LABORATORY PERSONAL PROTECTIVE EQUIPMENT (PPE) ASSESSMENT TOOL

Principal Investigator Name:	**Building:**	
Room:	**Phone:**	
Signature of Principal Investigator:	**Date:**	
Completed by (name):	**Signature:**	**Date**

This form must be completed by the PI, Lab Supervisor, Safety officer or their designee to conduct a laboratory hazard assessment specific to activities in their laboratories. The laboratory hazard assessment identifies hazards to employees, research assistants, undergraduate research assistants, volunteers and specifies personal protective equipment (PPE) to protect them during daily laboratory activities. This assessment consists of two sections. **Section 1:** Laboratory PPE Assessment & **Section 2:** Conduct PPE Training

PIs/Lab supervisors or Safety officers are responsible for enforcing PPE requirements in assigned labs. Department of Chemistry Safety Coordinator and EH&S are available to assist you with completing this form or with reviewing it after you have completed it. EH&S may be consulted by email julie10@usf.edu or by calling 813-974-1106.

Section 1: Laboratory PPE Hazard Assessment

In this section, the PI/Lab supervisor, safety officer or designee will:

- Conduct a hazard assessment of the laboratory using the PPE Assessment Tool. The Tool will assist to identify activities when PPE is needed to protect lab personnel from exposure to hazards.
- Certify the hazard assessment for the laboratory by signing the above table.

The following checklist provides an overview of lab activities with associated potential hazards and generic recommendations for PPE.

Lab-specific PPE policy – the Principal Investigator or class instructor reserves the right to enforce a more stringent PPE policy than what is described in this document.

Chemical Hazards (see below for explanation of CSL Levels)					
Check if applicable	Activity	Potential Hazard	Engineering Controls	Administrative Controls	Recommended PPE
☐	Small volumes of mildly corrosive liquids pH>2 or <12.5 CSL 2-3	• Eye or skin damage • Lung damage from inhalation	Adequate ventilation, chemical fume hood, or local exhaust. If unavailable, a respirator may be required (contact EH&S)	• Written procedure (SOP) • Safety Data Sheets (SDS) • Job-specific training • EH&S Lab and Research training	•Safety glasses or chemical splash goggles •Light chemical resistant gloves (disposable nitrile, latex). See the chemical glove compatibility chart •Lab coat
☐	Large volumes of highly corrosive liquids pH<2 or >12.5 Work where there is a splash hazard CSL 4	• Extensive eye or skin damage • Lung damage from inhalation	Adequate ventilation, chemical fume hood, or local exhaust. If unavailable, a respirator may be required (contact EH&S)	• Peer-reviewed written procedure (SOP) • Safety Data Sheets (SDS) • Job-specific training • EH&S Lab and Research training • Consider pre-diluted corrosive solutions	•Chemical splash goggles •Face shield •Heavy chemical resistant gloves (neoprene or butyl), especially if hands will be immersed. See the chemical glove compatibility chart •Lab coat •Chemical resistant apron
☐	Acutely toxic corrosive liquids Any volume of hydrofluoric acid Any concentration of perchloric acid CSL 4	• Extensive eye or skin damage • Lung damage from inhalation Poisoning through skin contact	Acid resistant fume hood	• Peer-reviewed written procedure (SOP) • Safety Data Sheets (SDS) • Job-specific training • EH&S Lab and Research training Consider pre-diluted corrosive solutions Practice before working with live material	•Chemical splash goggles •Face shield •Heavy chemical resistant gloves (neoprene or butyl) See the chemical glove compatibility chart •Lab coat •Chemical resistant apron

