This Laboratory Hazard Assessment Tool (LHAT) facilitates 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. The LHAT will provide a summary report of hazards present in the laboratory and PPE recommended for laboratory workers.

Objectives for the Principal Investigator (PI)\*:

* Identify hazards that are present in the lab
* Communicate lab hazards to personnel
* Identify what PPE is needed based on the hazard assessment
* Provide PPE training to lab personnel
* Maintain records of PPE assessment and training

Objectives for Lab Personnel:

* Receive information about hazards present in the lab
* Receive information about PPE needed to work in the lab
* Receive training on the necessary PPE

\*For the purposes of this LHAT, all Faculty Principal Investigators, Chemical Hygiene Officers, Laboratory Supervisors, Department Laboratory Coordinators, Laboratory Managers, Instrumentation Laboratory Supervisors and Laboratory Administrators will be called “Principal Investigators”.

The PI should conduct hazard assessments specific to activities in their laboratories at least once each calendar year. The Laboratory Hazard Assessment Tool identifies hazards to personnel and specifies personal protective equipment (PPE) to protect employees during work activities. The person conducting the assessment must verify at that end that it is complete and reflective of activities in their laboratories.

EHS personnel are available to assist with completing the Hazard Assessment form or with reviewing it once it has been completed. EHS may also be consulted for specific questions regarding PPE requirements.

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| **Principal Investigator:** |  | |
| **Department:** |  | |
| **Principal Investigator phone:** |  | |
| **Principal Investigator email:** |  | |
| **Laboratory Safety Contact:** |  | |
| **Laboratory Safety Contact phone:** |  | |
| **Laboratory Safety Contact email:** |  | |
| **Laboratory name:** |  | |
| **Laboratory Locations: building(s) / room(s):** |  |  |
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The majority of PIs will only have one laboratory, which may encompass multiple rooms, but in rare cases PIs may have multiple laboratories with substantially different hazards (e.g., nanofabrication and biological testing laboratories). In these cases, the PI must have separate hazard assessments for each laboratory.

# Activity Hazard Assessment

In this section, the Principal Investigator will:

* Conduct a hazard assessment of this laboratory to identify activities when PPE is needed to protect the laboratory personnel
* Certify the hazard assessment for the laboratory

The final assessment report will summarize the PPE applicable for the hazards identified in the laboratory.

The LHAT is a PPE selection tool only; administrative and engineering controls for specific activities are contained in your laboratory specific or local SOPs.

For activities that are described in a laboratory-specific Standard Operating Procedure the PPE specified in that SOP/UA shall take precedence.

Under UNM Policy, full length pants (or equivalent) and closed-toed/closed-heel shoes must be worn at all times by all individuals who are occupying or entering a laboratory or technical area.

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| **All Laboratories**   * This laboratory has been approved and posted as free of physical or chemical hazards. Skip all other sections. | |
| **Active Researcher Attire**  **(direct manipulation)** | **Adjacent Individuals Attire** |
| * Long pants or equivalent * Closed-toed/closed-heel shoes   Note: Tights and panty hose are considered undergarments. | All personnel in laboratory room:   * Long pants or equivalent * Closed-toed/closed-heel shoes |

Note: The adjacent area flyover will read:

The distance (radius) for the adjacent area depends on the material hazards, the lab activity, and the lab configuration. Each laboratory can set distances according to their unique situation, but some examples of suggested distances are:

For pipetting small volumes (10 microliters) of acute toxins, the hazardous zone could be 1 meter.

For pouring small volumes (1 liter) of acidic solutions, the splash zone could be 2 meters.

For working with modest volumes (4 liters) of flammable

liquids, the flash fire zone could be 3 meters.

For working with materials under pressure, the hazardous zone could be 10 meters.

For working with explosives, the danger zone is the entire laboratory.

