Laboratory Safety

Hazard Assessment Tool for Personal Protective Equipment Use

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This form must be completed by the PI or their designee. The form is designed to conduct a laboratory hazard assessment specific to activities in each laboratory. The laboratory hazard assessment identifies hazards to lab workers and specifies personal protective equipment (PPE) to protect lab workers during work activities. The person conducting the assessment must verify that it is complete and that training has been conducted.

This assessment consists of four sections:

Section 1: Laboratory Information
Section 2: Laboratory Hazard Assessment and PPE
Section 3: Conduct laboratory specific PPE Training
Section 4: Verification of PPE Training

The Laboratory Safety Coordinator is available to assist you with completing this form or with reviewing it after you have completed it. **Keep completed assessment and verification of training with other safety information in lab and send a copy to the Laboratory Safety Coordinator.**

Section 1: Laboratory Information

Department	
Laboratory location	
Principal Investigator	
Name & title of person conducting assessment	
Phone number	
Email address	
Date assessment completed	
Signature	

Section 2: Laboratory Hazard Assessment and PPE

In this section, you will:

- Conduct a hazard assessment of the laboratory to identify activities when PPE is needed to protect the laboratory staff from exposure to hazards.
- Certify the hazard assessment for the laboratory by signing in Section 1.

The following checklists are an overview of common lab activities and associated potential hazards and applicable PPE. Additional PPE may be used depending on the individual laboratory procedures. Check each box that describes activities performed by lab personnel.

Mark if applies	Chemical Hazards		
Yes	**Activity**	**Potential Hazard**	**Applicable PPE**[1, 2]
	Working with small volumes (<4 liters) of corrosive liquids.	Eye or skin damage.	Safety glasses or goggles. Chemical-resistant gloves. Lab coat.
	Working with large volumes (>4 liters) of corrosive liquids, small to large volumes of acutely toxic corrosives, or work which creates a splash hazard.[3, 4]	Poisoning, increased potential for eye and skin damage.	Safety goggles. Elbow-length chemical-resistant gloves. Lab coat and chemical-resistant apron.
	Working with small volumes (<4 liters) of organic solvents or flammable organic compounds.	Skin or eye damage, potential poisoning through skin contact.	Safety glasses or goggles. Chemical-resistant gloves. Lab coat.
	Working with large volumes (>4 liters) of organic solvents, small to large volumes of very dangerous solvents, or work which creates a splash hazard.[3, 4]	Major skin or eye damage, potential poisoning through skin contact. Fire.	Safety goggles. Chemical-resistant gloves. Flame-resistant lab coat (e.g. Nomex).
	Working with toxic or hazardous chemicals (solid, liquid, or gas).[3, 4, 5]	Skin or eye damage, potential poisoning through skin contact.	Safety glasses (goggles for large quantities). Light chemical-resistant gloves. Lab coat.
	Working with highly toxic or hazardous chemicals (solid, liquid, or gas).[3, 4, 5, 6, 7]	Increased potential for eye or skin damage, increased potential poisoning through skin contact.	Safety goggles. Chemical-resistant gloves. Lab coat.
	Working with an apparatus with contents under pressure or vacuum.	Eye or skin damage.	Safety glasses or goggles, face shield for high risk activities. Chemical-resistant gloves. Lab coat, chemical-resistant apron for high risk activities.
	Working with air or water reactive chemicals.	Severe skin and eye damage. Fire.	Work in inert atmosphere, when possible. Safety glasses or goggles. Chemical-resistant gloves. Lab coat, flame resistant lab coat for high risk activities (e.g. Nomex). Chemical-resistant apron for high risk activities.
	Working with potentially explosive chemicals.	Splash, detonation, flying debris, skin and eye damage. Fire.	Safety glasses or goggles, face shield, and blast shield. Heavy gloves. Flame-resistant lab coat (e.g. Nomex).
	Working with low and high temperatures.	Burns, splashes. Fire.	Safety glasses or goggles where work creates a splash hazard. Lab coat. Thermal insulated gloves, when needed.
	Minor chemical spill cleanup.	Skin or eye damage, respiratory damage.	Safety glasses or goggles. Chemical-resistant gloves. Lab coat. Chemical-resistant apron and boot/shoe covers for high risk activities. Respirator as needed. Consider keeping Silver Shield gloves in the lab spill kit.

