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All about India's first state-funded BSL-4 lab for deadliest pathogens in Gujarat

Planning for this lab began in mid-2022, and its foundation stone was laid more than three years later, on Tuesday. The facility will comprise BSL-4, BSL-3, BSL-2, as well as ABSL-4 and ABSL-3 laboratory modules, along with advanced utilities and supporting infrastructure.

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Union Home Minister Amit Shah and Gujarat Chief Minister Bhupendra Patel during the foundation stone laying ceremony of Gujarat Biotechnology Research Center's "BSL-4-Biocontainment Facility" in Gandhinagar on Tuesday. (ANI)

Union Home Minister Amit Shah laid the foundation stone of the Bio-Safety Level 4 (BSL-4) Containment Facility and laboratory in his Lok Sabha constituency of Gandhinagar on

Tuesday (January 13).

He called it a "health shield" for India and said it heralded the "beginning of a **new era of health security** and biotechnology in the country".

What is a BSL-4 facility?

The technical term "Bio-Safety Level 4) represents the highest level of biological containment. Such laboratories are designed to safely research the world's most dangerous and life-threatening pathogens which are highly infectious and often lack effective vaccines or treatments.

At these labs, under extremely controlled conditions that are periodically inspected and monitored based on international standards, scientists conduct advanced research on high-risk pathogens, work on the development of diagnostics, vaccines, and therapeutics, and conduct rapid outbreak investigation and response.

The BSL-4 laboratory coming up in Sector-28 of Gandhinagar, along with an Animal Bio-Safety Level (ABSL) facility, will be a strategic national asset where research is conducted on the deadliest pathogens known to mankind, including the Ebola virus, Marburg virus, Crimean-Congo Hemorrhagic Fever (CCHF) virus, Kyasanur Forest Disease virus, and Nipah virus, among others.

The Gujarat lab

The BSL-4 lab being built in Gandhinagar, Gujarat, at a cost of ₹362 crore over 11,000 square meters, will be the second such civilian research facility in India and the first to be fully funded and controlled by a state government. It is being constructed under the Gujarat State Biotechnology Mission (GSBTM).

It will function under the Gujarat Biotechnology Research Centre (GBRC), which currently has a BSL-2+ lab and was one of the first in India to decode the whole genome sequence of the SARS-CoV-2 coronavirus that caused the Covid pandemic.

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Notably, planning for this lab began in mid-2022, and its foundation stone was laid more than three years later, on January 13, 2026.

The facility will comprise BSL-4, BSL-3, BSL-2, as well as ABSL-4 and ABSL-3 laboratory modules, along with advanced utilities and supporting infrastructure. The laboratory is being developed in compliance with guidelines issued by the US CDC (Centers for Disease Control and Prevention), US NIH (National Institutes of Health), DBT India (Department of Biotechnology), and ICMR (Indian Council of Medical Research).

This will help the state not only respond to deadly human disease outbreaks in real time but also to zoonotic diseases transmitted from animals to humans, as well as aid in research and development of vaccines and therapeutics.

Speaking to the Indian Express, a senior official from the Department of Science and Technology in Gujarat said, "This facility will be constructed according to stringent international standards. Our scientists will be able to conduct research on deadly pathogens that are currently hampered by bottlenecks in the field due to lack of BSL-4 facilities. Further, the DBT has also signed an MoU declaring this upcoming lab as a national facility, which means that there will be guidance from expert institutions across India."

The official further said, "The ABSL-4 lab will enable researchers to work with animal diseases, whose samples earlier had to be sent to the National Institute of High Security Animal Diseases (ICAR-NIHSAD) in Bhopal. We will have two components: one will be testing samples, and the second is producing vaccines from antibodies in animals."

Consultants on the project include the National Dairy Development Board (NDDB) of India, which has experience setting up a BSL-3 lab; Doshi Consultants Pvt Ltd, which has worked on setting up pharmaceutical and biotech facilities; Basler & Hoffmann AG of Switzerland as biosafety consultants; and HT Group GmbH of Germany, among others.

Existing BSL-4 and ABSL-4 labs in India

Currently, there is only one civilian BSL-4 laboratory functional in India, located at the National Institute of Virology (NIV) in Pune, Maharashtra.

However, in late 2024, the Defence Research and Development Organisation (DRDO) under the Defence Ministry set up its own BSL-4 lab in Gwalior, Madhya Pradesh.

According to officials involved in setting up the BSL-4 lab in Gujarat, globally there are 69 BSL-4 laboratories operational or under development.

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to tackle cases

Currently, there are only two high-security labs in India studying the deadliest zoonotic diseases. One is the National Institute of High Security Animal Diseases (ICAR-NIHSAD) in Bhopal, Madhya Pradesh, with a current ABSL-3+ rating, but which is slated to be upgraded to ABSL-4 according to an announcement in June 2025.

The other lab is the International Centre for Foot and Mouth Disease (ICAR-ICFMD) in Bhubaneswar, Odisha, which has an ABSL-3Ag rating.

154 BSL-2 and 11 BSL-3 laboratories in India

As of March 21, 2025, according to a reply in Parliament by the Department of Health Research (DHR), the Ministry of Health and Family Welfare had established a network of Virus Research and Diagnostic Laboratories (VRDL) under the central sector scheme "Setting up of a Nationwide Network of Laboratories for Managing Epidemics and National Calamities." Under this scheme, 165 biosafety laboratories, including 11 BSL-3 level labs and 154 BSL-2 level labs, have been approved.

Since 2021, a total of 42 VRDLs have been approved, of which 41 labs are BSL-2 and 1 lab is BSL-3. These labs are mainly located in the microbiology departments of various medical colleges and research institutions. Of these, 38 were functional and 4 were under development.

Besides that, there are 21 other biosafety laboratories established at various institutes of the Indian Council of Medical Research (ICMR), equipped with different levels of biosafety: BSL-4 (1), BSL-3 (8), and BSL-2 (12).

Under the Department of Science & Technology (DST), the Anusandhan National Research Foundation (ANRF) has also funded 5 BSL/ABSL-3 labs under the Intensification of Research in High Priority Areas (IRHPA) program.

Under the Department of Biotechnology (DBT), 26 biosafety laboratories have been established in various DBT institutes.

Under the Indian Council of Agriculture Research (ICAR), 9 biosafety laboratories have been established in various ICAR institutes.

Under the Council of Scientific and Industrial Research (CSIR), 11 biosafety laboratories have

been established in various CSIR institutes.