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| Activity performed | | **Chemical Hazards** | | | |
| **Yes** | **No** | **Activity in lab** | **Potential Hazards** | **Active Researcher PPE**  **(Direct Manipulation)** | **Adjacent Individuals PPE** |
|  |  | C01. Working with small volumes  (≤ 4L) of corrosive (e.g. acids, bases, etc.) liquids or solids | * Eye or skin damage * Low probability for a splash hazard | * Safety glasses * Chemical-resistant gloves * Lab coat | In adjacent area:   * Safety glasses * Lab coat |
|  |  | C02. Working with large volumes (>4L) of corrosive (e.g. acids, bases, etc.) liquids or solids | * Eye or skin damage. * Low probability for a splash hazard | * Safety glasses * Chemical-resistant gloves * Lab coat * Chemical-resistant apron | In adjacent area:   * Safety glasses * Lab coat |
|  |  | C03. Working with corrosive or acutely toxic liquids or other materials which create a splash hazard | * Potential for poisoning, increased potential for eye and skin damage | * Chemical splash safety goggles * Chemical-resistant gloves * Lab coat * Chemical-resistant apron | In adjacent area:   * Safety glasses * Lab coat |
|  |  | C04. Working with small volumes (≤ 1L) of flammable solvents/materials when no  reasonable ignition sources are present | * Skin or eye damage, potential for poisoning through skin contact | * Safety glasses * Chemical-resistant gloves * Lab coat | In adjacent area:   * Safety glasses * Lab coat |
|  |  | C05. Working with large volumes (> 1L) of flammable solvents/materials | * Major Fire * Major skin or eye damage, potential for poisoning through skin contact | * Safety glasses * Flame-resistant outer gloves * Chemical-resistant inner gloves * Flame-resistant lab coat (NFPA 2112) | In adjacent area:   * Safety glasses * Lab coat |
|  |  | C06. Working with any quantity of flammable materials (including solvents) when there is a risk of ignition; or areas where flammable vapors or gas may be present | * Major Fire * Major skin or eye damage, potential for poisoning through skin contact | * Safety glasses * Flame-resistant outer gloves * Chemical-resistant inner gloves * Flame-resistant lab coat (NFPA 2112) | All personnel in lab/room:   * Safety glasses * Flame-resistant lab coat (NFPA 2112) |
|  |  | C07. 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 for poisoning through skin contact | * Safety glasses (chemical splash goggles for large quantities) * Chemical-resistant gloves * Lab coat | In adjacent area:   * Safety glasses * Lab coat |

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| Activity performed | | **Chemical Hazards** | | | |
| **Yes** | **No** | **Activity in lab** | **Potential Hazards** | **Active Researcher PPE**  **(Direct Manipulation)** | **Adjacent Individuals PPE** |
|  |  | C08. Working with acutely toxic chemicals (GHS H300, H310, H330) | * Spills, splashes, ingestion, inhalation, absorption * Chemicals pose a high level of immediate health risk | * Safety glasses * Chemical-resistant gloves * Lab coat (plus chemical protective apron for H330) | All personnel in lab/room:   * Safety glasses * Lab coat |
|  |  | C09. Working with pyrophoric (air reactive) chemicals or chemicals that in contact with water release flammable gases (water reactive) (GHS H25x and H26x) | * Severe skin and eye damage * Fire | For work outside of glove boxes:   * Safety glasses * Face shield * FR-rated outer gloves * Chemical-resistant inner gloves * Flame-resistant lab coat (NFPA 2112)   Work in inert atmosphere when possible | All personnel in lab/room:   * Safety glasses * Flame-resistant lab coat (NFPA 2112) |
|  |  | C10. Working with potentially explosive chemicals (e.g., nitrates, perchlorates, azides, nitrites, etc.) | * Splash, detonation, flying debris, skin and eye damage, fire | * Safety glasses * Face shield, and/or use blast shield * Chemical-resistant gloves * Flame-resistant lab coat (NFPA 2112) | All personnel in lab/room:   * Safety glasses (or chemical splash goggles) * Flame-resistant lab coat (NFPA 2112) |
|  |  | C11. Working with known or suspect human carcinogens (GHS H350, H351) | * Spills, splashes, ingestion, inhalation, absorption * High hazard cancer-causing agents | * Safety glasses * Chemical-resistant gloves * Lab coat | In adjacent area:   * Safety glasses * Lab coat |
|  |  | C12. Working with reproductive toxins (GHS H340, H341, H360, H361) | * Spills, splashes, ingestion, inhalation, absorption * Agents that affect reproductive capabilities, cause mutation and adversely affect fetal   development | * Safety glasses * Chemical-resistant gloves * Lab coat | In adjacent area:   * Safety glasses * Lab coat |
|  |  | C13. Minor chemical spill cleanup | * Skin or eye damage, respiratory damage | * Safety glasses * Chemical-resistant gloves * Shoe covers * Chemical-resistant apron * Lab coat | In adjacent area:   * Safety glasses * Lab coat |

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| Activity performed | | **Chemical Hazards** | | | |
| **Yes** | **No** | **Activity in lab** | **Potential Hazards** | **Active Researcher PPE**  **(Direct Manipulation)** | **Adjacent Individuals PPE** |
|  |  | C14. Major chemical spill cleanup | * Multiple hazards | Call EHS for assistance | All personnel must evacuate lab |
|  |  | C15. Working with engineered nanomaterials | * Inhalation, exposure, dermal exposure | * Chemical splash goggles * Chemical-resistant gloves * Lab coat | All personnel in lab/room:   * Safety glasses * Lab coat |

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

**Note**: All chemical spills need careful evaluation for the hazards presented and course of action. “Minor” and “Major” chemical spills might be determined by the quantities of material spilled or the health hazard presented.