☐	Small volumes of organic solvents, flammable organic compounds, or oxidizers Flash point at or above 73°F (22.8°C) but less than 100°F (37.8°C). CSL 2,3	Eye or skin damage Poisoning through skin contact	Adequate ventilation, chemical fume hood, or local exhaust. If unavailable, a respirator may be required (contact EH&S)	•SOP, Research-specific training, and EH&S training •Purchase prepared solutions	•Safety glasses or chemical splash goggles •Light chemical resistant gloves •(nitrile, latex). See the chemical glove compatibility chart to choose appropriate chemical resistant gloves specific to the chemical being used •Lab coat
☐	Large volumes of organic solvents, flammable organic compounds, or oxidizers Flash point below 73°F (22.8°C) and boiling point below 100°F. CSL 4	Extensive eye or skin damage Lung damage from inhalation Poisoning through skin contact Fire	Chemical fume hood	•Peer-reviewed SOP, Research-specific training, and EH&S training •Do not store large volumes •Handle in areas free of ignition sources •Do not heat with open flame (use steam bath, water bath, heating mantle, hot air bath) •Bond and ground metal equipment to avoid static sparks	•Chemical splash goggles •Face shield •Heavy chemical resistant gloves (neoprene or butyl) , especially if hands will be immersed. See the chemical glove compatibility chart to choose appropriate chemical resistant gloves specific to the chemical being used •Flame resistant lab coat Chemical resistant apron

☐	Pyrophoric liquids, air and/or water reactive liquids in any quantity CSL 4	Extensive eye or skin damage Lung damage from inhalation Poisoning through skin contact Fire	Chemical fume hood Inert atmosphere glove bag or glove box	•Peer-reviewed SOP, Research-specific training, and EH&S training •Practice before working with live material	•Chemical splash goggles •Face shield •Heavy chemical resistant gloves (neoprene or butyl) , especially if hands will be immersed. See the chemical glove compatibility chart to choose appropriate chemical resistant gloves specific to the chemical being used •Flame resistant lab coat •Chemical resistant apron •Chemical splash goggles •Face shield •Heavy chemical resistant gloves (neoprene, butyl, or flame resistant). See the chemical glove compatibility chart to choose appropriate chemical resistant gloves specific to the chemical being used •Flame resistant lab coat •Chemical resistant apron
☐	hazardous chemicals, including organic mercury compounds CSL 4	skin damage Poisoning through skin contact	chemical fume hood, or local exhaust. If unavailable, a respirator may be required (contact EH&S) Inert atmosphere Trap or condense gases, vapors, and aerosols to avoid contaminating vacuum pumps or discharging large quantities to fume hood exhaust air Use designated area	Research-specific training, and EH&S training Medical surveillance may be required depending on quantity, toxicity, and frequency of exposure Practice before working with live material Inform nearby persons with a sign: “Toxic Compounds Use Area”	•Chemical splash goggles •Heavy chemical resistant gloves (neoprene or butyl). See the chemical glove compatibility chart to choose appropriate chemical resistant gloves specific to the chemical being used •Lab coat or gown

☐	Pressurized apparatus CSL 3,4	Eye or skin damage (lacerations due to shrapnel)	Chemical fume hood with sash lowered as much as possible Lexan or blast resistant shield	SOP, Research-specific training, and EH&S training	•Safety glasses or chemical splash goggles •Face shield (high risk) •Light chemical resistant and/or abrasion/puncture resistant gloves •Lab coat
☐	Potentially explosive materials, time sensitive, temperature sensitive, light sensitive, acid/base sensitive, metal ion sensitive, shock sensitive, or peroxide formers CSL 4	Eye or skin damage (lacerations due to shrapnel or burns) Fire	Chemical fume hood with sash lowered as much as possible Lexan or blast resistant shield (when more than 0.5g of explosive reactants are produced or 0.1g of explosive product is produced) Use Teflon-coated instead of ground glass fixtures for shock or friction sensitive materials	Peer-reviewed SOP, Research-specific training, and EH&S training Inform nearby persons with a sign: "Potentially Explosive Compounds Use Area" Practice before working with live material	•Chemical splash goggles •Face shield •Heavy chemical resistant gloves (neoprene, butyl, or flame resistant) or leather work gloves/welding gauntlets that extend past the wrist See the chemical glove compatibility chart to choose appropriate chemical resistant gloves specific to the chemical being used •Heavy work apron •Flame resistant lab coat

