

## Biosafety Level 3 (BSL-3)

Once again building on the two prior biosafety levels, a biosafety level 3 (BSL-3) laboratory typically conducts research into or work on microbes that are either indigenous or exotic and can cause serious or potentially lethal disease through inhalation. Common examples of microbes found in BSL-3 labs include yellow fever, West Nile virus, and the bacteria that causes tuberculosis.

Microbes found within biosafety level 3 settings are so serious that work is often strictly controlled and registered through the appropriate government agencies. Laboratory personnel are also under medical surveillance and may require immunizations for the microbes they work with.

Common safety controls within a BSL-3 lab include:

- The use of PPE, including goggles and gloves; respirators may also be required
- The use of solid-front wraparound gowns, scrub suits, and/or coveralls is often required
- Access to a hands-free sink and eyewash station available near the exit
- Sustained directional airflow to draw air into the laboratory from clean areas toward potentially contaminated areas (exhaust air cannot be recirculated)
- Self-closing set of locking doors with access away from general building corridors

Access to a BSL-3 laboratory is restricted and controlled at all times.



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## Biosafety Level 4 (BSL-4)

Biosafety level 4 (BSL-4) labs are rare; however, a small number exist in the U.S. and around the world. As the highest level of biological safety, BSL-4 labs work with highly dangerous and exotic microbes, such as the Ebola and Marburg viruses. Infections caused by these types of microbes are often fatal and come without treatment or vaccines.

In addition to biosafety level 3 considerations, biosafety level 4 laboratories must follow these safety protocols:

- Personnel must change clothing before entering the facility and shower upon exiting
- All materials must be decontaminated before leaving the facility
- Personnel must wear the PPE from lower BSL levels, as well as a full-body, air-supplied, positive pressure suit
- Access to a Class III biological safety cabinet

BSL-4 labs are extremely isolated, often located in an isolated and restricted zone of a building or in a separate building entirely. BSL-4 labs also feature a dedicated supply of exhaust air, as well as vacuum lines and decontamination systems.



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