

Personal Protective Equipment (PPE) Standard For KAUST Laboratories

Because of the intrinsically hazardous nature of laboratory work, KAUST requires that all personnel working in laboratories adhere to the procedures set forth in this document. This procedure is to provide a baseline for which all laboratories at KAUST must operate under concerning clothing and PPE.

The information contained in this procedure is intended to comply with international standards and laboratory best management practices to position KAUST within the international community to be a leading international research institution with a strong commitment to protecting the health and safety of its faculty, staff, students, and visitors.

This procedure applies to anyone entering a laboratory where hazards are present, including but not limited to:

- All students
- All visitors
- Contractors
- Laboratory Managers
- Maintenance personnel
- Post-Docs
- Principle Investigators and Faculty
- Research Scientists
- Service providers
- Staff

Hazards found in a laboratory (to include service corridors if hazards are present) include, but are not limited to, the following:

- Biological hazards, e.g., biological agents, human-derived material, animal tissue, infectious agents (human, animal, plant), recombinant/synthetic nucleic acids, transgenic organisms, and biotoxins.
- Hazardous chemicals (as defined by SDS) include corrosives, flammables, toxins, carcinogens, teratogens, mutagens, irritants, sensitizers, engineered nanomaterials, and chemicals with unknown properties.
- Physical hazards such as moving machinery, broken glass, flying objects, dust, compressed gases, etc.
- Ionizing and non-ionizing radiation (intense light sources, UV, X-rays, gamma rays, microwaves, etc).

REQUIREMENTS FOR LABORATORY CLOTHING

Laboratory clothing is the personal clothing that one wears before stepping into a KAUST laboratory. Rather than list what clothing is acceptable, it is best to describe what type of clothing is not acceptable from a health and safety perspective to be worn while working in a laboratory environment.

Prohibited:

- Sandals, flip-flops, open-backed shoes, or any other footwear that exposes the feet to hazards such as spilled chemicals or broken glass. Wear closed-toed shoes, preferably made of leather or other material that is not very porous. Footwear must also be able to resist puncture wounds from stepping on short needles and broken glass.
- Clothing that exposes skin above the knee joint. Examples such as short skirts and short pants.

- Loose hanging headwear that falls beyond the collar of a lab coat. Examples include ghutrahs, shemaghs, veils, scarves, hijabs, turbans, head wraps, etc. Females who wear a hijab should wear hijabs made from 100% cotton. Loose flowing ends of such clothing must be tied securely and tucked under the lab coat.
- Loose hanging clothing that is not confined by the use of a lab coat is forbidden due to its increased ability to snag/catch/entangle onto objects. Examples include articles such as robes, abayas, thobes, very loose arm sleeves, etc. If this type of clothing is worn, then a lab coat must be employed to reduce this hazard. Further, loose hanging clothing that touches the floor is also unacceptable.
- Long and loose hair. Hair that falls beyond shoulder length needs to be secured to avoid being caught in any moving equipment or from falling into any hazardous material.
- Loose or dangling jewelry. Similar to loose hair, loose and dangling jewelry provides a snagging hazard. In addition, all forms of metallic jewelry must be avoided while working near exposed and live electrical circuitry, as metals are great conductors of electricity.

STANDARD BASELINE OF PERSONAL PROTECTIVE EQUIPMENT

Proper Personal Protective Equipment (PPE) must be worn at all times in the laboratory while working with or being near hazards. Just because one is not working with a hazard does not mean one cannot be exposed to a hazard. Many accidental exposures simply involve those within the vicinity of a hazard. This is the rationale behind why a baseline level of PPE is required of all personnel inside KAUST laboratories. Housekeeping, maintenance, and hazardous waste personnel are exempt from lab coat usage as they do not perform laboratory work, and their uniform is cleaned through a laundry service.

Eyewear – The eyes are highly delicate and naturally vulnerable, making them susceptible to serious injury. To minimize risk, all personnel working in or passing through laboratory spaces with potential hazards must wear appropriate protective eyewear at all times. If you need prescription safety glasses, the research safety team has a [bulletin](#) describing how to purchase them.

