

Laboratory Hazard Assessment Tool

This Laboratory Hazard Assessment Tool facilitates the identification of hazards and appropriate Personal Protective Equipment (PPE) to ensure the safety of lab personnel during work activities. The LHAT must be updated as hazards and personnel change, and at least once every 12 months, irrespective of changes to hazards or personnel.

This tool is based on a model developed and used at the UCLA campus.

Activity Hazard Assessment

In this section, you will:

- Conduct a hazard assessment of this lab group to identify activities when PPE is needed to protect the lab personnel;
- Certify the hazard assessment for the laboratory.

Note: In all cases chemical splash goggles can be substituted for safety glasses. For splash or impact protection, either safety goggles or safety glasses respectively need to be worn under face shields.

The final assessment report will identify PPE applicable to each hazard identified in the lab. **For activities that are described in a laboratory specific SOP or for activities where a Use Authorization(s) (UA) has been issued by a campus safety committee, the PPE specified in that SOP/UA shall take precedence.**

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Activity performed		All Laboratories			
		<input type="checkbox"/> Laboratory has been approved and posted as free of physical or chemical hazards Skip all other sections.			
Yes	No	Activity in lab	Potential Hazard	Active Researcher Attire (direct manipulation)	Adjacent Individuals Attire
<input type="checkbox"/>	<input type="checkbox"/>	E01. Entering laboratory	Many	<ul style="list-style-type: none"> ✓ Long pants or equivalent ✓ Closed-toed/heel shoes ✓ Long hair tied back <p>Note: Tights & panty hose are considered undergarments</p>	All personnel in laboratory room: <ul style="list-style-type: none"> ✓ Long Pants ✓ Closed toed/heel shoes

Full length pants (or equivalent), and closed toe/heel shoe attire must be worn at all times by all individuals who are occupying or entering a laboratory/technical area.

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Activity performed		Chemical Hazards			
Yes	No	Activity in lab	Potential Hazard	Active Researcher PPE (Direct Manipulation)	Adjacent Individuals PPE
<input type="checkbox"/>	<input type="checkbox"/>	C01. Working with small volumes (less than 5 ml) of corrosive (e.g. acids, caustics, etc.) liquids or solids.	Eye or skin damage. Low probability for a splash hazard.	<ul style="list-style-type: none"> ✓ Safety glasses ✓ Chemical-resistant gloves 	All personnel in laboratory room: <ul style="list-style-type: none"> ✓ Safety glasses
<input type="checkbox"/>	<input type="checkbox"/>	C02. Working with corrosive or acutely toxic liquids or other materials which creates a splash hazard.	Poisoning, increased potential for eye and skin damage.	<ul style="list-style-type: none"> ✓ Safety goggles ✓ Chemical-resistant gloves ✓ Lab coat <u>or</u> ✓ Chemical-resistant apron 	All personnel in laboratory room: <ul style="list-style-type: none"> ✓ Safety goggles ✓ Lab coat <u>or</u> ✓ Chemical-resistant apron
<input type="checkbox"/>	<input type="checkbox"/>	C03. Working with small volumes of flammable solvents/materials when no reasonable ignition sources are present.	Skin or eye damage, potential poisoning through skin contact.	<ul style="list-style-type: none"> ✓ Safety goggles ✓ Chemical-resistant gloves ✓ Lab coat 	All personnel in laboratory room: <ul style="list-style-type: none"> ✓ Safety goggles In adjacent area within 20 feet: <ul style="list-style-type: none"> ✓ Lab coat
<input type="checkbox"/>	<input type="checkbox"/>	C04. Working with flammable materials (including solvents): When using a large quantity; or, any quantity when there is a risk of ignition; or, areas where flammable vapors or gas are may be present.	Major Fire. Major skin or eye damage, potential poisoning through skin contact.	<ul style="list-style-type: none"> ✓ Safety goggles ✓ Chemical-resistant gloves ✓ NFPA 2112 rated Flame-Resistant (FR) lab coat 	All personnel in laboratory room: <ul style="list-style-type: none"> ✓ Safety goggles In adjacent area within 20 feet: <ul style="list-style-type: none"> ✓ Lab coat <u>or</u> ✓ NFPA 2112 rated Flame-Resistant (FR) lab coat
<input type="checkbox"/>	<input type="checkbox"/>	C05. Working with toxic or hazardous chemicals (solid, liquid, or gas). (including but not limited to GHS H301, H302, H311, H312, H331 H332)	Skin or eye damage, potential poisoning through skin contact.	<ul style="list-style-type: none"> ✓ Safety goggles ✓ Chemical-resistant gloves ✓ Lab coat 	All personnel in laboratory room: <ul style="list-style-type: none"> ✓ Safety goggles ✓ Lab coat
<input type="checkbox"/>	<input type="checkbox"/>	C06. Working with Acutely Toxic Chemicals. (GHS H300, H310, H330)	Spills, splashes, ingestion, inhalation, absorption. Chemicals pose a high level of immediate health risk.	<ul style="list-style-type: none"> ✓ Safety goggles ✓ Chemical resistant gloves ✓ Lab coat (plus chemical protective apron for H330) 	All personnel in laboratory room: <ul style="list-style-type: none"> ✓ Safety goggles ✓ Lab coat
<input type="checkbox"/>	<input type="checkbox"/>	C07. Working with an apparatus with contents under pressure or vacuum.	Eye or skin damage.	<ul style="list-style-type: none"> ✓ Safety goggles ✓ Face shield (for high risk activities) ✓ Chemical-resistant gloves ✓ Lab coat ✓ Chemical-resistant apron (for high risk activities) 	All personnel in laboratory room: <ul style="list-style-type: none"> ✓ Safety goggles ✓ Lab coat

