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

CENTRE FOR BIOSEPARATION TECHNOLOGY

News Letter 2025

https://www.vit.ac.in/centres/cbst

The Centre for BioSeparation Technology (CBST) is dedicated to the field of separation sciences and molecular interactions. It has a unique combination of being innovative and highly intellectual, with a keen interest in translation. This has been built as a policy and scientific culture.

The Centre for BioSeparation Technology (CBST) was created under the "Intensification of Research in High Priority Areas" programme funded by the **Department of Science 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 significant 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 laboratory bench to the industrial scale to deliver an applicable product.

This innovative research, characterised by high intellectual input, has led to the development of original and simplified systems for both the analytical and preparative aspects of proteins. These methods are complementary to/competitive with conventional ones in terms of efficiency and are being adopted by industries in both India and abroad. This has made an essential contribution to India's scientific and technological advancements in addressing global challenges, resulting in products produced by Indian Industries contributing to its growth. This culture is successfully transferred to youngsters in India, bringing a paradigm shift in the young researchers shaped at CBST.

Dr. N.S. Jayaprakash
Professor and Director, CBST,
VIT - Vellore

Prof. M.A Vijayalakshmi
Founder Director, CBST,
VIT - Vellore

Vision

- To establish a World-Class R&D facility in Separation Science and related technologies
- To develop young scientists to fulfil the Industrial needs of India, particularly in the biopharma sector, and bring out validated products*

Mission

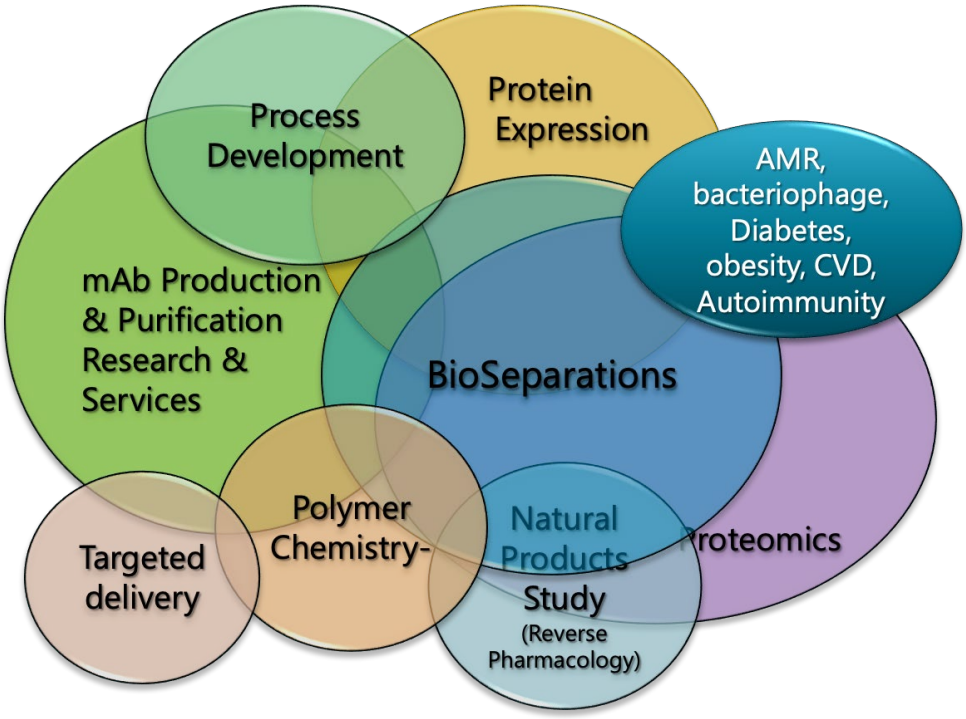
- Focus on Translation Research through multidisciplinary approaches, interfacing Biology and Chemistry

Monitored by a steering committee composed of eminent scientists and top members of VIT University. The Centre developed to new heights, and in May 2009, the Centre went through an independent "Performance Audit" by a committee headed by the President of the Indian National Science Academy (ISA) and was recommended for up-gradation to an "Advanced Centre" with continued funding to maintain its high-level potential and expertise in research activities.