Lab coat – Lab coats must be worn while working with or around hazards in the laboratory. Furthermore, lab coats must not be worn outside the laboratory as this may spread possible contaminants. KAUST provides a [laundry service for laboratory coats](#).

Gloves – Since most operations in a laboratory require the use of hands, the use of gloves as PPE is of paramount importance to reduce exposure to hazards. Gloves must be worn while working directly with hazards and should be removed immediately after work with the hazard is done or after any sign of contamination appears. PPE is only a temporary barrier, so gloves must be removed immediately after performing a task, followed by hand washing. Temporary barriers are not permanent barriers, and many hazards will eventually penetrate, given enough time. Changing gloves frequently and often is a good practice to prevent exposure. Changing gloves often also helps to prevent spreading contamination to other areas in the lab.

Respirators – The use of respirators should only be used when the use of engineering controls (e.g., fume hoods) is not practical. Engineering controls are the preferred method to prevent exposure to hazardous materials. If engineering controls are not practical or feasible, then the use of a respirator can be employed, but before one uses a respirator, one must be enrolled in the [Respiratory Protection Program](#), which requires;

- Medical [evaluation/screening](#) and certification from a medical authority.
- Training – [Respiratory Protection Training](#).
- Arrange for fit testing through the [Respiratory Protection Program](#).

Contact hse@kaust.edu.sa for assistance if you believe you need to use a respirator.

RISK ASSESSMENT FOR PPE:

Additional PPE may be required depending on the hazard and the work being performed. Contact hse@kaust.edu.sa if any further assistance is needed in this determination. This procedure is only a baseline standard. Any center or lab has the authority to institute/require stricter standards of PPE usage than this procedure.

On the other hand, some laboratory work does not warrant the above minimum requirements for clothing and PPE, e.g., the use of microscopes, some work with display screens, or other labs that don't pose potential hazards. In cases like this (less stringent PPE requirements), working with a lower PPE standard must be clearly justified in a risk assessment with consideration of all who could be affected, including laboratory users, cleaning staff, visitors, contractors, etc. This assessment must be completed and signed by the PI/Lab manager/supervisor before implementation of the procedure. Contact hse@kaust.edu.sa if you believe you have such a situation.

PPE OUTSIDE OF LABS:

To maintain a safe and professional environment, PPE must not be worn outside laboratory spaces, including public areas such as the spine, offices, workstations, common corridors, pantries, and dining spaces. If PPE is required in different lab areas, it should be carried either folded inside out or placed in a secure bag rather than worn. Hazardous chemicals and infectious biological materials must be transported in robust, leak-proof secondary containers to prevent spills. Users may wrap impermeable material (e.g., gloves) over contact points when handling these containers but must avoid touching shared surfaces directly. For safe transport, personnel must use the Level 0 tunnel between buildings instead of the spine and service elevators and corridors inside buildings rather than passenger elevators or public spaces. Research materials may only be transported through public areas if they are non-hazardous, securely packaged in secondary containers, and moved over short distances, such as within the same floor.

Additionally, specific guidelines must be followed when transporting cryogenic materials in elevators. Whenever possible, carts should be used to enhance safety and reduce physical strain. Adhering to these measures helps ensure the safety of all research community members.

IMPORTANT NOTE:

Enforcement of *Minimum Requirements for PPE in KAUST Laboratories* is similar to all other KAUST laboratory procedures. It must be enforced through the chain of command, and that begins with the Principle Investigator (PI). Even though the PI is ultimately responsible for enforcing KAUST's procedures toward clothing and PPE usage, peer enforcement must also supplement this PI enforcement aspect. The behavior of properly wearing laboratory clothing and PPE usage must be instilled and engrained in all who work in KAUST laboratories. It is a behavior that will be expected of you as long as you work in any laboratory in the world. Protecting everybody only works if everybody cooperates. Keeping our people safe will require striving for safety excellence, which will also bring about scientific excellence.