Biological Hazards

Check if applicable	Activity	Potential Hazard	Engineering Controls	Administrative Controls	Recommended PPE
☐	Working with human blood, body fluids, tissues, or bloodborne pathogens (BBP), animal specimens (preserved and unpreserved), or recombinant DNA Work with agents that are not known to consistently cause diseases in healthy adults. (BSL-1)	Exposure to infectious material or preservatives. Eye or skin irritation.	Lab bench, sink	• Peer-reviewed written procedure (SOP) • Job-specific training • EH&S Lab & Research Safety Training • Biosafety Core Course • Follow standard microbiological practices	•Lab coats •Nitrile gloves •Safety glasses •Use goggles for splash protection. •Select glove protection for preserved specimens according to type of preservative used
☐	Agents associated with human disease (BSL-2)	Exposure to infectious material Routes of transmission include percutaneous injury, ingestion, mucous membrane exposure	Bio Safety Cabinets or other physical containments devices used for all manipulations of agents that can cause splashes or aerosols of infectious materials.	Peer-reviewed written procedure (SOP) Job-specific training EH&S Lab & Research Safety Training Biosafety Core Course Limited access, biohazard warning signs Sharps precautions	•Lab coats •Nitrile gloves •Face and eye protection, as needed

				Medical surveillance policies Autoclave must be available	
☐	Indigenous or exotic agents (BSL-3)	Exposure to infectious material May cause serious or potentially lethal disease through the inhalation route exposure	Bio Safety Cabinets or other physical containments devices used for all manipulations of agents that can cause splashes or aerosols of infectious materials. Facility requirements: •Physical separation from access corridors •Self-closing, double-door access •Exhausted air not recirculated •Negative airflow into laboratory •Entry through airlock or anteroom	EHS lab & research safety course, Contact USF Biosafety Officer Hand washing sink near laboratory exit	•Lab coats •Nitrile gloves •Face and eye protection, as needed

Physical Hazards

Check if applicable	Activity	Potential Hazard	Engineering Controls	Administrative Controls	Recommended PPE
☐	Working with cryogenics	Major skin, tissue, or eye damage	Store and work with material in a laboratory or laboratory support areas with adequate air exchanges.	• Peer-reviewed written procedure (SOP) • Safety Data Sheets (SDS) • Job-specific training • EH&S Lab and Research training • Oxygen monitor if greater than 60 gallons of liquid nitrogen	• Safety glasses or goggles for large volumes • Heavy impermeable insulated gloves; lab coat • Consider a face shield
☐	Working with very cold equipment or dry ice	Frostbite, Hypotherm ia	• Work with material or equipment in a laboratory or laboratory support areas with adequate air exchanges. • Allow dry ice to sublimate in certified fume hood or glove box	• Peer-reviewed written procedure (SOP) • Safety Data Sheets (SDS) • Job-specific training • EH&S Lab and Research training • Do not store dry ice in cold rooms	• Safety glasses or goggles for large volumes Insulated gloves (possibly warm clothing) • Lab coat
☐	Working with hot liquids, equipment, or open flames (autoclave, Bunsen burners, water or oil bath)	Burns resulting in skin or eye damage	Work with material in a laboratory or laboratory support areas with adequate air exchanges.	• Peer-reviewed written procedure (SOP) • Job-specific training • EH&S Lab and Research training • Use & maintain equipment as per manufactures guide • Do not use mercury containing thermometers	• Safety glasses or goggles for large volumes • Insulated gloves (impermeable insulated gloves for liquids, steam) • Lab coat