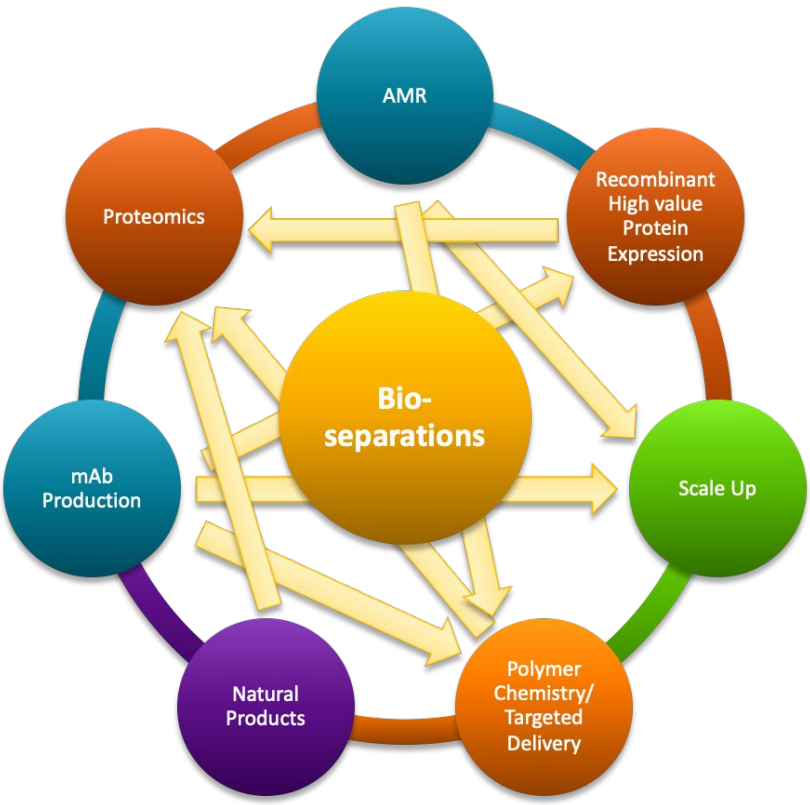
CBST, along with its initial facilities, currently features Chromatographic work stations (FPLC, HPLC, and four manual chromatographic workstations), Proteomic workstations such as Mass Spectrometer (QTOF & Triple Quadrapole ESI LC-MS), mammalian cell culture work, monoclonal antibody production, and recombinant protein expression (comprising mammalian, yeast, bacteria and Lemna expression systems). Renowned for its world-class innovative research and intensive training, CBST approaches research with multidisciplinary links involving state-of-the-art technologies, focusing mainly on translational aspects.

CBST practices and has a setup of "Approach research with a high level of multidisciplinary links". CBST is one of the rare Centres where the coexisting relation of Chemistry-Biology is realized and projects are done and made with this cross-talk relationship of different fields of Chemistry & Biology.

The Centre revolves around multidisciplinary themes involving BioSeparation or the 'Science of Purification' as its major arm, connecting various disciplines.



Linked together by Purification Science & Proteomics, the Centres move the rest of the areas forward into the area of translational research work, paving the path to success and development.



CURRENT HIGHLIGHTS

- CBST has developed a polymeric dendrimer nanoparticle for targeted drug delivery for diseases such as cancer as one of its many important research focuses. With immense success, an international patent (USA) has been granted for the same. King Abdullah University of Science and Technology (KAUST), Saudi Arabia, showed their interest in the pre-clinical studies and development of the product in India.