Mark if applies	Biological Hazards		
Yes	**Activity**	**Potential Hazard**	**Applicable PPE[1, 2]**
	Working with human blood, body fluids, tissues, or blood borne pathogens (BBP).[8]	Exposure to infectious material.	Face shield, or facemask with goggles, latex or nitrile gloves, lab coat or gown.
	Working with animal and/or human specimens.	Exposure to infectious material or preservatives.	Safety glasses or goggles, protective gloves such as light latex or nitrile for unpreserved specimens (select protective glove for preserved specimens according to preservative used), lab coat or gown.
	Working with agents or recombinant DNA classified as Biosafety Level 1 (BSL-1).	Eye or skin irritation.	Safety glasses or goggles for protection from splash or other eye hazard, light latex or nitrile gloves for broken skin or skin rash, lab coat or gown.
	Manipulation of cell lines, viruses, bacteria, or other organisms classified as Biosafety Level 2 (BSL-2). [8]	Exposure to infectious material, particularly through broken skin or mucous membranes.	Safety glasses or goggles for protection from splash or other eye hazard, light latex or nitrile gloves, lab coat or gown.
	Working with live animals (Animal Biosafety Level 1, ABL1).[5]	Animal bites, allergies.	Safety glasses or goggles for protection from splash or other eye hazard, light latex, nitrile or vinyl gloves for broken skin or skin rash, lab coat or gown. Consider need for wire mesh glove.
	Working with live animals (Animal Biosafety Level 2, ABL2).[5]	Animal bites, exposure to infectious material, allergies.	Safety glasses or goggles for protection from splash or other eye hazard, light latex, nitrile or vinyl gloves, lab gown, hair cover, shoe covers, surgical mask. Consider need for wire mesh glove.

Mark if applies	Radiological Hazards		
Yes	**Activity**	**Potential Hazard**	**Applicable PPE[1, 2]**
	Working with solid radioactive materials or waste.	Cell damage, potential spread of radioactive materials.	Safety glasses, impermeable gloves, lab coat.
	Working with radioactive materials in hazardous chemicals (corrosives, flammables, liquids, powders, etc.).	Cell damage or spread of contamination plus hazards for the specific chemical.	Safety glasses (or goggles for splash hazard), light chemical-resistant gloves, lab coat. Note: Select glove for the applicable chemical hazards above.
	Working with ultraviolet radiation.	Conjunctivitis, corneal damage, skin redness.	UV face shield and goggles, lab coat.

Mark if applies	Nanomaterial Hazard		
Yes	**Activity**	**Potential Hazard**	**Applicable PPE[1, 2]**
	Working with engineered nanomaterials. [9]	Inhalation, exposure, dermal exposure.	Goggles, gloves, lab coat.

Mark if applies	Physical Hazards		
Yes	**Activity**	**Potential Hazard**	**Applicable PPE**[1, 2]
	Working with cryogenic liquids.	Major skin, tissue, or eye damage.	Safety glasses or goggles for large volumes, impermeable insulated gloves, lab coat.
	Removing freezer vials from liquid nitrogen	Vials may explode upon rapid warming. Cuts to face/neck and frostbite to hands.	Goggles, face shield, impermeable insulated gloves, lab coat.
	Working with very cold equipment or dry ice.	Frostbite, hypothermia.	Safety glasses, insulated gloves (possibly warm clothing), lab coat.
	Working with hot liquids, equipment, open flames (autoclave, Bunsen burner, water bath, oil bath).	Burns resulting in skin or eye damage.	Safety glasses or goggles for large volumes, insulated gloves (impermeable insulated gloves for liquids, steam), lab coat.
	Glassware washing.	Lacerations.	Heavy rubber gloves, lab coat.
	Working with loud equipment, noises, sounds, alarms, etc.	Potential ear damage and hearing loss.	Earplugs or ear muffs as necessary.
	Working with a centrifuge.	Imbalanced rotor can lead to broken vials, cuts, exposure.	Safety glasses or goggles, lab coat, latex, vinyl, or nitrile gloves.
	Working with a sonicator.	Ear damage, exposure.	Safety glasses or goggles, lab coat, latex, vinyl, or nitrile gloves, ear plugs.
	Working with sharps.	Cuts, exposure.	Safety glasses or goggles, lab coat, latex, vinyl, or nitrile gloves.

