

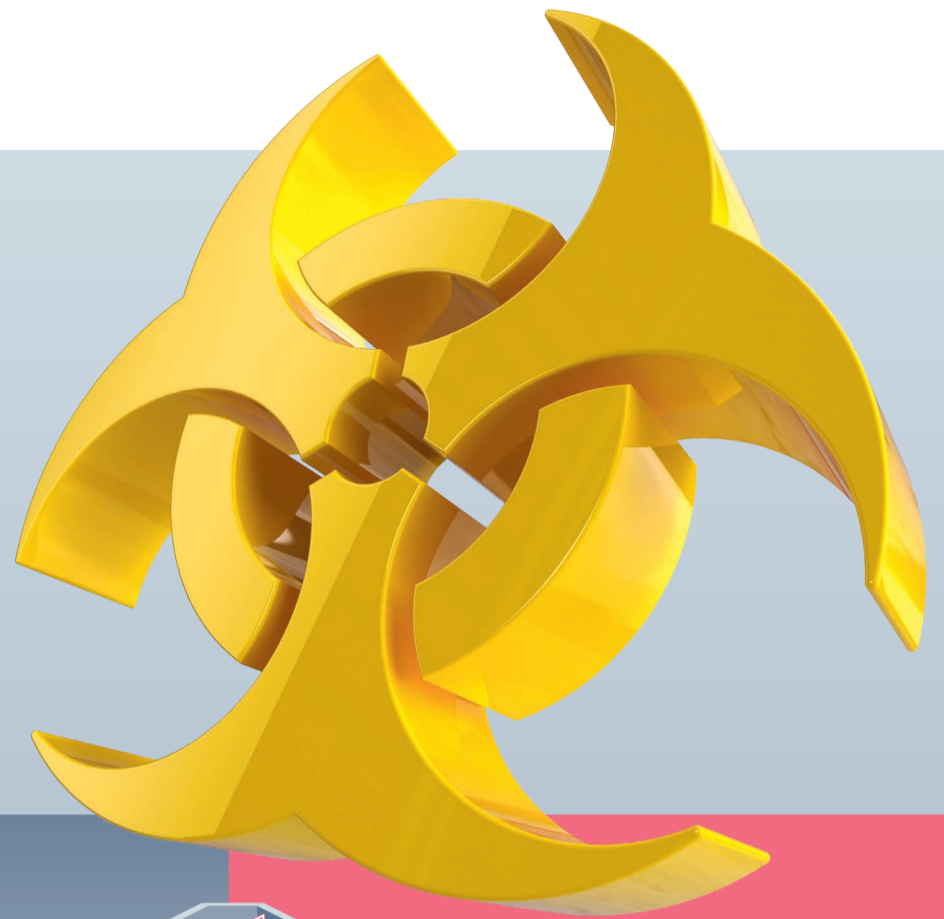
# Stay Informed

## Biosafety Levels

Work with biological material can sometimes be dangerous for laboratory staff and the environment. Material must be handled according to its level of hazardousness. For this purpose, four biosafety levels (BSL) have been established as standards.\*<sup>1</sup> Below you will find descriptions of typical biological material, equipment, and requirements for each level.

Each safety standard requires a certain level of skill in handling potentially dangerous material. Depending on the safety level, precautions must be taken inside the laboratory and the facility.

\*<sup>1</sup> <https://www.cdc.gov/labs/pdf/CDC-BiosafetyMicrobiologicalBiomedicalLaboratories-2009-P.PDF>



### Biosafety level 4

4

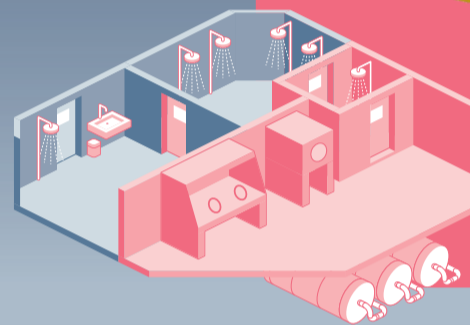
#### Personal equipment

- > Full-body, air-supplied, positive pressure suit



#### Facility requirements

- > Biosafety level 3 standard
- + Separate building or isolated zone
- + Dedicated supply and exhaust, vacuum, and decontamination systems
- + Suit laboratory



#### Biological samples

- > Ebola
- > Marburg viruses



### Biosafety level 3

3

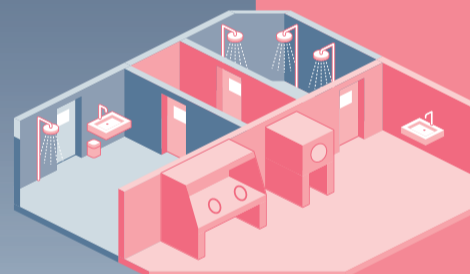
#### Personal equipment

- > Personal protective equipment
- > Respirators required
- > All work with microbes must be performed within a biological safety cabinet



#### Facility requirements

- > Biosafety level 2 standard
- + Physical separation from access
- + Self-closing, double-door access
- + Exhausted air not recirculated
- + Negative airflow into laboratory
- + Entry through airlock or anteroom



#### Biological samples

- > *Mycobacterium tuberculosis*
- > West Nile virus
- > SARS-CoV-2 (in Cell Culture)\*<sup>2</sup>



\*<sup>2</sup> <https://www.cdc.gov/coronavirus/2019-ncov/lab/lab-biosafety-guidelines.html>

### Biosafety level 2

2

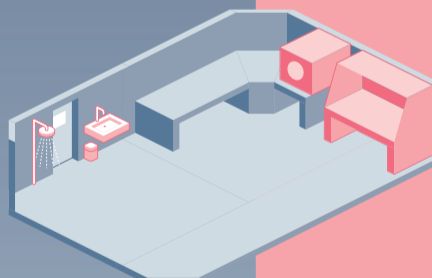
#### Personal equipment

- > Personal protective equipment
- > Eye protection/face shields
- > Biological safety cabinet



#### Facility requirements

- > Biosafety level 1 standard
- + Autoclaved trash
- + Biohazard warning signs
- + Biological safety cabinet



#### Biological samples

- > *Mycoplasma pneumoniae*
- > Herpes simplex virus
- > SARS-CoV-2 (COVID-19 Diagnostics)\*<sup>3</sup>



\*<sup>3</sup> <https://www.cdc.gov/coronavirus/2019-ncov/lab/biosafety-faqs.html>

### Biosafety level 1

1

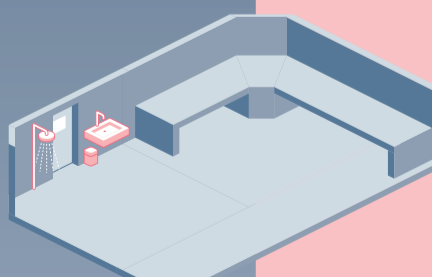
#### Personal equipment

- > Lab coat
- > Gloves
- > Eye protection



#### Facility requirements

- + Open workbench
- + Basins to wash hands
- + Laboratory trash
- + Emergency shower



#### Biological samples

- > Nonpathogenic strain of *E. coli*
- > *Bacillus subtilis*
- > Yeast