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Activity performed		Chemical Hazards			
Yes	No	Activity in lab	Potential Hazard	Active Researcher PPE (Direct Manipulation)	Adjacent Individuals PPE
<input type="checkbox"/>	<input type="checkbox"/>	C08. Working with pyrophoric (air reactive) chemicals or chemicals that in contact with water releases flammable gasses (water reactive). (GHS H25x and H26x)	Severe skin and eye damage. Fire.	For work outside glove boxes: ✓ Safety goggles ✓ Face shield ✓ FR rated outer gloves ✓ Chemical-resistant inner gloves ✓ NFPA 2112 Flame Resistant (FR) lab coat. Work in inert atmosphere when possible.	All personnel in laboratory room: ✓ Safety goggles In adjacent area within 20 feet: ✓ Lab coat or ✓ NFPA 2112 rated Flame-Resistant (FR) lab coat
<input type="checkbox"/>	<input type="checkbox"/>	C09. Working with potentially explosive chemicals. (e.g. Nitrates, Perchlorates, Azides, Nitrites etc.) Using in a reaction, not as a dilute solution or preservative.	Splash, detonation, flying debris, skin and eye damage, fire.	✓ Safety goggles ✓ Face shield, and/or use blast shield ✓ Chemical-resistant gloves ✓ NFPA 2112 Flame Resistant (FR) lab coat	All personnel in laboratory room: ✓ Safety goggles ✓ NFPA 2112 Flame Resistant (FR) lab coat
<input type="checkbox"/>	<input type="checkbox"/>	C10. Minor chemical spill cleanup	Skin or eye damage, respiratory damage.	✓ Safety goggles ✓ Chemical-resistant gloves ✓ Chemical-resistant apron or Lab coat	All personnel in laboratory room: ✓ Safety goggles ✓ Lab coat
<input type="checkbox"/>	<input type="checkbox"/>	C11. Major chemical spill cleanup	Multiple hazards.	Call for EH&S assistance	All personal evacuate lab
<input type="checkbox"/>	<input type="checkbox"/>	C12. Working with known or suspect human carcinogens (GHS H350, H351)	Spills, splashes, ingestion, inhalation, absorption. High hazard cancer-causing agents.	✓ Safety goggles ✓ Chemical-resistant gloves ✓ Lab coat	All personnel in laboratory room: ✓ Safety goggles ✓ Lab coat
<input type="checkbox"/>	<input type="checkbox"/>	C13. Working with reproductive hazards (GHS H340, H341, H360, H361)	Spills, splashes, ingestion, inhalation, absorption. Agents that affect reproductive capabilities, cause mutation and adversely affect fetal development.	✓ Safety goggles ✓ Chemical-resistant gloves ✓ Lab coat	All personnel in laboratory room: ✓ Safety goggles ✓ Lab coat

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Activity performed		Chemical Hazards			
Yes	No	Activity in lab	Potential Hazard	Active Researcher PPE (Direct Manipulation)	Adjacent Individuals PPE
<input type="checkbox"/>	<input type="checkbox"/>	C14. Working with engineered nanomaterials.	Inhalation, exposure, dermal exposure.	<ul style="list-style-type: none"> ✓ Chemical Splash goggles ✓ Chemical-resistant gloves ✓ Lab coat 	All personnel in laboratory room: <ul style="list-style-type: none"> ✓ Safety goggles ✓ Lab coat

