Some success stories

(A) DBT-ICMR collaborative effort on HIV/AIDS:

Under DBT-ICMR collaborative effort on HIV/AIDS, a consortia based Cohorts for HIV Resistance and Progression in Indian Children and Adults (CoHRPICA) Program was initiated in 2017-18 with the aim to create uniform standardized cohorts across stages of HIV-infection, the first centralized state-of-the-art bio-repository at National AIDS Research Institute (NARI), Pune for access to biological samples and a National Database at National Institute of Epidemiology (NIE), Chennai to aid in identification of critical research questions and promoting multidisciplinary research collaborations to address the national HIV epidemic. In line with the WHO guidelines, the objectives and cohorts samples have been revised with the approval of Project Oversight Committee.

(D) Indo-SA Collaborative Research Program on HIV, AIDS and TB:

Recognizing the importance of collaborative & complimentary research to address regional needs, DBT in collaboration with DST, and Medical Research Council & Dept. of Science & Technology, Govt. of South Africa embarked on a collaborative Research Program on HIV, TB and TB/HIV. This collaborative program is under the framework of bilateral Science & Technology Cooperation agreement between the Department of Science & Technology, Ministry of Science & Technology, Governments of India and South Africa. Three joint proposals in TB, HIV, TB/HIV have been recommended under this collaborative effort.

(E) Technologies transferred & commercialized:

Dr. Jitendra Singh, Former Union Minister for Science and Technology, Government of India, launched Diagnostic kits for Celiac Disease (Celiac Microlisa & Celiac Card) in an event held in the International Centre of Genetic Engineering and Biotechnology (ICGEB), New Delhi, on 28th October 2014. These kits have been developed through a collaborative, multi-institutional, inter-disciplinary approach funded by the Department of Biotechnology, Ministry of Science & Technology, Government of India. The participating institutions were ICGEB, New Delhi, Translational Health Science and Technology Institute, Gurgaon; All India Institute of Medical Sciences, New Delhi, and M/s J. Mitra and Co., New Delhi (Industrial partner). These indigenous kits are rapid, sensitive, specific and would be much cheaper as compared to the imported kits.

(4) Outcome of last 5 years:

No. of publications:- Approx. 300 (including R&D projects, PCBR, THSTI-IAVI HVTR Lab)

No. of patents filed/granted: - 6

No. of manpower trained:- Approx.250 manpower trained in different positions such as Junior Research Fellow, Senior Research Fellow, Research Associate (I/II/III), Project Assistants, Research Assistants, Lab Technician under R&D projects.

(5) Any major facilities supported/created:
A. National Liver Disease Bio-bank:

The National Liver Disease Biobank (NLDB) is a DBT-supported facility established at ILBS, New Delhi (http://www.nldb.in) to accelerate deliverable basic and translational research in the field of acute and chronic Liver and Biliary diseases, Gallbladder and various hepato-biliary tumours. It is the first Liver disease biobank in India to provide researchers and industries with high quality biosamples and the patient data with follow-up in order to facilitate high quality research in the field of liver disease, genetics, biomarker research, molecular diagnostics, drug discovery, and new therapeutics.

It aims to become a nodal centre for providing the clinical and basic researchers to reliably store biomaterials and carry out their research on one platform.

B. Policy Center for Biomedical Research (PCBR)

The Policy Center for Biomedical Research has been established at THSTI, Faridabad with the aim to bridge the gap between health researchers, those who implement and are impacted by that research by providing analysis on health technologies that could guide strategic planning to meet local health needs.

Following Initiatives have been taken under this program:

a. **Partnership with INCLEN** to identify the burden of influenza in pregnant women in a demographic disease and environment surveillance site in Haryana.

b. **Validation of TB LAMP**: A network of sites is being created to validate the TB LAMP test at the CHC level in 5 states.

c. **Partnership with Accelerated Plan for the Elimination of the Lymphatic Filariasis (APELF)** for creating enabling environment for LF elimination.

