

**a. Purpose**

Personal protective equipment (PPE), such as gloves, lab coats and safety glasses/goggles, is required to ensure that laboratory personnel are adequately protected from laboratory hazards.

This Policy provides guidance on the provision, selection, use and care of PPE in research laboratories at Columbia University (the “University”). This Policy is consistent with U.S. Occupational Safety and Health Administration regulations, as well as the content and recommendations of the Centers for Disease Control and Prevention and National Institute of Health’s *Biosafety in Microbiological and Biomedical Laboratories* and the National Research Council’s *Prudent Practices in the Laboratory*.

This Policy applies to all personnel, including faculty, staff, students and visitors, in the University’s research laboratories.

**b. Applicability/Responsibility**

In accordance with OSHA regulations, affected personnel are required to be provided with appropriate PPE at no cost, and to wear appropriate PPE whenever the potential for exposure to occupational hazards exists. Safety is a shared responsibility of all persons using a laboratory. The employee supervising a laboratory (i.e., the principal investigator (“PI”) and/or the laboratory manager) (the “PPE Responsible Party”) is responsible for conducting a PPE hazard assessment and ensuring the availability of PPE in his/her laboratory. Laboratory personnel are responsible for receiving, understanding and complying with this Policy and all other relevant University-, departmental- and laboratory-specific policies, procedures and guidance, as well as attending training for determining when PPE is necessary and how to select, use and maintain PPE. Environmental Health & Safety (EH&S) is responsible for assisting laboratories in completing PPE hazard assessments and training laboratory personnel. EH&S is responsible for the maintenance of this Policy.

PPE requirements will vary based on the hazardous materials used and the specific work practices involved, and the PPE provided must be adequate for the research conducted in the laboratory. In performing a PPE hazard assessment, the PPE Responsible Party may use the Laboratory Assessment Tool and Chemical Hygiene Plan, available within the [LION database](#). EH&S can assist laboratories in assessing work process hazards and identifying appropriate PPE. Please note: the hazard assessment should include an evaluation of ancillary laboratory activities, such as desk- or computer-based work, including requirements for protection from proximal work with hazardous materials. Laboratories should establish a risk-based standard for the use of PPE by personnel participating in these activities. A baseline practice of the use of a laboratory coat by all personnel in the laboratory, at all times, is recommended.

PPE must be used when engineering and administrative controls are either not possible or infeasible. PPE can also be used to complement these other controls when they do not completely eliminate the hazard.

**PPE should not be used as a substitute for engineering controls including fume hoods, glove boxes, process enclosures, etc., or for good work practices and personal hygiene; PPE complements such hazard control measures.**

**c. Definitions**

N/A

**d. Procedures**

1. Laboratory Coats ("lab coats"): A lab coat is required to be worn by all personnel in a research laboratory whenever there is the potential for exposure to hazardous materials. Assessment of this exposure potential should include personnel involved in ancillary laboratory activities.

Hazards include:

- Chemicals, biological agents and radioisotopes
- Corrosive substances
- Flammable materials
- Open flames and hot processes
- Pyrophoric materials

Lab coats should be knee length, closeable and have full sleeves. There are numerous types of lab coats and the specific lab coat selected must reflect the particular hazards and procedures in the laboratory. Additional information on [various types of lab coats and selection criteria](#) for each can be found online. Liquid resistant aprons (vinyl, rubber) should supplement lab coats for activities with an elevated splash potential.

Non-disposable lab coats must be laundered, or if the lab coat is heavily soiled or contaminated (i.e., by radioactive or chemical material), disposed of through EH&S. EH&S is available to provide evaluation of lab coat contamination and suitability for continued use.

2. Hand Protection: Gloves are required to be worn by all personnel in a research laboratory while working with hazardous materials or processes, or whenever there is the potential for the hands to be exposed to physical hazards or hazardous materials.

Hazards include:

- Skin absorption of substances such as radioisotopes, biological agents and chemicals
- Cuts and lacerations
- Abrasions
- Punctures
- Chemical or thermal burns
- Temperature extremes

There are numerous types of gloves and the specific type of glove selected must reflect the particular hazards and procedures in the laboratory. Additional information on [various types of gloves and selection criteria](#) for each can be found online.