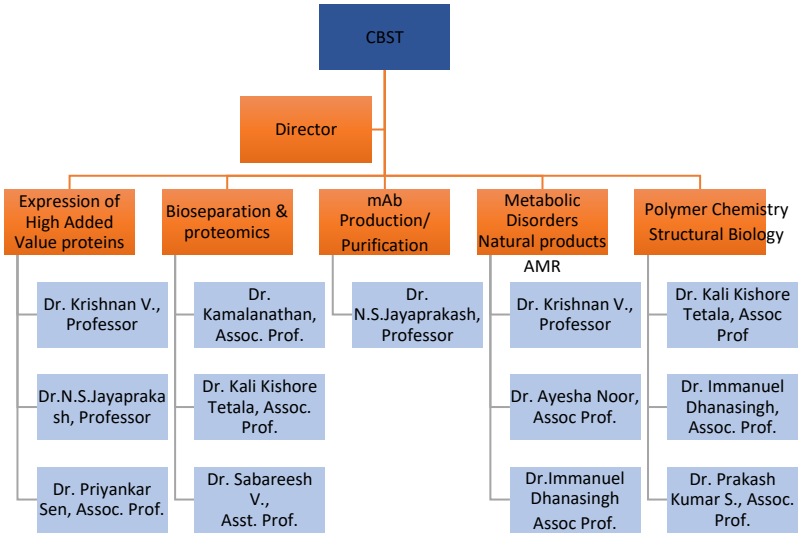
- Synthetic short peptides as a product for their applications in diabetes control. A patent has been filed.

- Considering the importance of COVID-19-based research, a COVID-19 diagnosis project (as CO-PI in collaboration with Prof. Senthilkumar A, Director, CO2 centre) has been sanctioned by ICMR for the development of an electroimmunosensor-based diagnostic for the detection of COVID-19.

- Antimicrobial resistance (AMR) is predicted to be the leading cause of death throughout the world, surpassing cancer in 2050. All the nations around the world have prioritized their research focus on the criteria of antibiotic resistance and next-generation antibiotics development. Our centre not only prioritizes finding a solution to AMR using structural biology, but also is in the process of developing fast detection kits for AMR at primary point of care.

- Enrichment of Vit B12 – Frugal methods of enrichment of Vit B12 in foods. A patent has been filed.

- Exploring the antiviral properties of wild-type and cardio-protective HDL ApoA1 variants. A project has been submitted to ICMR in collaboration with ICMR National AIDS Research Institute, Pune.



MAJOR PROJECTS AT CBST (with collaborations)

- **Indo-French collaborative project:** Indo-French consortium consisting of one academia & one industry partner funded by BIRAC and CEFIPRA for the development of a novel diagnostic for cardiovascular disorders.

- **ICMR Project on Typhoid diagnosis:** Indian Council for Medical Research (ICMR) funded project for the development of novel peptide-based diagnostics for the specific detection of typhoid infection. An MOU has been signed for a collaborative study with Kanchi Kamakoti Childs Trust Hospital, Chennai.

- **Bio-TIFAC**, Govt. of India, New Delhi. Development of novel process in isolating standardized extract of *Aloe vera* and its application for diabetes control. Bioprocess and Bioproducts Programme.

- **PALL Life Sciences**, Europe was involved with CBST for 'Study and evaluation of new chromatographic supports' for effective purification of biological molecules.

- **Christian Medical College (CMC), Vellore** and CBST: joint proposal submitted to ICMR.

- **Centre for Stem Cell Research (a unit of inStem, Bengaluru)** and CBST: collaboratively involved in the purification of significant FRIL protein from *Lablab purpureus*. In addition, collaboration of insilico structural studies were performed for their Sars-cov mRNA vaccine project.

- **Sri Narayani Hospital and Research Centre, Sri Puram, Vellore**: Cardiovascular Health & Diseases. EOI for a project proposal has been accepted by DBT.

