



## Biosafety Levels

### 3. Biosafety Level-3 (BSL-3)

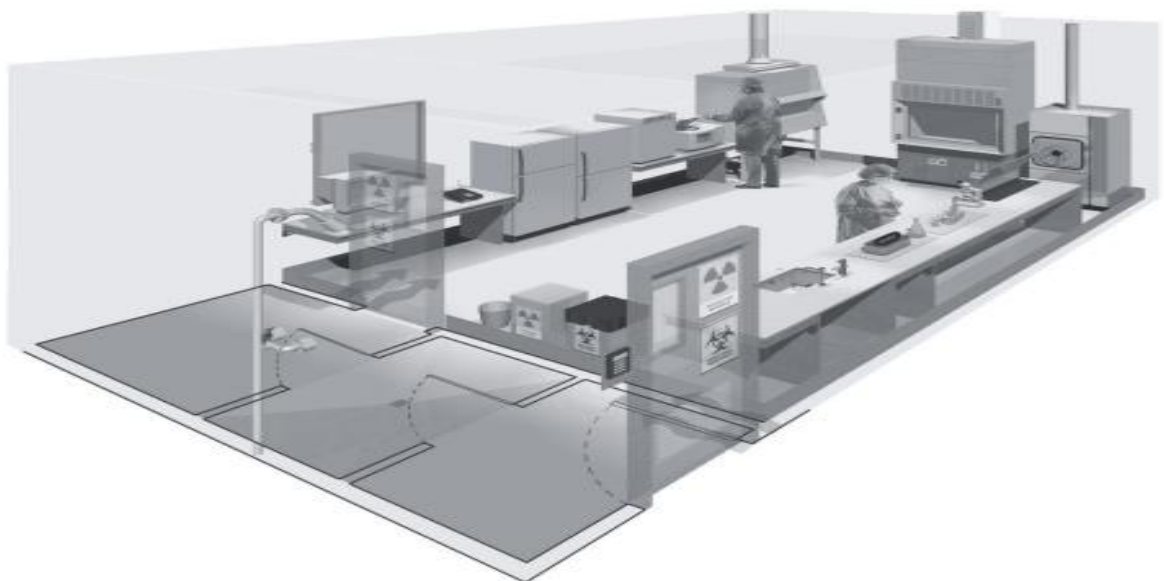
#### *Biosafety Level 3 (BSL-3)*

- Work with **indigenous or exotic agents with potential for respiratory transmission**; may cause serious or lethal infection (i.e. *Mycobacterium tuberculosis*, St. Louis encephalitis virus, and *Coxiella burnetii*)
- Basic level of containment:
  - Standard microbiological practices
  - Secondary barriers (i.e. BSCs required, directional air flow, anti-room entry)
  - Special practices (i.e. restricted access, solid front lab coat, autoclave required)

#### *Biosafety Level 3 (BSL-3)*

##### Design

- Restricted access; lockable doors – emergency “open”
- Sealed windows
- Hands-free sink near door
- Surfaces resistant to chemicals
- Monolithic floor; sealed room penetrations
- Ducted exhaust
- Decontamination method available



## Organisms

The pathogens that require BSL-3 laboratories include HIV, H1N1 flu, *Yersinia pestis*, *Mycobacterium tuberculosis*, Coronavirus, [Rabies Virus](#), West Nile Virus, Ricketts, etc.

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## 4. Biosafety Level 4 (BSL-4)

### Biosafety Level 4 (BSL-4)

- Work with **dangerous and exotic agents that pose a high individual risk of life-threatening disease**; may be transmitted via aerosols; no available vaccine or therapy (i.e. Ebola, Marburg)
- Basic level of containment:
  - Standard microbiological practices
  - Secondary barriers (i.e. BSCs, personal protective suits or Class III BSCs, directional air flow)
  - Special practices (i.e. isolated/restricted access facility, sealed rooms, treated waste)

### Biosafety Level 4 (BSL-4)

#### Design

- Dedicated non-re-circulating ventilation
- HEPA filtered supply and double HEPA filtered exhaust air
- Occupants wear one-piece personal protection suits
- Redundant systems

### Biosafety Level 4 (BSL-4)

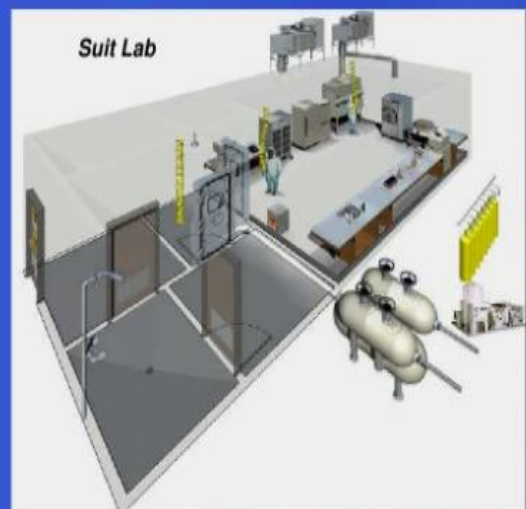
#### Types

- Class III biosafety cabinets (cabinet line)
- Personal protective suits (suit lab)

#### Design

- Isolated facility; separate building
- Daily inspections of containment parameters
- Restricted access
- Changing rooms & showers
- Double door autoclaves
- All room penetrations sealed

### Biosafety Level 4 (BSL-4)



## Biosafety Level 4 (BSL-4)



### Organisms

The BSL-4 level pathogens include the risk group IV organisms like [Ebola virus](#), Central European Encephalitis virus, Hemorrhagic viruses, etc.

**Note:** To understand the previous homework question, you should see the link below:

- <https://microbenotes.com/biosafety-levels/>