LABORATORY PERSONAL PROTECTIVE EQUIPMENT (PPE) HAZARD ASSESSMENT

PURPOSE AND DESCRIPTION

The Laboratory Personal Protective Equipment (PPE) Hazard Assessment Guide identifies hazards to which laboratory workers may be exposed and specifies PPE to protect against these hazards during work operations. When completed, the document and its associated training will satisfy the Department of Labor and Industries requirements for PPE as required in Washington Administrative Code (WAC) 296-800-160.

This document must be completed by the Principal Investigator (PI), Lab Manager or their designee. This person must conduct a laboratory hazard assessment that is specific to operations in their laboratory space(s). EH&S personnel are available to assist with the hazard assessment and can review the form. EH&S may be consulted by calling 206.543.7388. The PI/Lab Manager is responsible for ensuring PPE requirements are followed.

This hazard assessment guide consists of the following:

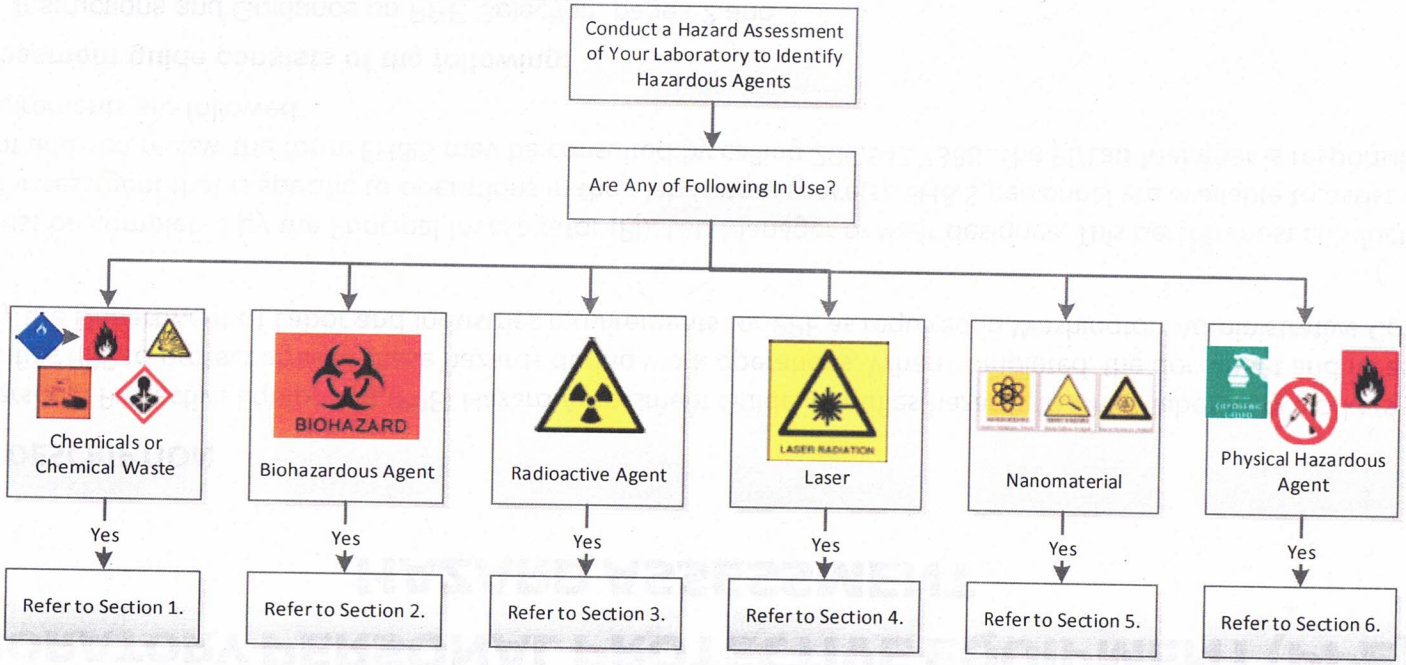
Fablab CSE2 G15

SECTION 1: INSTRUCTIONS AND GUIDANCE ON PPE SELECTION

The Principal Investigator, Lab Manager or their designee will conduct and certify the hazard assessment.

Conduct a hazard assessment of the laboratory operations using the Laboratory PPE Hazard Assessment.