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| Activity performed | | **Physical Hazards** | | | |
| **Yes** | **No** | **Activity in lab** | **Potential Hazard** | **Active Researcher PPE**  **(Direct Manipulation)** | **Adjacent Individuals PPE** |
|  |  | P01. Working with cryogenic liquids | * Major skin, tissue, or eye damage | * Safety glasses (chemical splash goggles for large volumes) * Face shield * Cryogenic protective gloves * Lab coat | N/A |
|  |  | P02. Working with very cold equipment, dry ice or liquid nitrogen | * Frostbite, hypothermia | * Safety glasses * Cryogenic protective gloves * Lab coat (possibly warm clothing) | N/A |
|  |  | P03. Removing sealed vials from liquid nitrogen | * Vials may explode upon rapid warming * Cuts to face/neck and frostbite to hands | * Safety glasses * Face shield * Cryogenic protective gloves * Lab coat | N/A |
|  |  | P04. Working with scalding liquids or hot equipment (e.g., autoclave, water bath, oil bath) | * Burns resulting in skin or eye damage | * Safety glasses (chemical splash goggles for large volumes) * Thermal protective gloves (impermeable insulated gloves for liquids and steam) * Lab coat | N/A |
|  |  | P05. Glassware washing | * Lacerations, chemical splash | * Safety glasses * Chemical-resistant gloves * Lab coat | N/A |
|  |  | P06. Working with loud equipment, noises, sounds, alarms, etc. | * Potential ear damage and hearing loss | * Hearing protection (consult   EHS for SNR factor as needed) | * Hearing protection (consult   EHS for SNR factor as needed) |
|  |  | P07. Working with a centrifuge | * Imbalanced rotor can lead   to broken vials, cuts, exposure | * Safety glasses * Disposable gloves * Lab coat | N/A |
|  |  | P08. Working with a sonicator | * Ear damage, exposure | * Safety glasses * Disposable gloves * Hearing protection, as necessary (consult EHS for SNR factor as needed) * Lab coat | N/A |

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| Activity performed | | **Physical Hazards** | | | |
| **Yes** | **No** | **Activity in lab** | **Potential Hazard** | **Active Researcher PPE**  **(Direct Manipulation)** | **Adjacent Individuals PPE** |
|  |  | P09. Working with sharps (e.g. needles, razor blades, scalpels) | * Cuts, exposure | * Safety glasses * Cut-resistant gloves * Lab coat | N/A |
|  |  | P10. Working with an apparatus containing materials under pressure or vacuum | * Eye or skin damage | * Safety glasses * Face shield (for high risk activities) * Chemical-resistant gloves * Lab coat * Chemical-resistant apron (for high risk activities) | In adjacent area:   * Safety glasses * Lab coat |

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| Activity performed | | **Biological Hazards**   * The laboratory has a BUA that addresses all of these items. Skip to next section. | | | |
| **Yes** | **No** | **Activity in lab** | **Potential Hazard** | **Active Researcher PPE**  **(Direct Manipulation)** | **Adjacent Individuals PPE** |
|  |  | B01. Working with human or non- human primate blood, body fluids, tissues, cells or other potentially infectious material (OPIM) which may contain human bloodborne pathogens (BBP) | * Exposure to infectious material, sharps injuries | * Eye and mucous membrane protection (as appropriate for operations) * Disposable gloves * Disposable lab coat impervious to fluids | In adjacent area:   * Safety glasses * Lab coat |
|  |  | B02. Working with microbial agents (bacteria, virus, parasites, yeast, fungi, prions), recombinant DNA and/ or biological materials (cells, tissues, fluids) exposed to or likely to contain Risk Group 1 microbial agents or recombinant DNA (BSL-1) | * Eye irritation, sharps injury * Exposure of infectious material to those who may have personal health issues which make them more susceptible to infection; cross contamination of   animal or extra laboratory areas | * Safety glasses * Disposable gloves * Lab coat | In adjacent area:   * Safety glasses * Lab coat |
|  |  | B03. Working with microbial agents, recombinant DNA and/or biological materials (cells, tissues, fluids) exposed to or likely to contain Risk  Group 2 microbial agents or recombinant DNA (BSL-2) | * Exposure to infectious material, particularly through broken skin or mucous membranes, sharps injuries | * Safety glasses * Double layer of disposable gloves * Lab coat | All personnel in lab/room:   * Safety glasses * Lab coat |
|  |  | B04. Working with microbial agents, recombinant DNA and/or biological materials (cells, tissues, fluids) exposed to or likely to contain Risk Group 2 microbial agents or recombinant DNA for which Biosafety Level 3 practices are required (BSL-2+) | * Exposure to infectious materials with high risk of exposure by contact with skin or mucous membranes and/or other potential or unknown routes of entry and/or increased consequences of exposure * Sharps injuries | * Safety glasses * Double layer disposable gloves * Lab coat or disposable lab coat | All personnel in lab/room:   * Safety glasses * Lab coat or disposable lab coat |