☐	Extreme temperature during field activities	• Sunburn, heat stroke, dehydration • Hypothermia, frostbite	• Provide air-conditioned/ heated area for rest breaks • Consider fans, tents, umbrellas, chemical heat packs • Always have fluids available	• Peer-reviewed written procedure (SOP)	• Provide air-conditioned/ heated area for rest breaks • Consider fans, tents, umbrellas, chemical heat packs • Always have fluids available
☐	Nonhazardous material compressed gas cylinders	Uncontrolled pressure release can cause personal injury or property damage	• Store and work with material in a laboratory or laboratory support areas with adequate air exchanges • Secure compressed gas cylinders to a wall or bench by using a mounting bracket	• Peer-reviewed written procedure (SOP) • Job-specific training • EH&S Lab and Research training • Keep regulators in good condition • Cap cylinders that are not in use or attached to equipment • Keep upright	Safety glasses should be worn when operating a regulator or when using compressed air for cleaning/dusting
☐	Working with hazardous compressed gas cylinders (flammable, toxic, highly toxic, corrosive, air reactive, pyrophoric, those without good physiological warning properties)	Uncontrolled pressure release can cause personal injury or property damage; Fire or explosion; poisoning; severe respiratory, eye, and skin irritation	• Store and work with material in a laboratory or laboratory support areas with adequate air exchanges. • Secure compressed gas cylinders to a wall or bench mounted bracket. • Use and store in a certified chemical fume hood or vented gas cabinet.	• Peer-reviewed written procedure (SOP) • Job-specific training • EH&S Lab and Research training • Keep regulators in good condition • Cap cylinders that are not in use or attached to equipment • Use a gas detection and alarm system • Purchase the lowest concentration of the gas as possible	Safety glasses should be worn when operating a regulator or when using compressed air for cleaning/dusting

☐	Working with loud equipment, noises, sounds, or alarms, etc.	Potential ear damage and hearing loss	• Lubricate machinery and equipment • Place a barrier between the noise source and employee (i.e. sound walls or curtains) • Consider vibration isolation system.	Peer-reviewed written procedure (SOP) Job-specific training EH&S Hearing Conservation Training Limit workers' exposures through techniques such as job-rotation Operate noisy machines during times when fewer people are exposed Restrict worker presence to a suitable distance	Earplugs or ear muffs in consultation with EH&S Occupational Safety
☐	Glassware, needles, sharp metal or plastic edges	Laceration, injection, exposure	Use rubber mats in sinks to protect glassware Use "safer" sharps	• Peer-reviewed written procedure (SOP) • Job-specific training • Use plastic disposables	• Heavy rubber gloves for glassware washing • Cut-resistant gloves when handling sharps • Lab coat
☐	Working with electrical equipment (exposed electrical conductors, high voltage circuits, energized equipment)	Electrical shock		• Develop & follow task specific SOPs • Signs and postings notifying others of the hazard present • Inspect power cords prior to use	• Safety glasses • Protective gloves

☐	Harmful dusts, fumes, mists or vapors	Inhalation, lung damage, eye irritation	• Work with material or equipment in a laboratory or laboratory support areas with adequate air exchanges • Local exhaust ventilation	Peer-reviewed written procedure (SOP) Job-specific training EH&S Lab and Research training or EH&S Shop Safety or EH&S Safety and Compliance in the Arts	• Safety goggles • Respirator after consultation with EH&S Industrial Hygiene
☐	Manipulation of large objects (lifting)	Back injury Crush injury	Use carts and mechanical hoists Install conveyor belts and machines that move objects	• EH&S Back Safety Training • Proper lifting technique; bend knees	Back support

Radiological Hazards

Check if applicable	Activity	Potential Hazard	Engineering Controls	Administrative Controls	Recommended PPE
☐	Working with any radioactive materials requires prior approval by USF's radiation safety officer – 813-974-1194	Cell damage, potential spread of radioactive materials	Contact USF Radiation Safety Officer	Contact USF Radiation Safety Officer	Contact USF Radiation Safety Officer
☐	Working with radiation producing equipment (X-ray devices) requires prior approval by USF's radiation safety officer – 813-974-1194	Cell damage.	Contact USF Radiation Safety Officer	Contact USF Radiation Safety Officer	Contact USF Radiation Safety Officer
☐	Working with ultraviolet radiation	Skin cancer, conjunctivitis, corneal damage, skin redness	Enclosures, screens or filters used to contain the UV radiation. Devices such as interlocks to allow safe temporary access to a hazardous area. Surfaces should be painted in a dark, dull color.	SOP, Research-specific Training, EHS training, 4 hour training course, Warning Signs, limited access and exposure time. Complete application for use	•Safety glasses or chemical splash goggles •UV face shield •Lab coat
☐	Working with infrared emitting equipment (i.e. glass blowing)	Cataracts, burns to cornea	Adequate Ventilation	SOP, Research-specific Training, EHS training, 4 hour training course, Warning Signs, limited access and exposure time. Complete application for use	•Appropriate shaded safety goggles •Lab coat