- Complete each section for the potentially hazardous agent(s) used in your laboratory: (1) chemical, (2) biohazard, (3) radioactive, (4) laser, (5) nanomaterial and/or (6) physical.
- This guide will assist in identifying work tasks that require the use of PPE to protect lab staff from exposures to hazards. For each work task listed, check the "Yes" box if the work is performed in your laboratory. If not, check the "No" box. As needed, add tasks to the list to customize it for your laboratory.
- Note the required PPE for each task is designated by a check mark (✓) before the item.
- Check additional boxes (☐) as appropriate and/or check "Other PPE: Specify" and describe in the space provided the lab-specific PPE required for the work task.



GENERAL GUIDANCE ON PERSONAL PROTECTIVE EQUIPMENT (PPE) SELECTION

1. **Minimum Laboratory PPE.** In general, the minimum PPE that should be worn while performing laboratory work is the following:
   - Safety glasses
   - Disposable nitrile or other appropriate chemical resistant gloves
   - Lab coat (full length) and long pants, long skirt or equivalent leg covering (no shorts)
   - Laboratory footwear (as described below)
2. **Chemical-Resistant Gloves**. Chemical-resistant gloves must be selected based on the specific chemical(s) used and manufacturer's glove permeation and compatibility charts. Guidance is available at www.ehs.washington.edu/resource/laboratory-safety-manual-510.
3. **Laboratory Footwear.** Laboratory footwear should fully cover the feet to protect against chemical spills. Avoid sandals, flip flops, flats, canvas/breathable fabric tops and shoes constructed of mesh (such as athletic shoes) unless impervious chemical-resistant booties that protect the entire foot are worn over them.
4. **Airborne/Inhalation Hazard: Engineering Controls and Respiratory Protection**.
   - **Chemical Fume Hood**. When materials have a potential for becoming airborne, use a chemical fume hood or other engineering control whenever possible. Activities that generate airborne contaminants or odors that are not conducted inside of a chemical fume hood or using some other engineering control (such as a local exhaust at the workbench) should be evaluated to determine if the activity presents an inhalation hazard.
   - **Biosafety Cabinet Use**. Use a biosafety cabinet to minimize exposure. Activities that cannot be conducted inside of a biosafety cabinet should be separately evaluated by the EH&S Biosafety Office. For BSL-3 or ABL-3 activities, the PPE requirements will be addressed by the BSL-3 facility.
   - **Respiratory Protection**. If respiratory protection is identified as a necessary control during the hazard assessment, users must be enrolled in the UW Respiratory Protection Program. This includes EH&S performing a respirator-specific hazard assessment, as well as having all users undergo a medical evaluation to wear a respirator, respirator training and respirator fit testing. Contact EH&S at 206.543.7388 or uwresp@uw.edu for assistance in these steps. Guidance is available at www.ehs.washington.edu/workplace/respiratory-protection.

1.0 CHEMICAL HANDLING PROTECTION (PAGE 1 OF 5)

Task Performed Yes	Task Performed No	Task Performed in Lab (Modify wording to fit your needs)	Potential Hazards	PPE Designated For Lab-Specific Tasks
☒	☐	C1. Work with solids of low or moderate toxicity	• Skin damage • Eye damage • Toxic by skin contact	✓ **Eyes:** Safety glasses ✓ **Hands:** Disposable nitrile or appropriate chemical resistant gloves ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3). ☐ **Face**: Face shield as splash or splatter may occur ☐ **Other PPE, Specify:**
☐	☒	C2. Work with small volumes (<100 ml.) of corrosive (acids or caustics) liquids or solids	• Skin damage • Eye damage • Toxic by skin contact	✓ **Eyes:** Safety glasses ✓ **Hands:** Disposable nitrile or appropriate chemical resistant gloves ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3).
☐	☒	C3. Work with large volumes of corrosive (acids or caustics) or acutely toxic materials that may splash	• Inhalation • Skin damage • Eye damage • Toxic by skin contact	✓ **Eyes:** Safety goggles ✓ **Face:** Face shield as splash or splatter may occur ✓ **Hands:** Disposable nitrile or appropriate chemical resistant gloves ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3). ☐ **Body:** Chemical resistant apron ☐ **Inhalation:** Respiratory protection; *contact EH&S for respiratory protection program assistance* ☐ **Other PPE, Specify:**
☒	☐	C4. Work with small volumes (<100 ml.) of flammable solvents or materials	• Skin damage • Eye damage • Toxic by skin contact	✓ **Eyes:** Safety glasses ✓ **Hands:** Disposable nitrile or appropriate chemical resistant gloves ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3).
☒	☐	C5. Work with large volumes (>100 ml.) of flammable solvents with a source of heat or ignition nearby	• Inhalation • Skin damage • Eye damage • Toxic by skin contact • Fire	✓ **Eyes:** Safety glasses ✓ **Hands:** Disposable nitrile or appropriate chemical resistant gloves ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3). ☐ **Face**: Face shield as splash or splatter may occur ☐ **Inhalation:** Respiratory protection; *contact EH&S for respiratory protection program assistance* ☐ **Other PPE, Specify:**