- **ICMR - National Institute of Epidemiology, Chennai:** Collaboration in diagnostic development. An MOU is initiated.

Established Franco-Indian Health Institute for the Indo-Pacific Region

Inauguration of the Franco-Indian Health Campus in the Indo-Pacific

ILIADE PROJECT
Innovation through pLants and A.I. for InDia and France
Date: 27-04-2023 at 10.30 am
(CBST, SBST and VIT-IR)

ILIADE PROJECT is awarded for the Consortium
(5,20,000 Euros)
Innovation through pLants and A.I.
for InDia and FrancE
Innovation par les pLantes et l'IA pour l'InDe et la France
Funded by French External Affairs Ministry and
French Higher Education Ministry

Masters Twinning Programme between VIT and French partners in Biotechnology

Pathway-1

- **Masters in Biotechnology with specialization in Phytomedicine and Phytotherapy**
- **70% Courses from VIT; 30% courses from French Partners (Programme electives)**
- **25 students**
- **Fall Semester 2023 (Started)**

Pathway-2

- **Masters in Biotechnology with Specialization in Artificial Intelligence applied to biomedical data**
- **70% Courses from VIT, 30% courses from French partners (Programme electives)**
- **20 students**
- **Fall Semester 2024 (Started)**

- 6 meritorious students were selected to carry out a research project in France with a stipend
- 8 MSc + 1 PhD students were selected to visit Lyon, France, for a workshop (May 2024)
- 4 PhD students visited La Reunion for a workshop (Nov 2024)
- Implementing Master's students' projects in Indian partnering institutions.

INDUSTRIAL COLLABORATORS

POPULATION AT CBST

- Total number of Internal Full-Time (IFT) PhD : 51
- Total number of External Part-Time PhD : 3
- Total number of faculty : 10

CBST not only concentrated and focussed on product development & it's application but also in publishing paper in high impact journals.

RESEARCH HIGHLIGHTS

- Total Number of Publications: 218+
- Total Number of Publications (2024-25): 28
- Patents (Granted): 7

- Patents (Published): 7
- Patents (Filed): 3

2024- 2025

- Patents (Published): 3
- Patents (Filed): 2

FINANCIAL RESOURCES

2005 to 2010

1) Government Aided Support
   a) DST : 3 crore
   b) DBT : 2.3 crore
   c) Total : 5.3 crores
2) Industrial Support
   a) PALL Life Science : 40,000 EUROS
   b) Agilent Technologies : 56 Lakhs
   c) Total: : 1 crore (approx.)
3) Other Funding : 4 crores
4) Institutional Support (VIT) : Infrastructure, Management and Facilities

(5) **Grand Total : 10.3 crores**

2010 to 2017

1) Government Aided Support
   a) DST : 11.8 crores
2) Industrial Support
   a) BIA Separations : 1 crore (approx.)
3) Other funding : 4.3 crores (approx.)
4) **Total : 17.1 crores**

CBST was supported and funded by Indian Government and other funding agencies till 2017 and was functioning as an autonomous unit.

2018 to Present

1) External Funding : 5.4 Crores
2) Institutional Support (VIT) : Approx. 1 crore per year
3) Industrial support : Rs. 6.4 lakhs

RESEARCH EXPERTS AT CBST

1	 Dr. Jayaprakash N.S *Professor& Director*	**AREAS OF INTEREST** Immunotechnology, Polyclonal & Monoclonal Antibody Development, Animal Cell Culture, Bacteriophage as biocontrol agents against AMR pathogens
2	 Prof. M.A. Vijayalakshmi *Founding Director*	**AREAS OF INTEREST** Biochromatography and Pseudo bioaffinity systems, Molecular Recognition and Interactions, Affinity Technology, Biorecognition and Downstream Processing Research.
3	 Dr. Krishnan Venkatraman *Professor*	**AREAS OF INTEREST** Cardio Vascular Studies, Cell Biology, Metabolic disorders, Therapeutic Protein Expression and Mamallian Cell Culture.
4	 Dr. Ayesha Noor *Associate Professor (Sr)*	**AREAS OF INTEREST** Natural Products Research, Metabolic disorders (Diabetes and Obesity) research and Nutraceuticals
5		**AREAS OF INTEREST** Biosensors, Surface Chemistry, Polymer Material (Monoliths,