Laser Hazards

Check if applicable	Activity	Potential Hazard	Engineering Controls	Administrative Controls	Recommended PPE
☐	Performing alignment, trouble-shooting or maintenance that requires working with an open beam and/or defeating the interlock(s) on any Class 3 of Class 4 laser system All class 3b and 4 lasers must be registered with USF's laser safety officer 813-974-1194	Eye and/or skin damage	Enclosures to limit access to laser beam	Follow requirements in the USF Laser Safety Program – available on-line. Warning Signs, limited access and exposure time.	•Proper Laser Safety glasses •impermeable gloves •Lab coat
☐	Viewing a Class 3R laser beam with magnifying optics (including eyeglasses)	Eye damage	Enclosures to limit access to laser beam	Follow requirements in the USF Laser Safety Program – available on-line. Warning Signs, limited access and exposure time.	Proper Laser Safety glasses

Laser System Non-Beam Hazards

☐	Handling dye and other laser-related materials such as chemicals and solvents.	Adverse health effects due to toxicity from inhalation or skin absorption, explosion, fire	Adequate ventilation, chemical fume hood, or local exhaust. If unavailable, a respirator may be required (contact EH&S).	• Follow requirements in the USF Laser Safety Program - available online • EH&S Lab and Research Safety training • Warning signs for use	•Appropriate shaded safety goggles •Lab coat

☐	Laser high voltage supplies	Electrocution	Use properly grounded equipment and tools	• Peer-reviewed written procedure (SOP) • Job-specific training • USF Laser Safety Training • Make sure area is dry • Connect to power last • Warning signs • Limited access and exposure time	Remove metal watches and jewelry
☐	Laser systems used to cut or etch materials. These lasers may have potential to generate a fire hazard. Laser beam may generate air contaminants.	Adverse health effects due to toxicity from inhalation explosion, fire	Ventilation/exhaust at laser work area, follow fire safety – access to fire extinguisher	SOP, Research-specific Training, EHS training, 4 hour training course, Warning Signs, limited access and exposure time. Complete application for use	•Use properly grounded equipment and tools • remove metal from body

Nanomaterial Hazards

Check if applicable	Activity	Potential Hazard	Engineering Controls	Administrative Controls	Recommended PPE
☐	Handling nanomaterial in a bound substrate or matrix; water-based liquid suspensions or gels. Non-destructive handling of nanomaterial. No potential for airborne release when handling.	Inhalation, ingestion, ocular, and dermal exposure are possible. Acute irritation and chronic respiratory illness are possible.	• Local exhaust ventilation • Certified chemical hood (with HEPA-filtered exhaust) • HEPA-filtered exhausted enclosure (Glove box) • Biological safety cabinet class II type A1, A2, vented via thimble connection, or B1 or B2	• Peer-reviewed written procedure (SOP) • Job-specific training EH&S Lab & Research Safety • Training Maintain a clean work area by using wet wiping method or vacuum with HEPA filtration after each use • Limit workers' exposures by using job-rotation schedules	• Safety glasses with side shields • Laboratory coat • Disposable gloves to match any associated chemical hazards
☐	Handling nanomaterial in powder of pellet form, in volatile liquid suspensions or gels. Heating materials, stirring or agitating liquid suspensions or gels, weighing or transferring powders or	Inhalation, ingestion, ocular, and dermal exposure are possible. Acute irritation and chronic respiratory illness are possible.	• Local exhaust ventilation • Certified chemical hood (with HEPA-filtered exhaust) • HEPA-filtered exhausted enclosure (Glove box) • Biological safety cabinet class II type A1, A2, vented via thimble connection, or B1 or B2	• Peer-reviewed written procedure (SOP) • Job-specific training EH&S Lab & Research Safety Training • Maintain a clean work area by using wet wiping method or vacuum with HEPA filtration after each use Limit workers'	• Safety goggles • Laboratory coat made from non-woven fibers • Disposable shoe covers • Disposable gloves to match any associated chemical hazards