1.0 CHEMICAL HANDLING PROTECTION (Page 2 of 5)

Task Performed Yes	Task Performed No	Task Performed in Lab (Modify wording to fit your needs)	Potential Hazards	PPE For Lab-Specific Tasks
☐	☒	C6. Work with chemicals of high acute toxicity (e.g. hydrogen fluoride, hydrogen cyanide)	• Inhalation • Skin damage • Eye damage • Toxic by skin contact	✓ **Eyes:** Safety glasses ✓ **Hands:** Disposable nitrile or appropriate chemical resistant gloves ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3). ☐ **Eyes**: Safety goggles ☐ **Face**: Face shield as splash or splatter may occur ☐ **Inhalation:** Respiratory protection; *contact EH&S for respiratory protection program assistance* ☐ **Other PPE, Specify:**
☐	☒	C7. Work with particularly hazardous agent such as: • Human carcinogen • Mutagen • Antineoplastic • Reproductive toxin	• Inhalation • Skin damage • Eye damage • Toxic by skin contact	✓ **Eyes:** Safety glasses ✓ **Hands: For Carcinogens, Mutagens, and Chemotherapy/Other Hazardous Drugs**: Chemo exam gloves that are tested to meet ASTM D6978-05; Double glove ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ☐ **Eyes**: Safety goggles ☐ **Face**: Face shield as splash or splatter may occur ☐ **Inhalation:** Respiratory protection; *contact EH&S for respiratory protection program assistance* ☐ **Other PPE, Specify:**
☒	☒	C8. Work with an apparatus with contents under pressure or vacuum (mm of Hg, psi, or torr)	• Skin damage • Eye damage	✓ **Eyes:** Safety glasses ✓ **Hands:** Disposable nitrile or appropriate chemical resistant gloves ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ☐ **Face**: Face shield ☐ **Eyes and/or Face**: For high risk activities - Safety goggles and face shield ☐ **Body:** For chemical use, chemical-resistant apron ☐ **Other PPE, Specify:**

1.0 CHEMICAL HANDLING PROTECTION (Page 3 of 5)			
Task Performed Yes No	**Task Performed in Lab (Modify wording to fit your needs)**	**Potential Hazards**	**PPE For LabSpecific Tasks**
☐ ☒	C9. Work with air or water reactive chemicals	• Exposure to toxic gases, heat, and/or energy • Inhalation • Skin damage • Eye damage • Fire	✓ **Eyes:** Safety goggles ✓ **Hands:** Disposable nitrile or appropriate chemical resistant gloves ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ☐ **Face**: Face shield as splash or splatter may occur ☐ **Hands**: Heat resistant or chemical resistant gloves; please specify: ☐ **Body:** Flame-resistant lab coat if fire hazard is present ☐ **Other PPE, Specify:**
☐ ☒	C10. Work with pyrophoric materials	• Fire • Severe burns • Inhalation • Skin damage • Eye damage	✓ **Eyes**: Safety goggles ✓ **Hands**: Inner disposable nitrile or appropriate chemical resistant gloves ✓ **Hands:** Outer heat-resistant gloves ✓ **Body:** Flame resistant lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ✓ **Body:** Synthetic clothing must not be worn when working with pyrophoric materials ☐ **Face**: Face shield as splash or splatter may occur ☐ **Other PPE, Specify**:
☐ ☒	C11. Work with potentially explosive chemicals	• Detonation • Flying debris • Skin damage • Eye damage • Fire	✓ **Eyes**: Safety goggles ✓ **Hands**: Inner disposable nitrile or appropriate chemical resistant gloves ✓ **Hands:** Outer heat-resistant gloves ✓ **Body:** Flame resistant lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ✓ **Body:** Synthetic clothing must not be worn when working with explosive materials ☐ **Face**: Face shield as splash or splatter may occur ☐ **Eyes, Face, or Body**: Blast shield for high risk activities ☐ **Other PPE, Specify**:

