



CENTRE FOR BIOSEPARATION TECHNOLOGY (CBST)



ABOUT US

The Centre for BioSeparation Technology (CBST) was created under the “Intensification of Research in High Priority Areas” programme funded by the **Department of Sciences and Technology (DST)**, Government of India. **Prof. M.A. Vijayalakshmi**, having been identified for her expertise in the field of Purification Science and Technology was invited from France to set up the Centre in India with a host structure of her choice to help our country in developing this important area, much required for Industry-Academia in R&D. She chose VIT University, Vellore as the host structure to initiate the Centre and, CBST was formed in the year 2005. The centre is projected by DST as a ‘National Facility’ for research & development. The sustained efforts and inputs from the centre have contributed towards the greater goals of the nation and its significantly new developments such as Make in India, Skill India Mission, etc. The centre aims for a translational mode of work, by taking a working idea from the benches of a laboratory to the industrial scale for delivering an applicable product. This innovative research with high intellectual input has resulted in development of very original and simplified systems for both analytical and preparative aspects of proteins. These methods are complimentary / competitive to conventional ones in efficiency and are being adopted by the industries both in India and abroad. This has made an important contribution for India both scientific and technological aspects to face the global challenges, resulting in products produced by Indian Industries contributing to its growth. This culture is successfully transferred to youngsters in India, in bringing a paradigm shift in the young researchers shaped at CBST.

THEMES

- Chromatography
- Proteomics
- High value-added protein expression using Mammalian, Yeast, bacterial, and plant systems & purification
- Microfluidics devices development and research
- Translational Research work – bridging the gap between industry and academia
- Cell culture and antibody production & purification.
- Diagnostic System Development
- Antimicrobial Resistance
- Structural biology research
- Nanotechnology-based drug delivery for diabetes
- Metabolic Disorder Research: Pathway finding of plausible products from plants and other sources

Population at CBST

Total number of Internal Full-Time (IFT) PhD:	42
ICMR research fellows (present):	3
DST research fellows (present):	2
Total number of External Part-Time PhD:	3
Total Number of Post-Doctoral Fellows:	1
Total number of faculties:	9
Total number of passed out PhD:	35
Total number of passed out M.Tech (Research):	13

Research Highlights

Total number of publications:	150+
International Patents (Awarded):	12 (8 Int + 4 Indian)
International Patents (filed):	2
National Patents (Awarded):	3
National Patents (filed):	5
Total number of projects:	22 (5 International and 17 National)

Research Programmes

Ph.D.; Master’s and Bachelor’s Project Research

SERVICES PLATFORM

- Mass spectrometry: Two different types of Mass Spectrometers are available, and CBST encourages sample analysis for VIT residents and outsiders.
- BIACORE 3000 SPR: Using Surface Plasma Resonance, binding affinity, such as protein-protein interactions, can be calculated.
- Development of monoclonal and polyclonal antibodies in mice and rabbits, respectively, is rendered for antibody production with a defined collaboration (Both Academics and Industries).
- Purification experiments are designed at lab-scale and scale-up advising is also provided.
- Molecular biology service platforms.
- Electrochemical Workstation: Biosensor studies can be carried out for both VITians & Other academic institutions with service charge / in collaboration
- Service platform for Plant extraction: Phytochemical analysis, cell-based assays (cell viability assay, cytotoxicity studies), can be carried out for both VITians & Other academic institutions with service charge / in collaboration and Preclinical studies (with collaboration)

MAJOR PROJECT HIGHLIGHTS

❖ Translational Research Projects:

- Development recombinant FVIII for the treatment of blood clotting disorder haemophilia A in collaboration with **Advanced Molecular Therapeutics (AMTHERA)**, Bengaluru, India
- Development of cost cost-effective platform for the induction of immune tolerance to therapeutic biopharmaceuticals in collaboration with the academia-industry partnership between VIT Vellore, Virchow Biotech Pvt. Ltd. Telengana; Centre **Recherche cordeliers**, Paris, France, SPAN SARL, France.
- Development of polymeric dendrimer nanoparticles for targeted drug delivery to cancer cells. **King Abdullah University of Science and Technology (KAUST)**, Saudi Arabia
- Production of *Aloe vera*-based product for its applications in diabetes treatment, with guidelines and regulations from Ayush guidelines in collaboration with **Arya Vaidya Nilayam, Madurai**
- Novel monoclonal antibody-based diagnostics against specific and sensitivity to Plasmodium falciparum has been translated from the laboratory scale to industry through **Span SARL** for developing rapid diagnostic kits.

