gloves should not be reused. Reusable gloves should be checked routinely for holes/leaks.

For use with biological materials: Single-use disposable laboratory gloves are generally adequate. Because of potential allergic reactions, alternatives to latex gloves should be provided. Nitrile gloves are recommended. If reusable gloves are used, they must be decontaminated after each use.

48. Respirator wearers have received approval, training and fit-testing.

If personnel use respirators, they are required by law to be medically evaluated, fit tested and trained prior to use. Contact EHS for more information.

### **Chemical Storage**

49. Chemicals are stored per compatibility.

Incompatible chemicals give an undesired chemical reaction when mixed. This usually refers to substances that will react to cause an imminent threat to health and safety through an explosion, fire, and/or formation of toxic materials. Generally speaking, segregate acids and bases; acids from cyanides and sulfides; flammables from strong corrosives and oxidizers. For more information refer to the SDS's for the chemicals or contact EHS for chemical storage guidance.

50. Chemicals are stored in cabinets or on stable shelving.

Chemicals should be stored in cabinets or on stable shelving. Chemicals should not be stored on the floor or precariously on shelves where they could be knocked off or fall off.

51. Chemicals are stored in proper containers.

Container material must be appropriate for the chemical contents. Hydrofluoric acid should never be stored in glass. Nitric acid and other oxidizers should only be stored in glass. Food containers are never to be used for chemical storage, even if the label has been removed.

### **Chemical Containers**

52. Containers are in good condition.

All chemical containers should be in good condition with no cracks or leaks, and with the appropriate lid/cap. Any container that is not in good condition should be replaced immediately.

53. Containers are properly labeled.

All containers of chemical, biological, and radioactive materials must be labeled as to the contents and its hazard category (refer to a chemical compatibility chart). Even temporary containers should be labeled so that if an

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emergency arises, another person can identify what is in the container. For chemical waste, the container should describe the contents with the word "waste" (e.g., "waste acetone," "waste halogenated solvents," etc.) and any waste that is hazardous must have the words "Hazardous Waste" on the container.

### 54. Containers are closed when not in use.

All chemicals and chemical waste should be stored in containers that are able to be closed. Chemical containers (including chemical waste containers) are to be closed at all times unless in immediate use. Immediate use means that a person is in the vicinity of the container and is actively adding or removing chemicals from the container.

### 55. Secondary containment is used.

If bottles must be stored on the floor, they must be in a secondary container such as a sturdy plastic tub that minimizes accidental breakage. The secondary container should be able to contain the bottle and contents if breakage should occur.

## **Gas Cylinders**

### 56. Gas Cylinders are securely fastened to prevent tipping.

Gas cylinders should be secured to a wall or bench, or chained to a cart, to prevent tipping.

## **Peroxidizable Chemicals**

### 57. Peroxidizable chemicals are dated when opened.

Peroxidizable chemicals react with air to form shock-sensitive, explosive peroxides. They must be dated when opened.

### 58. Peroxidizable chemicals are tested for peroxides every six months

Once opened, peroxidizable chemicals should be tested every six months for the presence of peroxides. Peroxidizable chemicals should be disposed of if no longer needed or if they have formed peroxides. For more information on peroxidizable chemicals see Safety in Academic Chemistry Laboratories or contact EHS.

## **Flammable Liquid Storage**

### 59. Refrigerator is explosion-proof/-protected.

Flammable materials that must be kept in a refrigerator must be stored in one designed or modified for flammable storage or one that is explosion-proof. Standard household refrigerators have exposed ignition sources, making the refrigerator unsuitable for flammable material storage.

### 60. Flammable cabinets are used.

If large amounts (gallon quantities) of flammable or combustible liquid are kept in a laboratory, flammable cabinets may be required. Consult with EHS and Fire Safety for more information.

### 61. NFPA maximum allowable storage volumes are not exceeded.

The National Fire Protection Association (NFPA) has set limits on flammable liquids stored in laboratories. Maximum quantities for flammable liquid storage are determined based on the type of laboratory inspected, the hazard classification of the flammable liquid, the container used for storage, and the fire protection features of the laboratory.

