



Guidance for BSL2+ COVID Laboratories

Biosafety.program@ucdenver.edu

BSL2+ is a term frequently used to describe laboratories where work with biological material is conducted in a BSL2 facility with biosafety practices and procedures typically found at BSL3. The enhanced requirements are based on a risk assessment of the biological material and types of experiments/procedures conducted. **The amount of viral load and the potential for aerosolization affect the biosafety enhancements needed for mitigation.**

A. Laboratory Facilities

- a. The facility is isolated from other BSL2 lab space and have locking doors to restrict access to approved personnel that have additional training. Badge access is preferred, key access is acceptable.
 - i. Preferred to be dedicated space
- b. A sink with soap and paper towels is available, near the exit, for handwashing. A sink with an emergency eye wash station is preferred.
- c. The facility is easily cleanable. Surfaces are non-porous. No carpets or cloth-covered chairs permitted.
- d. Unneeded equipment and other clutter is not permitted. Cardboard boxes are not permitted. Cabinets and plastic storage containers are preferred. A Biosafety cabinet (BSC) is available and certified at least annually.
- e. Vacuum lines (if needed) have a double liquid trap system protected by a HEPA filter. Appropriate disinfectant is in the liquid trap system and disposed of daily.
- f. Appropriate signage listing hazards, biosafety level, contact information, required personal protective equipment (PPE) and donning/doffing procedures is posted at the entrance/exit.
- g. A biological spill kit is available in the facility.
- h. Equipment is decontaminated before repair, maintenance or removal.
- i. EHS performs an inspection and audit of the facility and SOPs before final approval of a facility as BSL2+.

B. Biological Safety Practices and Procedures

- a. A BSL2+ Standard Operating Procedure document is approved by EHS and IBC and available to research staff.
- b. All work with biological material is conducted in a BSC or other containment equipment.
- c. Centrifuges are equipped with safety cups/rotors sealed with gaskets.
 - i. Gaskets are regularly inspected for cracks or leaks.
 - ii. The cups/rotors and drum are cleaned and disinfected regularly.
 - iii. Small centrifuges can be used inside a BSC.
- d. Centrifuge safety cups/rotors are loaded in a BSC and disinfected before placed in the centrifuge. Cups/rotors are opened and unloaded in a BSC.



- e. Specimen containers, blood tubes, etc. are opened in a BSC.
- f. Wastes (i.e. pipet tips, etc.) are decontaminated in the BSC before removal
 - i. Example 1: pipet tips discarded in container of disinfectant, which is capped and sprayed down with disinfectant before removal from BSC.
 - Example 2: collect pipet tips in small bag in BSC, tie up the bag, disinfect the outside of the bag, remove from BSC and place in biohazard waste bin for autoclaving or vendor disposal
- g. PPE is removed and hands are washed prior to exiting the facility.
- h. Any spills or exposures are reported to the Principal Investigator and EHS.
- i. Research staff is enrolled in Occupational Health and self-monitor for symptoms/fever.
- j. Competence in procedures and donning/doffing PPE demonstrated before personnel allowed to work in facility. Training on safe practices for working in a BSC is offered by EHS.
- k. Hazard Awareness training for visitors and Facilities Management staff.

C. Personal Protective Equipment (PPE)

- a. Disposable solid-front, water resistant gowns or lab coats (completely buttoned up) with knit cuffs are worn over clothing. May be reused for up to one week if disinfected between uses (spray with disinfectant before removing).
 - i. Gowns/coats are disposed of after no more than one week or when they have been contaminated or show signs of wear.
- b. Double gloves are worn. Extended cuff gloves over short cuff gloves is preferred.
 - i. Outer gloves cover knit cuffs.
 - ii. Outer gloves are changed when they become contaminated.
 - iii. Outer gloves are removed before bringing hands out of the BSC.
- c. Face and eye protection is required, examples:
 - i. Surgical mask with attached eye visor is preferred.
 - ii. Surgical mask with safety glasses/goggles.
 - iii. Surgical mask with face shield.
- d. Reusable PPE is disinfected after use.
- e. Respiratory protection (if handling airway specimens with high viral loads).

D. Biosecurity

- a. Transport SOP should include tracking such that the specimens are either in possession of authorized personnel or in locked storage.
- b. Records kept of whom specimens are shared with or shipped to.
 - i. Date, type of specimen, active or inactivated, amount, receiver.

Steps to start transition from a BSL2 to BSL2+ space:

- a. Determine space options
- b. Consult Biosafety in EHS for audit /recommendations
- c. Develop BSL2+ SOP, COVID plan (in conjunction with COVID Official for floor)
- d. Make changes to space



- e. Obtain PPE
- f. Staff take trainings:
 - i. Return to work (SkillSoft)
 - ii. Schedule BSC training with Biosafety (Zoom training)
 - iii. Schedule PPE training with Biosafety (in person)
 - iv. Respiratory protection (if applicable SkillSoft, via Zoom)
- g. Biosafety final audit of space, procedures, workflow