❖ Department of Biotechnology (DBT) – Biotechnology Industry Research Assistance Council (BIRAC) project for the development of monoclonal antibody-based diagnostics for the detection of COVID-19

❖ Indo-French collaborative project on cardiovascular diseases, funded by BIRAC and CEFIPRA

❖ Central Institute of Brackishwater Aquaculture Project - CBST on antibody development

❖ National Institute of Research on Tuberculosis (NIRT), Chennai – DST Project on novel biomarkers of LTb.

❖ Indian Council of Medical Research (ICMR) Project on Typhoid diagnosis

❖ CEFIPRA-funded project on psychotic disorders

❖ DBT programme support on Improved Production and Processing of Therapeutic Proteins

❖ Production of anti-TNF- α using different expression systems for cost-effectiveness, in collaboration with **M.S. University of Baroda**

❖ DBT & ICMR projects – Vitamin D sensor development.

❖ SERB-CRG – Microarray chip for post-translation modification studies

❖ Phyto-nanotherapy for the management of diabetes using green synthesis nanoparticles

CBST – NATIONAL AND INTERNATIONAL NETWORK

- | | |
|---|---|
| ❖ Indian Institute of Science (IISc), Bangalore | ❖ Dr. Reddy's Laboratory, Hyderabad |
| ❖ Christian Medical College (CMC), Vellore | ❖ Shanta Biotechnics Ltd., Hyderabad |
| ❖ Centre for Cellular and Molecular Biology (CCMB), Hyderabad | ❖ Bharat Biotech, Hyderabad |
| ❖ University Institute of Chemical Technology (formerly UDCT), Mumbai | ❖ Laila Pharmaceuticals Ltd., Chennai |
| ❖ Institute of Genomics and Integrative Biology (IGIB), Delhi | ❖ Natural Remedies, Bangalore |
| ❖ Institute of Microbial Technology (IMTech), Chandigarh | ❖ Université de Technologie de Compiègne (UTC), Compiègne, France |
| ❖ Indian Institute of technology (IIT), Delhi | ❖ Université de Bordeaux, Bordeaux, France |
| ❖ Institute of Bioinformatics (IOB), Bangalore | ❖ Uppsala University, Uppsala, Sweden |
| ❖ Blue Peter Research Centre (BPRC), Hyderabad | ❖ University of Twente, The Netherlands |
| ❖ JSS College of Pharmacy, Ooty, Tamil Nadu | ❖ University of Agricultural Sciences, Vienna, Austria |
| ❖ Madras University, Chennai, Tamil Nadu | ❖ Institute of Biotechnology, University of Cambridge, UK |
| ❖ Biocon Ltd., Bangalore | ❖ Leipzig University, Leipzig, Germany |
| ❖ Span Diagnostics Ltd., Surat, Gujarat | ❖ GBF, Braunschweig, Germany |
| ❖ Thirumalai Chemicals Ltd., Ranipet, Tamil Nadu | ❖ Food Technology University, Plovdiv, Bulgaria |
| ❖ Laval University, Quebec, Canada | ❖ University of Ljubljana, Slovenia, Europe |
| ❖ University of Campinas, Sau Paulo State, Brazil | ❖ Academy of Science, Moscow, Russia |
| ❖ Dalian University, Dalian, China | ❖ Weizmann Institute of Science, Rehovot, Israel |
| ❖ Korea Research Institute of Bioscience and Biotechnology (KRIBB), Taejon, Korea | ❖ Roswell Park Cancer Institute, New York, USA |
| | ❖ University of Arizona, Tucson, USA |

ACADEMIC AND INDUSTRIAL COLLABORATIONS



SOURCES OF FUNDING



Council of Scientific & Industrial Research



ICMR
INDIAN COUNCIL OF MEDICAL RESEARCH
Serving the nation since 1911



VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

CONTACT US

Dr. N.S. Jayaprakash
Professor and Director

Centre for BioSeparation Technology (CBST)
VIT University, Vellore 632014
Tamil Nadu, India

VIT Extension: 2374 / Landline: 0416-220-2374

Office Hours: Monday to Friday, 09:00 AM to 06:00 PM IST.

E-mail ID: director.cbst@vit.ac.in