## **Mercury Devices**

62. Contact the EHS for details on how to reduce the amount of mercury present in the laboratory.

63. No mercury thermometers should be used in ovens. Mercury thermometers should not be used in heated ovens.

Broken thermometers in ovens pose a health hazard because heated mercury will volatilize such that it can be breathed in. This will also contaminate the oven, requiring its removal and disposal. Disposing of mercury-contaminated items is very expensive.

## **Chemical Fume Hoods**

64. Chemical fume hoods will be inspected annually by EHS. Any fume hood found not in proper operating condition will be reported to Physical Plant. The PI or instructor of the laboratory where a non-operational hood is located will be

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notified. That individual should also report the discrepancy to the Physical Plant. At any time a malfunctioning hood is identified it should be immediately reported to Physical Plant.

65. Air flow into the hood is unobstructed.

Excess chemicals and/or equipment should not be stored in the hood, especially if it blocks proper air flow (i.e., blocks the slots between the back baffles). Large items that must be in a hood should be elevated approximately two inches on blocks or on a stand with legs to allow air flow beneath the item into the back bottom slot of the hood interior.

### **Biological Safety**

1. Functional sink is in laboratory space.

Laboratories should have a sink for handwashing. The sink should be kept stocked with soap and paper towels. A handwashing policy should be communicated to all laboratory members, which directs staff and students to wash their hands after they handle viable materials, after removing gloves, and before leaving the laboratory.

2. Exterior windows are sealed shut, or have fly screens present.

If installing screens is not an option, windows should be sealed shut.

3. Biological Safety Cabinet(s) have been certified within the last year.

A sticker that lists the last certification date should be present on the cabinet. It is required that a BSC be certified at the time of installation, annually thereafter, and any time the unit is relocated.

4. Lab space can be easily decontaminated.

Spaces between benches, cabinets, and equipment should be readily accessible for cleaning. Carpets and rugs are prohibited because they are difficult to decontaminate.

5. Appropriate disinfectant for material is in lab.

Work surfaces should be decontaminated on completion of work, at the end of the day, and after any spill or splash of viable material with disinfectants that are effective against the agents of concern. For most organisms, a 10% bleach solution is effective. However, for some organisms, 70% ethanol may be required. Remember that bleach solutions should be prepared fresh each day.

### **Bench Tops**

6. Bench tops are made of an impervious material.

Self-explanatory (to allow for easy decontamination).

7. Bench tops are resistant to chemicals and moderate heat.

Bench tops should be resistant to acids, alkalis, organic solvents and moderate heat, any of which may contact the bench top during normal usage or during decontamination.

### **Laboratory Furniture**

8. Furniture is appropriately sturdy.

Laboratory furniture should be sturdy, in good condition, and capable of supporting anticipated loading and uses.

9. Furniture can be easily decontaminated.

Laboratory furniture should be easy to decontaminate. Accordingly, cloth-covered chairs are prohibited. Vinyl-covered chairs are acceptable.

### **Biohazard Waste Containers**

10. Containers are able to be closed.

All containers and bags used for waste collection should be able to be closed. If a waste collection bag is kept in a container, the container should have a lid.

11. Containers are closed when not in use.

When not in use, biohazard waste containers should be kept closed.

12. Containers display the biohazard symbol.

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All containers and bags used for waste collection should prominently display the international biohazard symbol. All bags used for waste collection must have the biohazard symbol printed on the bag. If the bag is kept in a container, the container should also have the biohazard symbol prominently displayed.

13. Containers are appropriate for transport to autoclave.

Durable, leak-proof containers should be available to transport waste to the autoclave for decontamination.

Secondary containment for autoclave bags helps prevent spills of material from unexpected holes or tears in the bag. Appropriate containers for transport include plastic or metal tubs. Do not place transport containers in the autoclave unless you are certain they are composed of "autoclavable" material. If bags are heavy, use a cart for transporting.