1.0 CHEMICAL HANDLING PROTECTION (Page 4 of 5)

Task Performed Yes	Task Performed No	Task Performed in Lab (Modify wording to fit your needs)	Potential Hazards	PPE For Lab-Specific Tasks
☒	☐	C12. Work with high temperature equipment or objects	• Burns • Fire	✓ **Eyes**: Safety goggles ✓ **Hands**: Inner disposable nitrile or appropriate chemical resistant gloves ✓ **Hands:** High temperature thermal insulated gloves ✓ **Body:** Flame resistant lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ✓ **Body:** Synthetic clothing must not be worn when working with high temperature equipment or objects ☐ **Face**: Face shield as splash or splatter may occur ☐ **Other PPE, Specify**:
☐	☒	C13. Work with cryogenic material	• Burns • Frostbite • Eye damage	✓ **Eyes**: Safety glasses ✓ **Eyes:** Safety goggles for large volumes ✓ **Face**: Face shield as splash or splatter may occur ✓ **Hands**: Inner gloves - disposable nitrile or appropriate chemical resistant gloves ✓ **Hands**: Outer gloves - cryogenic low temperature insulated gloves ✓ **Body:** Lab coat; long pants, skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ☐ **Other PPE, Specify**:
☐	☒	C14. List any other particularly hazardous lab task involving chemicals	Conduct risk assessment: Hazard depends on task and chemical properties • Inhalation • Skin damage • Eye damage	✓ **Eyes:** Safety glasses ✓ **Hands:** Disposable nitrile or other appropriate chemical resistant gloves ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ☐ **Face**: Face shield as splash or splatter may occur ☐ **Body**: Chemical resistant apron ☐ **Inhalation:** Respiratory protection; *contact EH&S for respiratory protection program assistance.* ☐ **Other PPE, Specify:**

1.0 CHEMICAL HANDLING PROTECTION (Page 5 of 5)

Task Performed Yes	Task Performed No	Task Performed in Lab (Modify wording to fit your needs)	Potential Hazards	PPE For Lab-Specific Tasks
☒	☐	C15. Minor (or small) spill cleanup; spill can be cleaned up with standard spill kit	• Inhalation • Skin damage • Eye damage	✓ **Eyes**: Safety goggles ✓ **Face**: Face shield as splash or splatter may occur ✓ **Hands**: Chemical resistant gloves for spill cleanup ✓ **Body:** Lab coat; long pants, skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ✓ As needed, contact EH&S for assistance ☐ **Foot:** Shoe covers ☐ **Other PPE, Specify**:
☐	☒	C16. Large spill cleanup; spill is too large or complex to clean up with standard spill kit	• Inhalation • Skin damage • Eye damage	✓ **Mandatory: Follow required procedures** • If possible, stop or contain the release • Evacuate and secure the area • Assist injured or contaminated persons • Call 911 for assistance; report injuries, fires, or request cleanup assistance • Call EH&S for assistance
☐	☐			
☐	☐			

2.0 BIOHAZARDOUS AGENT PROTECTION GENERAL

Task Performed Yes	Task Performed No	Task Performed in Lab (Modify wording to fit your needs)	Potential Hazards	PPE For Lab-Specific Tasks
☐	☒	B1. Work with human blood, body fluids, cell lines (primary or established), tissues or bloodborne pathogens (BBP).	• Exposure to infectious material	✓ **Hand:** Latex or nitrile gloves ✓ **Body:** Lab coat ✓ **Face:** Spatter shield on tabletop if not working in a biosafety cabinet OR ✓ **Face:** Face shield if not working in a biosafety cabinet or behind a spatter shield OR ✓ **Face:** Safety glasses and a mask if not working in a biosafety cabinet or behind a spatter shield ☐ **Eye:** Safety glasses ☐ **Body:** Disposable gown (optional) ☐ **Other PPE, Specify:**
☐	☒	B2. Work with animal and/or human specimens preserved in fixative (such as formalin or paraformaldehyde solution) Preserve animal and/or human specimens with fixative (such as formalin or paraformaldehyde solution)	• Exposure to fixative used to preserve specimen If tissue is fixed, there is no longer an exposure to infectious material.	✓ **Eye:** Safety glasses ✓ **Hand:** Impermeable glove for preserved specimens that is chemical resistant to fixative used ✓ **Body:** Lab coat ☐ **Body:** Disposable gown ☐ **Other PPE, Specify:**
☐	☒	B3. Work with radioactive human blood, body fluids or bloodborne pathogens (BBP).	• Exposure to infectious material • Cell damage • Potential spread of radioactive contaminants	✓ **Hand:** Latex or nitrile gloves ✓ **Eye:** Safety glasses or safety goggles for splash hazard ✓ **Face:** Face shield as splash or splatter may occur ✓ **Body:** Lab coat ☐ **Body:** Disposable gown ☐ **Other PPE, Specify:**
☐	☐			