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| Activity performed | | **Biological Hazards** | | | |
| **Yes** | **No** | **Activity in lab** | **Potential Hazard** | **Active Researcher PPE**  **(Direct Manipulation)** | **Adjacent Individuals PPE** |
|  |  | B05. Working with microbial agents, recombinant DNA and/or biological materials (cells, tissues, fluids) exposed to or likely to contain Risk Group 3 microbial agents or recombinant DNA (BSL-3) | * Exposure to infectious materials with high risk of exposure, particularly through the inhalation route | * Safety glasses * Double layer disposable gloves * Shoe cover or dedicated shoe * Bloodborne pathogen barrier coat or coveralls (preferred) | All personnel in lab/room:   * Respirator (N95 minimum, for some work a higher level may be required) * Safety glasses * Double layer disposable gloves * Disposable shoe covers or dedicated shoe * Bloodborne pathogen barrier coat or coveralls   (preferred) |
|  |  | B06. Working with live animals- alone or in conjunction with Risk Group 1 microbial agents or recombinant DNA (ASBL-1) | * Animal bites, allergies, eye irritation, sharps injury * Exposure of infectious material to those who may have personal health issues which make them more susceptible to infection; cross contamination of animal or extra laboratory   areas | * Safety glasses * Disposable gloves * Lab coat   Additional PPE (e.g. puncture-resistant gloves) may be required based on risk assessment by the IBC & IACUC. Additional gowning (shoe covers, face mask) may be required for animal welfare purposes. | All personnel in lab/room:   * Safety glasses * Lab coat |
|  |  | B07. Working with infected or potentially infectious live animals—alone or in conjunction with Risk Group 2 microbial agents or recombinant DNA (or materials exposed to RG-2 agents) (ABSL-2) | * Animal bites, exposure to infectious material, allergies, sharps injury | * Safety glasses * Disposable gloves * Bouffant/hair net * Lab coat   Additional PPE (e.g. puncture-resistant gloves) may be required based on risk assessment by the IBC & IACUC. Additional gowning (shoe covers, face  mask) may be required for animal welfare purposes. | All personnel in lab/room:   * Safety glasses * Bouffant/hair net * Lab coat |

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|  | | **Radiological Hazards**   * The laboratory has a RUA and/or MUA that addresses all of these. Skip to next section. | | | |
| **Yes** | **No** | **Activity in lab** | **Potential Hazard** | **Active Researcher PPE**  **(Direct Manipulation)** | **Adjacent Individuals PPE** |
|  |  | R01. Working with unsealed radioactive materials including generally licensed radioactive material or devices (e.g., uranyl acetate, uranyl nitrate, thorium,  nitrate) | * Cell damage, potential spread of radioactive materials | * Safety glasses * Impermeable gloves or chemical-resistant gloves * Lab coat | In adjacent area:   * Safety glasses * Lab coat |
|  |  | R02. Working with unsealed radioactive materials in hazardous chemicals (corrosives, flammables, liquids, powders, etc.) | * Cell damage or spread of contamination plus hazards for the specific chemical | * Safety glasses (chemical splash goggles for splash hazard) * Chemical-resistant gloves * Lab coat   *Note: Select gloves for applicable chemical hazards above.* | In adjacent area:   * Safety glasses * Lab coat |
|  |  | R03. Working with sealed radioactive sources or devices containing sources of radioactive materials (e.g., liquid scintillation counters, gas  chromatographs/electron capture detectors, static eliminators, etc.) | * If sealed source is compromised due to removal from equipment or physical abuse: cell damage, potential spread of   radioactive materials | PPE is not necessary under normal operating instructions  *Note: Source may not be removed form device except by EHS or manufacturer.* | N/A |