Gloves should only be worn in the laboratory. The user should wash his/her hands immediately before and after using gloves. Gloves should be changed regularly or as soon as possible if they are contaminated, torn or damaged. Disposable gloves should not be reused and reusable gloves should be cleaned according to manufacturer's instructions, unless contaminated. Gloves contaminated with radioactive materials must be disposed of in a "dry solid radioactive waste" container, segregated by isotope. Gloves that have been used to handle infectious or potentially infectious materials should be disposed of as Regulated Medical Waste in red bags. Chemically contaminated gloves can generally be disposed of in the regular trash, unless significantly soiled, in which case they should be disposed of as hazardous waste.

**Because many people are sensitive to latex, and repeated contact with the natural proteins in latex can lead to allergic sensitization, latex gloves should be avoided whenever possible.**

3. **Eye and Face Protection:** Appropriate eye protection is required to be worn by all personnel in a research laboratory while handling hazardous materials, and whenever there is the potential for the eyes or face to be exposed to physical hazards or hazardous materials.

Hazards include:

- Flying particles or droplets
- Extremely hot or cold material, including boiling and cryogenic liquids
- Corrosive liquids, including acids or caustic materials
- Biological or radioactive materials
- Chemical gases or vapors
- Light radiation from lasers or welding

There are numerous eye/face protection options and the specific type of eye/face protection must reflect the particular hazards and procedures in the laboratory. Eye glasses and contact lens do not offer the appropriate level of protection. Eye/face protection must be properly fitting and worn as intended and should be replaced immediately if damaged. Please view [additional information on various types of eye/face protection](#) and selection criteria for each online.

4. **Foot Protection:** In general, research laboratory work processes do not require specialized protective footwear. However, there may be instances where laboratory personnel are required to wear disposable shoe covers, such as when working with blood or other potentially infectious materials and where it is reasonable to anticipate that such materials will contact the feet. Under no circumstances should laboratory personnel wear sandals or open-foot shoes.

To determine if other forms of foot protection, such as steel toed boots, are required please refer to the Personal Protective Equipment Hazard Assessment Tool or EH&S for guidance.

5. **Clothing:** Long pants or the equivalent should be worn at all times; shorts or short skirts and sandals or open-foot shoes must not be worn in the laboratory. Good laboratory practices require that a combination of personal clothing and PPE should cover all exposed skin. It is also important to avoid loose, dangling jewelry that may become caught in equipment or make incidental contact with

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hazardous materials. It is strongly recommended that laboratory personnel have a change of clothes and shoes at work to utilize as needed.

6. Respiratory Protection: Work with hazardous materials should be performed with the protection of properly functioning engineering controls (e.g., chemical fume hood or biological safety cabinet). Engineering controls generally protect laboratory personnel from airborne exposure to hazardous substances, thus eliminating the need for a respirator.

If laboratory personnel believe there is a need to wear respirator, EH&S must be consulted for an evaluation. If a respirator is deemed necessary, affected employees will be required to enroll in the University's Respiratory Protection Program, which includes obtaining medical clearance from a healthcare professional to wear a respirator, as well as respirator fit-testing and use training.

7. Storage, Use, and Maintenance of PPE: Always store PPE in a clean, dry place away from chemical contact. Examine PPE for cleanliness and structural or other visible defects before each use, and clean or launder PPE when soiled or dirty. Replace if there are structural or visible defects. Lab coats and other PPE should not be taken home for personal laundering. Please visit the EH&S website's PPE page for further information on laundering.

**e. Emergency contacts**

N/A

**f. Medical Surveillance**

N/A

**g. Recordkeeping/Training**

All personnel working in University research laboratories are required to complete Laboratory Safety/Chemical Hygiene Training. Training includes relevant information for determining when PPE is necessary and how to select, use and maintain PPE, and is available via classroom session or RASCAL. RASCAL maintains records of all laboratory personnel who complete EH&S training.

**h. Appendices**

N/A

**i. Forms**

Personal Protective Equipment (PPE) Hazard Assessment Tool for Laboratory Activities

**j. References**

[Occupational Safety and Health Administration \(29 CFR 1910.132\)](#)

[Centers for Disease Control's Biosafety in Microbiological and Biomedical Laboratories](#)

*Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards, 2011*

[Columbia University EH&S Personal Protective Equipment website](#)

**k. Acknowledgements (optional)**