2.1 BIOHAZARDOUS AGENT PROTECTION – RISK GROUP 1, 2, 3

Task Performed Yes	Task Performed No	Task Description (Modify wording to fit your needs)	Potential Hazards	PPE For Lab-Specific Tasks
☐	☒	B4. Work with agents or recombinant DNA classified as Risk Group 1 and requiring Biosafety Level 1 (BSL-1) containment	• Biological agents that typically pose a minimal potential for infection by injection, skin exposure, ingestion or inhalation	✓ **Hand:** Latex or nitrile gloves ✓ **Body:** Lab coat ☐ **Eye:** Safety glasses for splash or other eye hazard ☐ **Eye:** Safety goggles for splash or other eye hazard ☐ **Body:** Disposable gown ☐ **Other PPE, Specify**:
☐	☒	B5. Manipulation of recombinant DNA, cell lines, viruses, bacteria or other organisms classified as Risk Group 2 and requiring Biosafety Level 2 (BSL-2) containment Perform aerosol generating procedure: Vortex, sonicate, pipette, tissue harvest	• Biological agents that pose a moderate potential for infection by injection, skin exposure, ingestion or inhalation	✓ **Eye:** Safety glasses if not working in a biosafety cabinet ✓ **Hand:** Latex or nitrile gloves ✓ **Body:** Lab coat ☐ **Eye:** Safety goggles if not working in a biosafety cabinet ☐ **Body:** Surgical gown ☐ **Other PPE, Specify**:
☐	☒	B6. Manipulation of infectious materials classified as Risk Group 3 but manipulated in a BSL 2 facility with BSL-3 containment practices (BSL 2+).	• Biological agents that pose a moderate or serious potential for infection by injection, skin exposure, ingestion or inhalation	✓ **Eye:** Safety glasses for splash or other eye hazard ✓ **Hands:** Nitrile gloves (double) ✓ **Body:** Disposable gown (preferred) that ties in back ✓ **Inhalation**: Respiratory protection as determined by risk assessment; *contact EH&S for respiratory protection program assistance* ☐ **Eye:** Safety goggles for splash or other eye hazard ☐ **Body:** Lab coat ☐ **Other PPE, Specify**:
☐	☒	B7. Manipulation of infectious materials classified as Risk Group 3 and requiring Biosafety Level 3 (BLS-3) containment	• Biological agents that pose a serious or lethal potential for infection by injection, skin exposure, ingestion or inhalation	✓ **Eye:** Safety glasses for splash or other eye hazard ✓ **Hands:** Nitrile gloves (double) ✓ **Body:** Full disposable coverall suit (preferred) ✓ **Foot:** Shoe cover or dedicated shoe ✓ **Inhalation**: Respiratory protection as determined by risk assessment; *contact EH&S for respiratory protection program assistance* ☐ **Eye:** Safety goggles for splash or other eye hazard ☐ **Other PPE, Specify**:

2.2 BIOHAZARDOUS AGENT PROTECTION – BIOSAFETY LEVEL 1, 2, 3

Task Performed Yes	Task Performed No	Task Description (Modify wording to fit your needs)	Potential Hazards	PPE For Lab-Specific Tasks Follow Appropriate BSL Practices
☐	☒	B8. Work with live animals: General safety concerns	• Animal bites • Exposure to animal allergens	☐ **Animal bites:** Restraints or bite-resistant gloves ☐ **Animal allergen:** Voluntary use of N95 respirator or PAPR. *For allergens, ontact EH&S for respiratory protection program assistance.* ☐ **Specific Pathogen Free (SPF) Area:** Hair bonnet, gown, shoe covers, gloves ☐ **Other PPE, Specify**:
☐	☒	B9. Work with live animals: Animal Biosafety Level 1 (ABSL-1)	• Exposure to infectious material	✓ **Hands:** Nitrile or vinyl gloves for broken skin ✓ **Body:** Lab coat OR ✓ **Body:** Disposable gown ☐ **Eye:** Safety glasses for splash or other eye hazard ☐ **Eye:** Safety goggles for splash or other eye hazard ☐ **Other PPE, Specify**:
☐	☒	B10. Work with live animals: Animal Biosafety Level 2 (ABSL-2)	• Exposure to infectious material	✓ **Eye:** Safety goggles for splash or other eye hazard ✓ **Hands:** Nitrile or vinyl gloves ✓ **Body:** Disposable gown ☐ **Foot:** Shoe covers ☐ **Other PPE, Specify**:
☐	☒	B11. Work with live animals: Animal Biosafety Level 2+ (ABSL-2+)	• Exposure to infectious material	✓ **Eye:** Safety glasses for splash or other eye hazard ☐ **Eye:** Safety goggles for splash or other eye hazard ✓ **Hands:** Nitrile or vinyl gloves ✓ **Body:** Disposable gown (tie in the back) ✓ **Foot:** Shoe covers ☐ **Other PPE, Specify**:

2.2 BIOHAZARDOUS AGENT PROTECTION – BIOSAFETY LEVEL 1, 2, 3

Task Performed Yes	Task Performed No	Task Description (Modify wording to fit your needs)	Potential Hazards	PPE For Lab-Specific Tasks Follow Appropriate BSL Practices
☐	☒	B12. Work with live animals: Animal Biosafety Level 3, (ABSL-3).	• Exposure to infectious material • Exposure to infectious agent by airborne transmission	✓ **Eye:** Safety glasses for splash or other eye hazard ☐ **Eye:** Safety goggles for splash or other eye hazard ✓ **Hands:** Nitrile or vinyl gloves ☐ **Body:** Disposable gown ✓ **Foot:** Shoe covers ✓ **Inhalation:** Mandatory use of N95 respirator or PAPR, as determined by risk assessment. *For mandatory use, contact EH&S for respiratory protection program assistance.* ✓ **Additional PPE, Specify:** A full body disposable coversuit is appropriate in an animal facility.
☐	☐			
☐	☐			

3.0 RADIOACTIVE AGENT PROTECTION: IONIZING, ULTRAVIOLET, INFRARED

Task Performed Yes	Task Performed No	Task Performed in Lab (Modify wording to fit your needs)	Potential Hazards	PPE For Lab-Specific Tasks
☐	☒	R1. Work with solid radioactive material or solid radioactive waste	• Cell damage • Potential spread of radioactive contamination	✓ **Eyes**: Safety glasses ✓ **Hands**: Disposable nitrile or other appropriate radioactive material impermeable gloves ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ✓ **Work on Sealed Source:** Minimum PPE is unnecessary when working with sealed radiation sources
☐	☒	R2. Work with liquid radioactive material (in corrosives, flammables, and aqueous liquids, including liquid radioactive waste) or radioactive powders	• Cell damage • Potential spread of radioactive contamination • Hazards presented by the specific chemical	✓ **Eyes:** Safety glasses ✓ **Hands:** Disposable nitrile or appropriate chemical resistant gloves compatible with work with radioactive materials ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3)
☐	☒	R3. Work with ultraviolet radiation	• Conjunctivitis • Corneal damage • Skin burns	✓ **Eye:** UV face shield and/or goggles ✓ **Hand:** Nitrile gloves if hand exposure is possible ✓ **Body:** Lab coat
☐	☒	R4. Work with infrared-emitting equipment (e.g. glass blowing) Only contained laser cutters	• Cataracts • Burns to cornea	✓ **Eye:** Appropriate polycarbonate infrared filter glasses ✓ **Body:** Flame resistant lab coat
☐	☐			
☐	☐			

4.0 LASER PROTECTION

Task Performed Yes	Task Performed No	Task Performed in Lab (Modify wording to fit your needs)	Potential Hazards	PPE For Lab-Specific Tasks
		OPEN BEAM		
☐	☒	L1. Perform beam alignment or laser experiment; repair or maintenance that requires working with an open laser beam, and/or defeating the interlock(s) on any Class 3b or Class 4 laser system	• Eye damage	✓ **Eye:** Appropriate laser safety goggles/glasses with optical density based on individual beam parameters; *contact EH&S to determine appropriate optical density.*
☐	☒	L2. View a Class 3R laser beam with magnifying optics (including eyeglasses)	• Eye damage	✓ **Eye:** Appropriate laser safety goggles/glasses with optical density based on individual beam parameters; *contact EH&S to determine appropriate optical density.*
☐	☒	L3. Work with a Class 3b open beam laser system with the potential for producing direct or specular (mirror-like) reflections	• Eye damage	✓ **Eye:** Appropriate laser safety goggles/glasses with optical density based on individual beam parameters; *contact EH&S to determine appropriate optical density.*
☐	☒	L4. Work with infrared-emitting equipment (e.g. glass blowing) Only contained laser cutters with fully protective and interlocked covers.	• Cataracts • Burns to cornea	**Eye:** Appropriate laser safety goggles/glasses with optical density based on individual beam parameters; *contact EH&S to determine appropriate optical density.* ✓ **Hands:** Nitrile gloves ✓ **Body:** Long sleeved shirt (tightly wound fabric) ✓ **Body:** Lab coat *Long sleeves, lab coat, gloves, etc. are required only in the NHZ (Nominal Hazard Zone)*
☐	☒	L5. Handle dye laser materials, such as powdered dyes, chemicals and solvents	• Cancer • Fire • Explosion	✓ **Eyes:** Safety glasses ✓ **Hands:** Chemical resistant gloves ✓ **Body:** Flame resistant lab coat or coveralls
☐	☒	L6. Maintain and repair power sources for Class 3B and Class 4 laser systems	• Electrocution • Fire • Explosion	✓ **Eye:** Safety glasses ✓ **Hands:** Insulated gloves ✓ **Body:** Flame resistant lab coat ✓ **Body** Coveralls