	Dr. Kishore Reddy *Associate Professor (Grade-2)*	Membranes, Beads) development, Organic Synthesis and Microfluidics
6	 Dr. Kamalanathan A.S *Associate Professor (Grade-1)*	**AREAS OF INTEREST** Purification Science, Understanding the Molecular Features and Mechanism of Biomolecules.

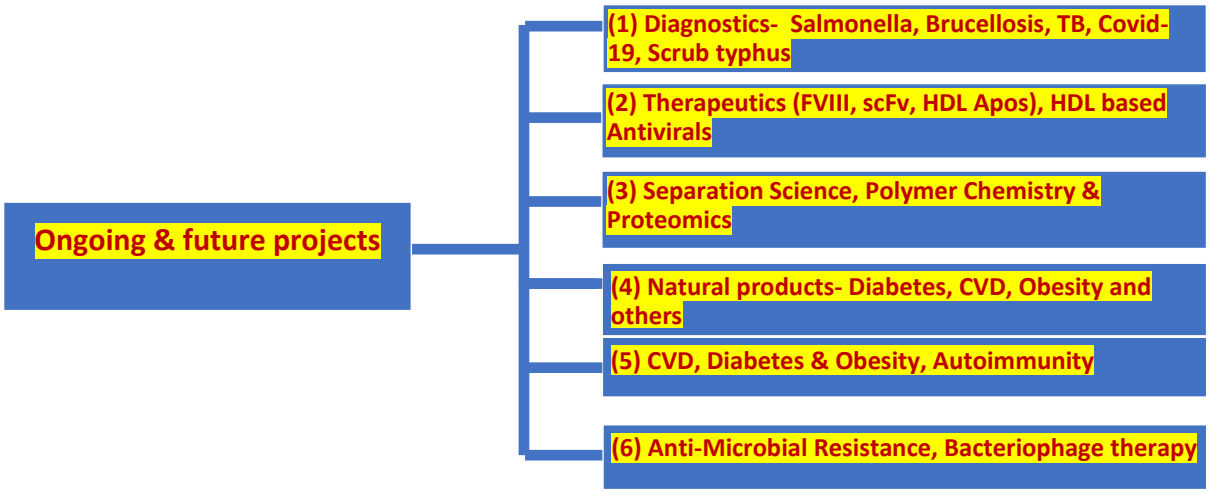
7	 Dr. Priyankar Sen *Associate Professor (Grade-1)*	**AREAS OF INTEREST** Recombinant protein expression using plant based expression system, purification of enzymes and their Biophysical and Biochemical Characterization
8	 Dr. Sabareesh Varadarajan *Assistant Professor (Senior)*	**AREAS OF INTEREST** Biomolecular Mass Spectrometry and its applications with specific interest in Tandem Mass Spectrometry and Proteomics
9	 Dr. Dhanasingh Immanuel *Associate Professor (Grade-1)*	**AREAS OF INTEREST** Structure and functions of proteins related to antimicrobial resistance, keratinolysis, Bioinformatics and Structural Biology
10	 Dr. Prakash Kumar Shukla	**AREAS OF INTEREST** Protein structural biology, epigenetic mediated cancer biology, and drug designing

	Associate Professor (Grade-1)	

More information: https://vit.ac.in/center/faculty/cbst

RESEARCH AT CBST

Development phase and translational research



A. CHROMATOGRAPHY AND PROTEOMICS

The Separation Science and Technology field is the central axis of the Centre. It is being developed both as a science to understand the molecular recognition and also as a technology to be exploited for (i) Efficient product recovery; (ii) Development of studies on protein-protein, protein-DNA and protein-ligand interactions; and (iii) As an exclusive tool for various proteomics approaches.