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Activity performed		Physical Hazards			
Yes	No	Activity in lab	Potential Hazard	Active Researcher PPE (Direct Manipulation)	Adjacent Individuals PPE
<input type="checkbox"/>	<input type="checkbox"/>	P01. Working with cryogenic liquids.	Major skin, tissue, or eye damage.	<ul style="list-style-type: none"> ✓ Safety goggles (goggles for large volumes) ✓ Cryogenic protective gloves ✓ Lab coat 	All personnel in laboratory room: ✓ Safety glasses
<input type="checkbox"/>	<input type="checkbox"/>	P02. Removing freezer vials from liquid nitrogen.	Vials may explode upon rapid warming. Cuts to face/neck and frostbite to hands.	<ul style="list-style-type: none"> ✓ Safety goggles ✓ Face shield ✓ Cryogenic protective gloves ✓ Lab coat 	All personnel in laboratory room: ✓ Safety glasses
<input type="checkbox"/>	<input type="checkbox"/>	P03. Working with very cold equipment or dry ice.	Frostbite, hypothermia.	<ul style="list-style-type: none"> ✓ Safety goggles ✓ Cryogenic protective gloves ✓ Lab coat (possibly warm clothing) 	All personnel in laboratory room: ✓ Safety glasses
<input type="checkbox"/>	<input type="checkbox"/>	P04. Working with scalding liquids or hot equipment (e.g. autoclave, water bath, oil bath).	Burns resulting in skin or eye damage.	<ul style="list-style-type: none"> ✓ Safety goggles ✓ Thermal protective gloves (impermeable insulated gloves for liquids and steam) ✓ Lab coat 	All personnel in laboratory room: ✓ Safety glasses
<input type="checkbox"/>	<input type="checkbox"/>	P05. Glassware washing.	Lacerations, chemical splash.	<ul style="list-style-type: none"> ✓ Safety goggles ✓ Heavy rubber gloves ✓ Lab coat 	All personnel in laboratory room: ✓ Safety glasses
<input type="checkbox"/>	<input type="checkbox"/>	P06. Working with loud equipment, noises, sounds, alarms, etc.	Potential ear damage and hearing loss.	<ul style="list-style-type: none"> ✓ Earplugs or ear muffs as necessary 	✓ Earplugs or ear muffs as necessary
<input type="checkbox"/>	<input type="checkbox"/>	P07. Working with a centrifuge.	Imbalanced rotor can lead to broken vials, cuts, exposure.	<ul style="list-style-type: none"> ✓ Safety glasses or goggles* ✓ Disposable gloves ✓ Lab coat 	All personnel in laboratory room: ✓ Safety glasses or goggles* ✓ Lab coat
<input type="checkbox"/>	<input type="checkbox"/>	P08. Working with a sonicator.	Ear damage, exposure.	<ul style="list-style-type: none"> ✓ Safety glasses or goggles* ✓ Disposable gloves ✓ Earplugs or ear muffs as necessary ✓ Lab coat 	All personnel in laboratory room: ✓ Safety glasses or goggles* ✓ Lab coat

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Activity performed		Physical Hazards			
Yes	No	Activity in lab	Potential Hazard	Active Researcher PPE (Direct Manipulation)	Adjacent Individuals PPE
<input type="checkbox"/>	<input type="checkbox"/>	P09. Working with sharps (e.g. needles and razor blades.)	Cuts, exposure.	<ul style="list-style-type: none"> ✓ Safety glasses or goggles* ✓ Cut resistance gloves ✓ Lab coat 	All personnel in laboratory room: <ul style="list-style-type: none"> ✓ Safety glasses or goggles* ✓ Lab coat

* Safety goggles must be worn when there is a risk of chemical splash. Sufficient protection against liquid splash is provided by ANSI Z87.1 (or Z87+) rated goggles, not safety glasses. Goggles that are vented must be indirectly vented to provide adequate splash protection.

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Guideline to Defining Hazardous Materials:

Hazardous materials may be described using the following characteristics or regulatory definitions. This list is to be used as a guideline and allows for some laboratory/ technical areas to be classified as non-hazardous materials areas. It does not supersede Cal/OSHA regulations or accepted safe work practices for specific materials. The container label and the Safety Data Sheet for the material should be consulted to determine the hazard classification(s) of a particular substance.

- a) Corrosives. Any chemical that causes visible destruction of, or irreversible alterations in, living tissue at the site of contact. *Examples: hydrochloric acid, sulfuric acid, sodium hydroxides, potassium hydroxides.*
- b) Materials recognized as readily absorbed through the skin. *Examples: phenol, THF, DMSO, benzene, carbon disulfide, toluene.*
- c) Skin or eye irritants are chemicals which are not corrosive, but which cause a reversible inflammatory effect on living tissue by chemical action at the site of contact. *Examples: xylenes, formamide, many amines like triethanolamine, carbon tetrachloride, perchloroethylene, many inorganic salts like cobalt and nickel sulfate.*
- d) Flammable liquids having a flash point not more than 93°C. *Examples: organic solvents, ethers, alcohols, toluene, pentane, acetone.*
- e) Violently air-reactive or water-reactive chemicals, including pyrophorics (substances that spontaneously ignite in air). *Examples: sodium or potassium metal, diethyl zinc, lithium aluminum hydride, t-butyl lithium, aluminum alkyls, calcium carbide, phosphine.*
- f) Carcinogens or Mutagens. *Examples: formaldehyde, dichloromethane, benzene, chloroform.*
- g) Reproductive Hazards. *Examples: acrylamide, Cd, Pb, Hg, Cr(VI), carbon disulfide, toluene, chloroform, ethylene glycol ethers.*
- h) Toxic or Highly Toxic Chemical. A material likely to be fatal or toxic if inhaled, ingested or by skin contact.
- i) Oxidizing Agents. A material not necessarily combustible, but may, generally by yielding oxygen, cause or contribute to the combustion of other material. *Examples: nitric and perchloric acids, chromates, nitrates, nitrites, hydrogen peroxide, chlorates.*
- j) Any unsealed radioactive material.
- k) Biological materials classified as Risk Group 2, or greater.
- l) Centers for Disease Control Select Agent Toxin