5.0 NANOMATERIAL PROTECTION

Task Performed Yes	Task Performed No	Task Performed in Lab (Modify wording to fit your needs)	Potential Hazards	PPE For Lab-Specific Tasks
☐	☒	N1. Work with bound or wet nanomaterials	• Inhalation • Skin damage • Eye damage • Chemical exposure	✓ **Eyes:** Safety glasses ✓ **Face**: Face shield as splash or splatter may occur ✓ **Hands**: Disposable nitrile or other appropriate chemical resistant gloves ✓ **Hands**: Routinely replace gloves to minimize exposure and hand contamination ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ☐ **Other PPE, Specify**:
☐	☒	N2. Work with unbound or dry engineered nanomaterials	• Inhalation • Skin damage • Eye damage • Chemical exposure	For unbound or dry material: ✓ **Eyes:** Safety glasses ✓ **Face**: Face shield as splash or splatter may occur ✓ **Hands**: Disposable nitrile or other appropriate chemical resistant gloves ✓ **Hands**: Routinely replace gloves to minimize exposure and hand contamination ✓ **Body:** Lab coat made of non-woven fabric and elastic at the wrists; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ✓ **Inhalation:** Half face respirator with P100 cartridge if working with aerosolizing nanomaterials outside of a vented work enclosure; *contact EH&S for respiratory protection program assistance.* ✓ **Removal of PPE:** Give special attention to technique used to remove and dispose of contaminated PPE to avoid skin contact ☐ **Other PPE, Specify**:
☐	☐			

6.0 PHYSICAL HAZARD PROTECTION (PAGE 1 OF 2)

Task Performed Yes	Task Performed No	Task Performed in Lab (Modify wording to fit your needs)	Potential Hazards	PPE For Lab-Specific Tasks
☐	☒	P1. Work with cryogenic liquids	• Skin damage • Eye damage	✓ **Eyes**: Safety glasses ✓ **Face**: Face shield ✓ **Hands**: Cryogenic, low temperature insulated gloves ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ☐ **Body:** Cryogenic apron
☐	☒	P2. Remove freezer cryo vials from liquid nitrogen	• Vials may explode upon rapid warming • Cuts to face/neck and frostbite to hands	✓ **Eyes**: Safety glasses ✓ **Face**: Face shield ✓ **Hands**: Cryogenic, temperature thermal insulated gloves ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ☐ **Body:** Cryogenic apron
☐	☒	P3. Work with very cold equipment or dry ice	• Frostbite • Hypothermia	✓ **Eyes**: Safety glasses ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3 ✓ **Hands**: Cryogenic low temperature insulated gloves
☐	☒	P4. Work with hot liquids, heating equipment and/or open flames (autoclave, Bunsen burner, water bath, oil bath)	• Burns resulting in skin or eye damage	✓ **Eyes:** Safety glasses ✓ **Hands:** Inner disposable nitrile or appropriate chemical resistant gloves ✓ **Hands:** Outer thermal insulated gloves ✓ **Body:** Lab coat; long pants, long skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ✓ **Eyes:** Safety goggles for work with hot liquids ✓ **Face**: Face shield as splash or splatter may occur ✓ **Hands:** Autoclave gloves, impermeable insulated gloves for liquids amd steam
☒	☐	P5. Wash glassware	• Lacerations if glass breaks • Splash from cleaning agents	✓ **Eyes**: Safety glasses ✓ **Hands**: Nitrile or appropriate chemical resistant gloves ✓ **Body:** Lab coat; long pants, skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ☐ **Face**: Face shield ☐ **Hands:** Cut resistant gloves if glass breaks