	pellets. Moderate potential for release into air during handling.			exposures by using job-rotation schedules	
☐	Generation or manipulation nanomaterial in a powder or gaseous phase with high potential for airborne release.	Inhalation, ingestion, ocular, and dermal exposure are possible. Acute irritation and chronic respiratory illness are possible.	• Glove box or other sealed enclosure with HEPA-filtered exhaust. • Appropriate equipment for monitoring toxic gas (e.g., CO)	Peer-reviewed written procedure (SOP) Job-specific training EH&S Lab & Research Safety Training Maintain a clean work area by using wet wiping method or vacuum with HEPA filtration after each use Limit workers' exposures by using job-rotation schedules	• Safety goggles • Laboratory coat made from non-woven fibers • Disposable shoe covers • Disposable gloves to match any associated chemical hazards • Respirator after consultation with EH&S Industrial Hygiene

Blank Hazard Control Worksheet

Activity	Potential Hazard	Engineering Controls	Administrative Controls	Recommended PPE

Section 2: Conduct PPE Training

PPE training consists of **lab specific training** conducted by the PI or designee. Documentation is required to indicate training has been conducted.

Step 1

The PI or designee assures that the employees have completed all applicable safety training courses and university classes.

Step 2

a. The PI, lab supervisor, or their designee reviews the **completed *Lab PPE Assessment Tool*** (this document) with the person that will conduct the experiment. It describes the tasks in the lab when personnel need PPE to protect themselves from exposure to hazards. In this step, the hazard assessment is used as a training tool.

b. While discussing lab activities and the associated hazards with lab personnel, the PI or designee 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 PI or designee should also discuss general PPE safety practices, including not wearing PPE outside of lab hazard areas (e.g. hallways and eating areas).

c. Each member of the research lab will sign below acknowledging that they have reviewed the PPE assessment tool.

Step 3

Conduct and document refresher training whenever the hazard assessment is updated.

PPE Hazard Assessment Tool Training Acknowledgement: ***I have read, asked questions, and understand the PPE requirements for the activity/materials described herein.***

PI SIGNATURE/DESIGNEE		DATE
TRAINEES NAME		DATE

References

American Chemical Society. Identifying and Evaluating Hazards in Research Laboratories.: Guidelines Developed by the Hazards Identification and Evaluation Task Force of the American Chemical Society's Committee on Chemical Safety. 2013

American National Standards Institute ANSI Z49.1:2012 Safety in Welding, Cutting, and Allied Processes https://app.aws.org/technical/AWS_Z49.pdf

Hill, R. H. Jr.; Gaunce, J.A.; Whitehead, P. *Chemical Health and Safety* 1999, Jul-Aug, 7-14.

National Research Council. *Prudent Practices in the Laboratory: Evaluating Hazards and Assessing Risks in the Laboratory*, National Academy Press: Washington DC, 1995.

Univeristy of Arizona. Laboratory Chemical Safety Manual. Section 5. Particularly Hazardous Chemicals. (http://www.as.arizona.edu/safety) Accessed 3/6/2015.

University of California. Laboratory Hazard Assessment Tool. (https://ucla.app.box.com/ehs-ppe-selection-guide) Accessed 3/18/2015

Environmental Health and Safety 4202 E. Fowler Ave. OPM 100

Tampa, FL 33620

(813) 974-4036

http://www.usf.edu/eh&s/