



***Microbial  
Containment  
Complex (MCC)***

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## Historical background

MCC has been established by the Indian Council of Medical Research (ICMR) at Pashan, Pune in a campus admeasuring about 27 acres. Planning Commission approved the construction of the containment laboratories as a part of NIV in 1979.

## Mission

To enhance capability of the nation for investigations on deadly viral diseases by providing a center of excellence, safe workplace and risk-free environment, through establishment of state-of-the-art technology laboratories.

## Rationale

- Globally, there is a strong perception that studies on viruses need much more care and caution to avoid health hazards to the laboratory personnel as well as to the community.
- Re - emerging and newly - emerging viral diseases such as yellow fever, Hantaan, Ebola, Nipah, SARS, influenza, etc., causing devastating outbreaks are noticed in different parts of the world.
- Threat of bio - terrorism has now become a globally well-recognized reality.
- To deal with naturally occurring or man-made hazards, proper containment facilities are essential for handling of viruses, developing reagents, vaccines, etc.

- In absence of proper and safe place of storage, viruses often get destroyed and become unavailable for future use.
- Considering these broader perspectives the Indian Council of Medical Research established MCC, a national facility, as an extension of NIV, Pune.

## Objectives

- To establish containment laboratories to facilitate study, storage and safe handling of highly infectious viruses.
- To create a center of excellence for study of high-risk and novel viruses.
- To establish a National Virus Repository.
- To establish a serum bank.
- To develop reagents and immuno-biologicals.
- To conduct teaching and training programs on bio-safety and bio-containment.
- To establish a rapid response team to investigate unusual epidemics of viral origin.



## Major activities

### National virus repository

- More than 600 isolates of viruses are available.
- Some strains may be useful in future for developing reagents and vaccines.
- Authentic place for depositing reference viruses.
- Facility for restricted distribution and disclosure would be available to the depositors.
- Well-characterized strains with relevant details will be made available to users.
- All data will be available in electronic format.

### Diagnostic reagent development and supply

- Non-availability of standard diagnostic reagents for the study and diagnosis of viral infections has become a major bottleneck in the field of virology.

- Focus to prepare reagents for specific and sensitive diagnosis of viral diseases of public health importance.
- Development of commercially non-viable, but strategically, important reagents.

### Special pathogen program

- Well-equipped rapid response teams to investigate epidemics.
- Comprehensive and independent laboratory support for detection, propagation and identification of novel exotic agents.



## Infrastructure Overview

Basic Laboratory Building: An elegant building - a three-floor structure with air-conditioned laboratories.

Conference and Meeting Halls

Administration Building

Monkey-run

Guesthouse

Staff Quarters

Garbage Disposal System

Incinerator and Autoclaves



## High containment laboratory: biosafety level 3

A state-of-the-art, protocol-based high containment laboratory of bio-safety level 3+, planned and designed in accordance with WHO guidelines has been established.

Biosafety Level 3 is essential for clinical, diagnostic, research production teaching facilities, in which work is done with indigenous or exotic agents that may cause serious diseases due to exposure. Laboratory personnel have specific training in handling lethal agents and are supervised by competent scientists.

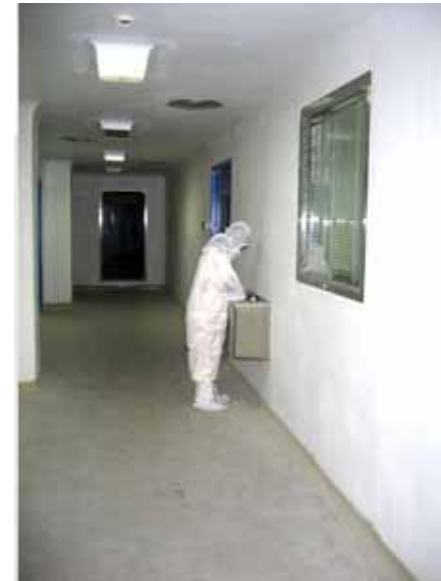
Personnel wearing appropriate personal protective devices conduct experiments in containment modules. The laboratory has special engineering and design features.



## Features of BSL 3+ laboratory

- Key areas of the facility comprise of material staging, molecular biology, tissue culture, serology, entomology laboratories, operation theater for necropsy / autopsy, animal hold rooms, etc.
- The laboratory operates under differential negative pressure preventing any leakage or escape of air from the laboratory to the ambient.
- Supply and exhaust of air through HEPA filters.
- Procedures involving the handling of infectious materials are conducted within glove-box isolators and biological safety cabinets.
- 100% exhaust air system.
- Restricted and controlled access to the laboratories.
- Entry through a set of change and shower rooms with mandatory shower while exit.
- Each laboratory room with independent ventilation system to allow its isolation from rest of the areas.
- With each supply and exhaust air ventilation system 'fail-safe' biosafety isolation dampers are provided. Hence, decontamination of individual laboratory rooms is possible.
- Use of chemical-resistant materials for construction to allow their use for decontamination / dis-infection.

- Built-in decontamination facility for laboratory waste, through steam sterilizers and incinerator.
- Separate holding facilities for healthy and infected animals.
- Clean and hygienic environment for animals.
- Provision of CCTV cameras for surveillance and monitoring of the laboratory.
- Monitoring and control of laboratory through a Building Management System.
- Treatment of all effluent from the laboratory as per the applicable protocols.



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