6.0 PHYSICAL HAZARD PROTECTION (Page 2 of 2)

Task Performed Yes	Task Performed No	Task Performed in Lab (Modify wording to fit your needs)	Potential Hazards	PPE For Lab-Specific Tasks
☒	☐	P6. Work with loud equipment, noises, sounds, alarms, etc.	• Potential ear damage and hearing loss	✓ **Hearing:** Earplugs or ear muffs, as necessary; *contact EH&S for noise exposure assessment.*
☒	☒	P7. Work with an apparatus with contents under pressure or vacuum _____ (mm of Hg, psi, or torr) Sintering furnace	• Skin damage • Eye damage	✓ **Eyes**: Safety glasses ✓ **Hands**: If chemicals used, nitrile or other appropriate chemical-resistant glove ✓ **Body:** Lab coat; Long pants, skirt, or equivalent leg covering (no shorts); lab footwear (Refer to Page 3) ☐ **Face**: Face shield ☐ **Eyes and/or Face**: For high risk activities - Safety goggles and face shield ☐ **Body:** If chemicals used, chemical-resistant apron ☐ **Other PPE, Specify**
☒	☐	P8. Work with sharps or broken glass	• Cuts	✓ **For Cuts**: Use tongs for broken glass and designated sharps container for contaminated wastes ✓ **For Cuts**: Cut resistant outer glove (Kevlar) with nitrile inner gloves
☐	☒	P9. Work with sharps and/or empty a syringe used with chemicals	• Exposure to aerosols from syringe	✓ **For Aerosols:** Safety glasses and mask. ☐ **Other PPE, Specify:**
☐	☒	P10. Work with compressed gases inside environmental chambers	• Asphyxiation • Toxic gas exposure	✓ Employee is not allowed to enter and work inside of an oxygen deficient or hazardous chamber.
☐	☒	P11. Maintain and repair electrically powered equipment	• Electrocution	✓ **Eyes**: Safety glasses ✓ **Hands**: Insulated gloves ✓ **Body:** Coveralls
☐	☐			

SECTION 3: CERTIFY THE HAZARD ASSESSMENT

Please certify that the hazard assessment for the laboratory has been completed by filling out and signing this page.

CERTIFICATION OF THE LABORATORY HAZARD ASSESSMENT AND PPE SELECTION

Principal Investigator's (PI) Name (Print Name): Shwetak Patel	Department/Unit: Paul G. Allen School of CSE	
Building(s): Bill and Melinda Gates Center for CSE	Room(s): CSE2 G15, G15A, G15C	
Lab Manager's Name: Alexander Lefort	Lab Manager's Phone: 206-685-9198	
Completed by (Print Name): Alexander Lefort	Signature: Alexander Lefort	Date 02/22/2023
Signature of PI:		Date

SECTION 4: PPE TRAINING DOCUMENTATION

Laboratory safety training must be conducted by the Principal Investigator, Lab Manager or their designee. Training will identify and discuss potentially hazardous tasks performed in the lab and selection and use of lab-specific PPE to protect the laboratory worker or researcher. The training content, instructor and student attendees must be documented. To provide adequate training, the PI, Lab Manager or their designee will provide the following:

1. Identify all applicable safety training courses needed for each staff member and assure that each staff member has these courses.
2. The PI, lab manager, or their designee will review the completed Lab PPE Hazard Assessment Guide with the employee. It describes the operations in the lab where employees need PPE for protection against exposure to hazards. In this step, the hazard assessment is used as a training tool. While discussing lab operations and the associated hazards with lab staff, the manager will address the following:
    - How the 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 inspect and what to look for to confirm PPE is in good condition before putting it on. If not, place the PPE.
    - How to put on, wear, adjust for proper fit, and remove PPE
    - How to properly use the PPE
    - How to properly decontaminate and clean reusable PPE, and how to properly dispose of single-use PPE
    - Discuss any limitations of the PPE
    - General PPE safety practices, including not wearing PPE outside of lab hazard areas (e.g. hallways and eating areas).
3. Each trained lab staff member will sign the training documentation to acknowledge that they have reviewed and been trained on the Laboratory PPE Assessment Guide.
4. Conduct refresher training whenever the hazard assessment and/or PPE selected for use is updated.

Laboratory PPE Hazard Assessment Guide Training Acknowledgement:

Principal Investigator: Shwetak Patel

Department/Unit: CSE

Building: Bill and Melinda Gates Center for CSE

Room: CSE2 G15, G15A, G15C

Trainer: Alexander Lefort

Trainer Job Title: Lab Manager

I have read, asked questions, and understand the PPE requirements for the activity/materials described for my work.

Date	Name of Person Trained	Job Title	Employee or Student ID Number	Signature
☆	All trainings recorded on digital Training Records spreadsheet. Students sign the "Rules for the Use of the Paul G. Allen ~~Center~~ School Fabrication Research Lab" form when trained. This is stored in the training records cabinet of the lab manager.	Fabrication Research Lab		