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| Activity performed | | **Laser Hazards**   * The laboratory has an LUA that addresses all of these. Skip to next section. | | | |
| **Yes** | **No** | **Activity in lab** | **Potential Hazard** | **Active Researcher PPE**  **(Direct Manipulation)** | **Adjacent Individuals PPE** |
|  |  | L01. Open Beam - 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 | * Optical density and wavelength-specific safety glasses based on individual beam parameters | All personnel in laser use room:   * Optical density and wavelength-specific safety glasses based on individual beam parameters |
|  |  | L02. Open Beam - Viewing a  Class 3R laser beam with magnifying optics | * Eye damage | * Optical density and wavelength-specific safety glasses based on individual beam parameters | N/A |
|  |  | L03. Open Beam - Working with a Class 3B laser open beam system with the potential for producing direct or specular reflections | * Eye damage | * Optical density and wavelength-specific safety glasses based on individual beam parameters * Lab coat   or appropriate clothes | All personnel in laser use room:   * Optical density and wavelength-specific safety glasses based on individual beam parameters * Lab coat   or appropriate clothes |
|  |  | L04. Open Beam - Working with a Class 4 laser open beam system with the potential for producing direct, specular or diffuse reflections | * Eye damage, skin damage | * Optical density and wavelength-specific safety glasses based on individual beam parameters * Lab coat   or appropriate clothes | All personnel in laser use room:   * Optical density and wavelength-specific safety glasses based on individual beam parameters * Lab coat   or appropriate clothes |
|  |  | L05. Non-Beam - Handling dye laser materials, such as dyes, chemicals, and solvents | * Cancer, explosion, fire | * Gloves, safety glasses, NFPA 2112 flame-resistant lab coat or coveralls | In adjacent area:   * Safety glasses * Lab coat |
|  |  | L06. Non-Beam - Maintaining and repairing power sources for large Class 3B and Class 4 lasers | * Electrocution, explosion fire | * Electrical isolation mat * Electrical protection lab coat (NPFA 70E) or coveralls | N/A |
|  |  | L07. Enclosed Beam - Using a Class 1 device housing a Class 3B or Class 4 enclosed or embedded laser with the potential for beam exposure during a Service Event | * Eye damage, skin damage | * Optical density and wavelength-specific safety glasses based on individual beam parameters * Lab coat   or appropriate clothes | All personnel in laser use room:   * Optical density and wavelength-specific safety glasses based on individual beam parameters * Lab coat   or appropriate clothes |

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| Activity performed | | **Non-Ionizing Radiation Hazards** | | | |
| **Yes** | **No** | **Activity in lab** | **Potential Hazard** | **Active Researcher PPE**  **(Direct Manipulation)** | **Adjacent Individuals PPE** |
|  |  | N01. Working with sources of ultraviolet radiation. | * Conjunctivitis, corneal damage, skin redness | * UV face-shield * Gloves * Lab coat | In adjacent area with direct line of sight:   * UV face shield * Lab coat |
|  |  | N02. Working with infrared emitting equipment (e.g. glass blowing). | * Cataracts, burns to cornea | * Appropriate shaded glasses * Lab coat | In adjacent area with direct line of sight:   * Appropriate shaded glasses * Lab coat |

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| **Unique or Lab-Specific Activities**  If your lab conducts any additional or unique activities that are not listed above, identify the potential hazards and appropriate PPE then add these activities to the table below. If a lab activity is similar to but somewhat different than one of the common activities listed, include it in this  section as well. | | | |
| **Activity in lab** | **Potential Hazard** | **Active Researcher PPE**  **(Direct Manipulation)** | **Adjacent Individuals PPE** |
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**Hazard Assessment Certification:** This certifies that you have conducted the hazard assessment.

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| **Name and title of person conducting assessment** | |
| **Name: \_\_\_\_\_\_\_\_\_\_\_\_\_** | **Title:** |
| **Date assessment completed:** |  |

The following laboratory personnel have reviewed the Laboratory Hazard Assessment Tool specific to this laboratory and have received the following training:

1. What hazards are present in this laboratory
2. When PPE is necessary
3. What PPE is recommended
4. How to properly don, doff, adjust and wear PPE
5. Limitations of PPE
6. Proper care, maintenance, useful life, and disposal of PPE
7. General PPE safety practices (e.g. not wearing PPE outside the laboratory)

# Lab Name:

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| **Name** | **Training Date** |
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**Maintain a copy of the signed hazard assessment with lab safety records.**

At this point in the application, the PI will be able to print:

* The Laboratory Hazard Assessment
* A Laboratory Roster
* An Individual Lab Personnel’s Certification End of Laboratory Hazard Assessment