- Pseudobiospecific chromatography for recovery of high-added-value plasma proteins and recombinant proteins.
- Affinity traps - upstream and downstream in LC-MS approach: Applications demonstrated include plasma proteins, PPD for tuberculosis, microbial fermentation broth.
- Chromatographic stationary phase development through ultra-high

performance technology using connective interaction media (CIM) supports all possible chemistries.

- BIA platform of excellence setup at CBST (BIA-PEC) with the BIA separations, a multinational company with its HQ in Austria.

B. MICROFLUIDICS DEVICES AS TOOLS

During the last decade, there has been a surge in the life science research domain to develop efficient microfluidic devices to perform sample pre-treatment, screening and detection of biomolecules such as proteins from biological sources such as serum, milk, etc.

Currently, we are working on:

1. **Develop efficient microfluidic chips for protein purification for plasma proteomic applications (1 research project funded by SERB-DST)**

Post-translational modification (PTMs) events that alter the protein function play a vital role in the health and disease of human beings. Glycosylation and phosphorylation are two major and commonly occurring PTMs, and expression of PTM proteins is associated with the occurrence of various diseases like cancers, inflammatory conditions, and congenital disorders, and these proteins may serve as disease biomarkers for clinical diagnosis. However, the concentration of these PTM proteins is in nanomoles or, in some cases, picomoles, and they are masked by high and middle-abundant interfering proteins present in the sample. In this project, we are developing a microfluidic chip with various affinity ligands that detect and efficiently capture both glycoproteins and phosphoproteins from Human serum in the presence of highly abundant proteins.

2. **Develop microfluidic-based diagnostic chip for vitamin D detection (1 research project was funded by DBT)**

Vitamin D, produced in the liver, is an essential prohormone for human health. An individual with < 50 nmol of Vitamin D is considered Vitamin D deficient and is interlinked with several diseases, such as prostate cancer, cardiovascular diseases, etc. Existing detection systems have several limitations, such as requiring large

sample volumes, requiring high-end instrumentation to analyse vitamin D, etc. Also, the test is very expensive (Rs. 1500) and is not affordable to the large Indian population. Here, we are aiming to develop a point-of-care biosensor chip that is affordable and can sensitively detect Vitamin D in human serum using a drop of blood.

C. AFFINITY TECHNOLOGY AND CHROMATOGRAPHY

Pseudobiospecific ligand l-histidine is an inexpensive, highly stable, non-toxic ligand explored successfully over the last twenty years for the purification of immunoglobulins in immobilized histidine ligand affinity chromatography. It is of great interest to know the molecular recognition sites of IgG to immobilized l-histidine.

- We have used an in silico approach to explore the molecular recognition of l-histidine by IgG.
- We have assessed the feasible binding modes of histidine and its moieties at different sites of IgG and considered only those binding conformations which are exhibited via the imidazole ring NH group or any other OH-donating group, apart from the ones which are terminally conjugated with the support matrix.
- We categorised the binding site into two categories: category I: inner binding groove, and category II: surface binding groove, and observed that the hinge region of IgG has the most favourable binding pocket for L-Histidine and histidyl moieties.
- Serine and tyrosine residues on the hinge region make several significant interactions with L-Histidine and histidyl moieties, as hypothesized by Prof. Vijayalakshmi, the Hydrogen bond interactions making it a Hydrophobic interaction chromatography.