[1] Chemical-resistant gloves are to be selected based on the specific chemical(s) and amounts used, visit OSU-Stillwater site "Chemical Guide and Permeation Tables" http://www.ehs.okstate.edu/hazmat/gloves.htm or see glove tables in vendor catalogs and online.

[2] Minimum PPE consists of long pants or equivalent, shoes that cover the entire foot, socks that cover the ankles; it is advisable to wear non-synthetic personal clothing.

[3] Use a chemical fume hood or other engineering control whenever possible. *Activities not conducted inside a chemical fume hood or with another engineering control (such as a local exhaust at the workbench) should be evaluated to determine if the activity presents a respiratory hazard. In this case a respirator may be required and a respiratory protection program must be in place per the laboratory safety program. Guidance can be found in the CHS Respiratory Protection Manual or by contacting the Laboratory Safety Coordinator.*

[4] See applicable Safety Data Sheet for hazards of chemicals in use.

[5] Solids such as dust, dander, etc. should be separately evaluated for the need to use respiratory protection.

[6] For a discussion of highly toxic chemicals, visit *http://www.healthsciences.okstate.edu/research/safety/manuals.php* and navigate to the OSU-CHS Chemical Hygiene Manual, "Hazard Control Guidelines".

[7] For a listing of carcinogens or reproductive toxicants see CAOSHA Proposition 65 at http://www.oehha.org/prop65/prop65_list/Newlist.html#files. To see the criteria OSHA uses for designation of carcinogenicity (Appendix 6) and reproductive toxicity (Appendix 7) go to https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10099.

[8] Use a Biosafety cabinet to minimize exposure. Activities that cannot be conducted inside Biosafety cabinet should be separately evaluated by the Regulatory Compliance Manager.

[9] Working with dry engineered nanomaterials (e.g. synthesizing, manipulation, storage) should be separately evaluated for respiratory protection.

Section 3: Conduct PPE Training

PPE training consists of **site specific training** conducted by the principle investigator or their designee. Verification is required to document that training has been conducted (see the following page).

Step 1.

The PI or their designee ensures the laboratory worker has completed all applicable safety training courses at http://www.healthsciences.okstate.edu/research/safety/.

1. The PI or their designee reviews the **completed** *Hazard Assessment Tool* (this document) with the lab workers. It describes the tasks in the lab when lab workers need PPE to protect themselves from exposure to hazards. In this step, the hazard assessment is used as a training tool.

2. While discussing lab activities and the associated hazards with lab staff, the supervisor will address how their lab obtains PPE, what types of PPE are used in the lab and for which tasks, where and how the PPE is stored and maintained, how to properly use the PPE, and discuss any limitations of the PPE. The supervisor should also discuss general PPE safety practices, including not wearing potentially contaminated PPE outside of lab hazard areas (e.g. hallways and eating areas).

Step 2.

When the supervisor believes the lab worker has demonstrated understanding, the lab worker(s) and the supervisor then sign the following, *Verification of PPE Training* form (next page), to document that PPE training has been conducted. A copy of this signed form is to be maintained in the Lab Safety Manual.

Step 3.

Repeat or conduct a refresher training whenever the hazard assessment is updated (at least annually).

Section 4: Verification of PPE Training

The following lab worker(s) of laboratory # _____ have reviewed the completed Hazard Assessment Tool for Personal Protective Equipment Use and have received the following training:

1. When PPE is necessary.
2. What PPE is required.
3. Where the PPE is located.
4. How to properly don, doff, adjust, and wear PPE.
5. The limitations of PPE.
6. The proper care, maintenance, useful life, and disposal of PPE.

LAB WORKER NAME (printed)	LAB WORKER SIGNATURE

As a part of this training, lab workers were informed of the personal protective equipment selected by this facility for their use. By my signature and those of the lab workers listed above, we certify that each lab worker has demonstrated his/her understanding of this training.

_____

Signature of PI Date