14. Sharps Disposal Containers are present.

Sharps disposal containers should be present for the proper disposal of laboratory sharps. Containers come in three sizes: 1-quart, 2-gallon, and 8-gallon. EHS provides pick-up of full containers for disposal.

### **Radiation Safety**

1. Weekly contamination surveys are conducted.

Laboratories must perform and document surveys for radioactive contamination at least monthly and whenever quantities exceed thresholds specified in the laboratory's Radiation Permit.

2. All areas/containers with radioactive materials are identified with signs/labels.

3. Equipment for detecting radiation hazards is readily available.

4. Material is secured when unattended.

Radioactive material must be attended by trained personnel or secured from removal when not attended.

### **Radioactive Materials Recordkeeping**

Laboratories must maintain records of the radioactive materials they possess and use, including records of liquid wastes disposed through the sanitary sewer.

5. Inventory of the lab's radioisotopes is available.

6. Records of quantities used are available.

7. Records of liquid waste disposed of via the sanitary sewer are available.

### **Radioactive Waste Containers**

Waste must be collected in appropriate receptacles and segregated according to half-life. Waste receptacles must be properly labeled and the contents of each waste parcel must be recorded.

8. Waste container is of appropriate material.

9. Wastes are segregated per half-life.

10. Waste container is properly labeled.

11. Contents of the waste container are recorded.

### **Containment and Shielding**

12. Workspace is lined with absorbent paper.

Benches, fume hoods, etc., where loose radioactive materials are used must be lined with absorbent paper.

13. Shielding is used for highly radioactive materials.

Sources with high levels of external exposure should be used and stored behind shielding to minimize exposures.

14. Tools are used for highly radioactive materials.

Sources with high levels of external exposure should be handled with appropriate tools to minimize exposures.

### **Lasers**

15. Class IIIB or IV lasers are registered.











**Section 13 – Biological Hazards**

Biological hazards are subject to additional regulatory requirements, including recordkeeping. Various types of records, such as a list of potentially exposed personnel, any procedures involving biohazardous materials or waste, and other documents should be maintained in this section, or referenced otherwise. If there is any question concerning the use of Select Agents, **Prior to use, clearance must be documented and signed by the Bio-Safety Officer.** If there are any questions they should be directed to the Bio-Safety Officer in EHS. If laboratory procedures involve the use of human derived products covered under the Bloodborne Pathogen Standard, reference the Exposure Control Plan here.

*If applicable, please complete*

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**Section 16 – Personal Protective Equipment (PPE) Assessment**

Job Title: \_\_\_\_\_ Date: \_\_\_\_\_ Department:

Supervisor: \_\_\_\_\_ Location: \_\_\_\_\_ Analysis

By: \_\_\_\_\_ Employee Name(s): \_\_\_\_\_ Signature:

<b>Tasks</b>	<b>Potential Hazard</b>	<b>PPE Recommended</b>

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Job Title	Student/Laboratory Worker	Date	Current
Department	All	Supervisor	
Location	Research/Teaching Labs	Analysis by	
Employee Name(s)	All	Signature	

Tasks	Potential Hazard	PPE Recommended
Working with small volumes of corrosive liquids < 1 liter	Skin and eye damage	Safety glasses, goggles (if splash hazard), Light chemical resistant gloves, Lab coat, closed shoe
Working with large volumes of corrosive liquids > 1 liter, acutely toxic corrosives or work which may create a splash hazard	Large surface area skin and eye damage, poisoning, or great potential for eye and skin damage.	Safety goggles & face shield Appropriate heavy resistant gloves Clothing above and chemical resistant apron
Working with small volumes of organic solvents < 1 liter	Skin and eye damage Slight poisoning potential through skin absorption	Safety glasses, goggles (if splash hazard), Light chemical resistant gloves, Lab coat, closed shoe
Working with large volumes of organic solvents > 1 liter, very dangerous organic solvents or work which may create a splash hazard	Major skin and eye damage, poisoning through skin absorption	Safety goggles & face shield Appropriate heavy resistant gloves Above clothes and chemical resistant apron

**NOTE:** Please reference the specific glove manufacturer's selection chart for proper selection of all gloves based on the specific hazard.