Salient achievements of this centre during the period:

a. **Point of Care Diagnostics**:

   i. **LED lighting source for microscopy**: PCBR is partnering with DSS, New Delhi creating a prototype which will optimise LED as lighting source for microscopy. It is under validation at AIIMS.

   ii. **Validation and Optimization of ReaTBDx**: PCBR facilitated Reametrix, Bangalore for the validation studies, and optimization of ReaTBDx at SGPGIMS, Lucknow.

   iii. **TB LAMP testing**: A consortium has been created by PCBR, for implementation through MoHFW and NIB for LAMP test at CHC Level (4 CHCs in 5 States).

   iv. **Surveillance of capabilities in doing diagnostic**: PCBR in collaboration with NCDC, ICMR and Manipal Center for Virology etc. in a CDC funded study successfully mapped 750 labs for their capabilities in doing diagnostics work as well as biosafety preparedness.

b. **Vaccines**:

   i. **Oral Cholera vaccine**: In a BMGF funded study, PCBR prepared a Roadmap for cholera prevention and control.

   ii. **Consultation to GAVI and WHO’s Global Task Force for Cholera Control**:

   iii. **Rotavirus Vaccine**: PCBR is also involved in committees set up by the Government for introduction of vaccines such as rotavirus vaccine, to provide inputs in technical issues such as cross over in use of two different vaccines in the program.
iv. **Pneumococcal Conjugate Vaccine:** The PCV got introduced and Pneumococcal Etiology surveillance program initiated with the support of the ICMR.

v. **Influenza vaccine:** In collaboration with with INCLEN, PCBR will identify a target group for influenza vaccination and further move towards policy of maternal immunization against influenza in India.

vi. **Neglected Tropical Diseases:** A roadmap for vaccine introduction in Kala Azar elimination program is being created, including landscaping the vaccine development scenario and analysis pro and cons of each vaccine type through meetings of an “expert group”. It also involves identifying the population group and building a framework for long term sustainable vaccine introduction for VL vaccine. Regulatory pathways for developing NTD vaccines and analysis of shortcomings of different Leishmania vaccines have been started with four candidate Leishmania vaccines.

**C. Advanced Technology Platform Centre, Regional Centre for Biotechnology**

The Advanced Technology Platforms Centre (ATPC) was conceived with the aim of providing access to cutting-edge technologies to researchers in India. Till now, the Flow Cytometry facility, Protein Expression and Purification Facility, Mass Spectrometry Facility, Molecular Interactions Facility and Optical Microscopy have been established at this centre.

**D. HIV Vaccine Translational Research (HVTR) Laboratory**

The HIV Vaccine Translational Research (HVTR) Laboratory at THSTI has been carrying out early translational research and development under the joint partnership program between THSTI and the International AIDS Vaccine Initiative (IAVI). The HVTR laboratory has established capacity in isolating antigen-specific broadly neutralizing monoclonal antibodies (bnAbs) from peripheral blood mononuclear cells (PBMC) obtained from a well-defined HIV-infected elite neutralizer as a part of technology transfer under ongoing partnership program from the IAVI-Neutralizing Antibody Center (NAC). One patent entitled Engineered recombinant protein antigen of trimeric mimic of hiv-1 envelope glycoprotein spike has been obtained under this project.

(5) **Major initiatives undertaken:**

i. **Mission program on Antimicrobial Resistance (AMR):** Antimicrobial resistance (AMR) is one of the major threats to human health in the 21st century, with some bacterial pathogens acquiring resistance to all clinically available antibiotics. Worldwide, infections caused by multi-drug resistant (MDR) bacteria are now a major cause of morbidity & mortality and have markedly enhanced healthcare costs. Considering AMR as a National priority, under **National Action Plan** endorsed by Govt. of India, the Department of Biotechnology has initiated a major **Mission program on Antimicrobial Resistance** with the vision to develop indigenous and cost-effective therapies against AMR; categorization of AMR-specific pathogen priority list of India; establishment of Bio-repository for AMR-specific pathogens; and development of rapid and cost-effective diagnostic kits to identify AMR-specific pathogens.
ii. **AMR-specific Bio-repository:** Considering AMR as the topmost national priority, the Department has notified National Centre for Microbial Resource (NCMR), National Centre of Cell Sciences, Pune (an Autonomous Institute of DBT) to function as Bio-repository for resistant microbes/infective agents (Bacteria and Fungi)” and to carry out collection, storage, maintenance, preservation and characterization of these microbes across the country. Further, the Department is working to share the information regarding National AMR-specific Pathogen list which will be available very soon including a landscaping report on existing rapid and cost-effective diagnostic kits to identify AMR-specific pathogens.

iii. **Joint DBT-BIRAC call on AMR:** In a process to fulfill the ambition of Mission AMR program, Department of Biotechnology (DBT) in collaboration with Biotechnology Industry Research Assistance Council (BIRAC) invited LoIs in the area of development of new antibiotics and alternatives to antibiotics to counter AMR. This initiative focuses on nurturing collaborations between academia and industry partners to enhance their capabilities and competencies for developing new antibiotics and alternative therapeutics for AMR through innovative approaches that have the potential to transform public health action on a national or global scale.