

Biosafety Levels (BSL)

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Biosafety Levels Latest News

Nehru Zoological Park, Hyderabad, will soon establish a Biosafety Level-3 (BSL-3) laboratory, the first of its kind in southern India, enabling rapid diagnosis, post-mortem analysis, and research on zoonotic diseases.

About Biosafety levels

- Biosafety levels (BSL), also known as biological safety levels or biohazard levels, define the **necessary containment precautions for handling infectious agents in laboratory settings.**
- They're a **mandatory** requirement **in any biological research facility.**
- Biosafety levels **contribute to the isolation of dangerous organisms and lethal agents.**
- The levels of containment **range from** the lowest biosafety level 1 (**BSL-1**), **to** the highest at level 4 (**BSL-4**).
- **Each BSL lab level builds upon the previous level**—thereby creating layer upon layer of constraints and barriers.
- These lab levels are **determined by the following:**

- **Risks** related to containment
 - **Severity of infection**
 - **Transmissibility**
 - Nature of the work conducted
 - **Origin of the microbe**
 - **Agent in question**
 - **Route of exposure**
- **BSL-1:** It applies to laboratory settings in which personnel work with **low-risk microbes** that pose little to **no threat of infection in healthy adults**. Because of this, **BSL-1 labs** typically **do not need to be isolated from surrounding facilities**.
 - **BSL-2:** It covers all laboratories that work with **agents associated with human diseases** — that is, **pathogenic or infectious organisms** — that pose a **moderate health hazard** if inhaled, ingested, or exposed to the skin.
 - **BSL-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**.
 - **BSL-4:** BSL-4 labs are **rare**. As the highest level of biological safety, BSL-4 labs work with **highly dangerous and exotic microbes**. Infections caused by these types of microbes are **often fatal** and come without treatment or vaccines.
 - At the **lowest level** of biosafety, **precautions** may **consist of regular hand-washing and minimal protective equipment**.
 - **At higher biosafety levels**, precautions may include **airflow systems, multiple containment rooms, sealed containers**, positive pressure personnel suits, established protocols for all procedures, extensive personnel training, and **high levels of security** to control access to the facility.

Source: **TT**

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