## Wichita State University

Job Title                      Student/Laboratory Worker    Date                      Current  
 Department                  All    Supervisor  
 Location                      Research/Teaching Labs        Analysis by  
 Employee Name(s)        All    Signature

<b>Tasks</b>	<b>Potential Hazard</b>	<b>PPE Recommended</b>
Working with small volumes of human blood, body fluids or other Bloodborne Pathogens (BBP)	Potentially infectious disease (BBP) Potential spread of infectious disease	Safety glasses, latex gloves Lab coat, closed shoe
Working with large volumes of human blood, body fluids or other Bloodborne Pathogens (BBP) and/or splash hazards	Increased potential of becoming infected with infectious disease (BBP) Increased potential spread of infectious disease	Safety goggles & face shield Latex gloves Lab coat, closed shoe coveralls and foot covers may be necessary
Working with hazardous powders	Potential skin and eye damage, Potential for poisoning through skin absorption	Safety glasses Goggles for large quantities Chemical resistant gloves Lab coat, closed shoe
Working with acutely toxic hazardous powders	Great potential skin and eye damage Great potential for poisoning through skin absorption	Safety goggles Appropriate heavy resistant gloves Lab coat, closed shoe Coveralls and booties if necessary
Working with radioactive materials	Potential cell damage. Potential spread of radioactive materials	Safety glasses, goggles splash hazard Latex gloves Lab coat, closed shoe
Working with radioactive chemicals (corrosives, solvents, powders, etc.)	See appropriate chemical section above Potential cell damage. Potential spread of radioactive materials	Safety glasses, goggles splash hazard Chemical resistant gloves Lab coat, closed shoe Use PPE for applicable tasks above
Working with radioactive human blood, body fluids or other BBPs	Potential cell damage Potential spread of radioactive materials Potential BBP exposure	Safety glasses, goggles splash hazard Latex gloves Lab coat, closed shoe

NOTE: Please reference the specific glove manufacturer's selection chart for proper selection of all gloves based on the specific hazard.

## Wichita State University

Job Title                      Student/Laboratory Worker    Date                      Current  
 Department                  All    Supervisor  
 Location                      Research/Teaching Labs        Analysis by  
 Employee Name(s)        All    Signature

<b>Tasks</b>	<b>Potential Hazard</b>	<b>PPE Recommended</b>
Working with cryogenic liquids	Major skin, tissue and eye damage	Safety glasses or goggles for large volumes or splash hazards Heavy insulated gloves Lab coat, closed shoe
Working with very cold materials and equipment (freezers, dry ice)	Skin damage	Safety glasses Insulated gloves Lab coat, closed shoe
Working in cold environments (walk-in cold rooms or freezers)	Frostbite (skin damage) Hypothermia	Safety glasses Insulated gloves and warm clothing Lab coat, closed shoe
Working with hot liquids, equipment and/or open flames (autoclave, Bunsen burner, waterbath, oil bath)	Skin damage Eye damage	Safety glasses or goggles for large volumes or splash hazards Insulated gloves Lab coat, closed shoe
Working with large volumes of hot, cold, or cryogenic liquids	Major skin and eye damage Frozen or burned body tissues	Safety glasses or goggles and face shield Heavy insulated gloves Above clothes and apron or coveralls
Working with Ultraviolet Radiation	Conjunctivitis Corneal eye damage Erythema	UV face shield and goggles Lab coat, closed shoe
Working with LASER radiation	Retinal eye damage Skin damage	Appropriate shaded goggles with optical density based on individual beam parameters Lab coat, closed shoe No jewelry/reflective items allowed

NOTE: Please reference the specific glove manufacturer's selection chart for proper selection of all gloves based on the specific hazard.