EHS
HUNTER COLLEGE
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Laboratory Hazard Assessment for PPE Use

Review your laboratories specific procedures, processes, and chemical usage to determine level of Personal Protective Equipment

Chemical Hazards

Activity	Potential Hazard	Applicable PPE
Working with small volumes (<4 liters) of corrosive liquids	Eye or skin damage	Safety glasses or goggles. Light chemical-resistant gloves. Lab coat
Working with large volumes (>4 liters) of corrosive liquids, small to large volumes of acutely toxic corrosives, or work that creates splash hazards[1]	Poisoning; increased potential for eye and skin damage	Safety goggles. Heavy 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. Light chemical-resistant gloves. Lab coat
Working with large volumes (>4 liters) of organic solvents, small to large volumes of very dangerous solvents, or work that creates splash hazards[1]	Major skin or eye damage, potential poisoning through skin contact. Fire	Safety goggles. Heavy chemical-resistant gloves. Flame-resistant lab coat
Working with toxic or hazardous chemicals (solid, liquid, or gas)[1,2]	Skin or eye damage, potential poisoning through skin contact	Safety glasses (goggles for large quantities). Light chemical-resistant gloves. Lab coat
Working with acutely toxic or hazardous chemicals (solid, liquid, or gas)[1, 2, 3]	Increased potential for eye or skin damage; increased potential poisoning through skin contact	Safety goggles. Heavy 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. Chemical-resistant apron for high-risk activities
Working with potentially explosive chemicals	Splash, detonation, flying debris, skin and eye damage. Fire	Safety glasses face shield, and blast shield. Heavy gloves. Flame-resistant lab coat
Working with low and high temperatures	Burns; frostbite; splashes. Fire	Safety glasses. 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

Biological Hazards

Activity	Potential Hazard	Applicable PPE
Working with human blood, body fluids, tissues, or bloodborne pathogens (BBP)[5]	Exposure to infectious material	Safety goggles with face shield or facemask plus goggles, latex or nitrile gloves, lab coat or gown
Working with preserved 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 radioactive human blood, body fluids, or bloodborne pathogens (BBP)	Cell damage, potential spread of radioactive contaminants, or potential BBP exposure	Safety glasses (goggles for splash hazard), light latex or nitrile gloves (double), 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)[4]	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, ABL-1)[7]	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 using wire mesh glove
Working with live animals (Animal Biosafety Level 2, ABL- 2) [5,7]	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 using wire mesh glove

Radiological Hazards

Activity	Potential Hazard	Applicable PPE
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
Working with ultraviolet radiation	Conjunctivitis, corneal damage, skin redness	UV Safety glasses
Working with infrared emitting equipment (e.g. glass blowing)	Cataracts, burns to cornea	UV face shield and goggles, lab coat
Working with X-Rays	Cell damage	Appropriate shaded goggles, lab coat

Laser Hazards

Activity	Potential Hazard	Applicable PPE
Performing alignment, trouble-shooting or maintenance that requires working with an open beam and/or defeating the interlock(s) on any Class 3 or Class 4 laser system	Eye damage	Appropriately shaded goggles/glasses with optical density based on individual beam parameters
Viewing a Class 3R laser beam with magnifying optics (including eyeglasses)	Eye damage	Appropriately shaded goggles/glasses with optical density based on individual beam parameters
Working with a Class 3B laser open beam system with the potential for producing direct or specular reflections	Eye damage, skin damage	Appropriately shaded goggles/glasses with optical density based on individual beam parameters, appropriate skin protection
Working with a Class 4 laser open beam system with the potential for producing direct, specular, or diffuse reflections	Eye damage, skin damage	Appropriately shaded goggles/glasses with optical density based on individual beam parameters, appropriate skin protection
Non Beam		
Handling dye laser materials, such as powdered dyes, chemicals, and solvents	Cancer, explosion, fire	Gloves, safety glasses, flame resistant lab coat or coveralls
Maintaining and repairing power sources for large Class 3B and Class 4 laser systems	Electrocution, explosion, fire	Electrical isolation mat, flame- resistant lab coat or coveralls

Physical Hazards

Activity	Potential Hazard	Applicable PPE
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.	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)[1]	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. Earplugs or ear muffs as necessary
Working with sharps	Cuts, exposure	Safety glasses or goggles, lab coat, latex, vinyl, or nitrile gloves

1. Use a chemical fume hood or other engineering control whenever possible. Activities not conducted inside a chemical fume hood should be evaluated to determine if the activity presents a respiratory hazard. In this case a respirator may be required. Contact EHS for more information. In addition to engineering controls and PPE, consider personal clothing that provides adequate skin coverage.
2. Review Safety Data Sheets (SDS) for chemical-specific safety information.
3. Chemical-resistant gloves are to be selected based on the specific chemical(s) used.
4. Work in Biosafety cabinet to minimize exposure.
5. Appropriate skin protection can include lab coat, gloves, and apron.