D. AUTOIMMUNE DISORDER STUDIES

Autoimmune diseases are conditions in which the immune system attacks normal, healthy tissues, resulting in structural and functional damage to the host. The initiation and perpetuation of diseases are unclear, and they are investigated in multi-dimensional approaches. At CBST, research is conducted to understand the pathobiology of autoimmune diseases at the molecular and cellular levels. The focus of our research activity is on characterization of the anti-
immune antibodies or anti-idiotypic antibodies and understanding of their role(s) in autoimmune pathologies. In the past, we have worked on anti-phospholipid syndrome (APS) antibodies, systemic lupus erythematosus (SLE) and rheumatoid arthritis (RA) diseases.

At present, we are working on the following -

- Rheumatoid arthritis: Understanding the molecular features of the molecules involved in the inflammation or triggered due to inflammation and their consequences.
- Neuro-immunology diseases: Here we are working on the Major Psychoses disorder, wherein a study is carried out to understand the dysregulation of the immune system and, if any, connectivity to the autoimmune disorder conditions.
- Inflammatory diseases: Neuro-inflammatory conditions and inflammatory conditions of the eyes and their autoimmunity studies are under discussion and preparation for a future project work with associated partners.

E. HIGH VALUE ADDED PROTEIN: Expression, Purification and Validation

Recombinant Therapeutic Proteins: The Centre is developing Recombinant Therapeutic proteins of very high value with a “Gene to Vial” concept. This implies the gene construction, expression, optimization of the expression systems, purification, characterization and product formulation. Three important proteins with high value were chosen. They are anti-TNF α, single-chain variable fragment (ScFv), functional Factor VIII and ApoA1.

- Functional coagulation Factor VIII (FVIII) expression has been done both in CHO and in a glycol-engineered strain of Yeast (Pichia pastoris).

- Expression and purification of anti-TNF single chain variable fragments and increasing its avidity using Chemical dimerization studies.
- Expression of anti TNF- α-ScFv in plants: Spirodela punctate or Lemna with invitro culture, growth & Expression of Lemna.
- Generation of wild type and variants of ApoA1 with studies on protection for Cardiovascular diseases with reduced effect of oxidation.

Diagnostically important proteins: We are also developing recombinant proteins that can be used in the field of Medical Diagnosis to detect diseases which would normally be very difficult to diagnose.

- Truncated HRP 2 against *Plasmodium falciparum* for the detection of Malaria.
- Recombinant HRP 3 for detection of *Plasmodium falciparum.*
- Recombinant Brucella porin for the detection of Brucellosis in humans and animals.
- Recombinant Salmonella porin for the detection of Salmonella in humans and animals.
- Recombinant COVID-19 NCP protein- For diagnostic mAb development.

F. STRUCTURAL BIOLOGY

At CBST, we use protein crystallography and associated biophysical techniques (surface plasmon resonance, Circular Dichroism) to understand the function of biological macromolecules.

We are working on the following challenges:

1. RNA Modifying Enzymes: Three-dimensional structure determination of tRNA adenosine deaminase and Dihydrouridine synthase from *Salmonella typhi*

2. Lipid A Biosynthesis Pathway: Lipid A biosynthesis is a conserved pathway which is required for the survival of nearly all Gram-negative bacteria, making this pathway an excellent antibiotic target. We are interested in elucidating the three-dimensional structure of various enzymes involved in this pathway (LpxC, LpxH, LpxL and LpxD from *Salmonella typhi*). Our long term research aim to develop small inhibitors against them.

3. Structure and functional studies Proteins in *Enterococcus faecalis* involved in the formation of biofilms (Sortase A) : *Enterococcus faecalis* (*E. faecalis*) is a Gram-positive bacterium, which is presently amongst the most prevalent multidrug-resistant hospital pathogens. Its ability to develop quorum-sensing (QS)-mediated biofilms further exacerbates its pathogenicity and triggers life-threatening infections. Sortase family proteins play an essential role in biofilm formation by *E. faecalis*. Till now three-dimensional structure of none of the sortase family proteins is known from *E. faecalis*. We aim to determine the three-dimensional structure of Sortase A and the development of tight inhibitors against Sortase A enzyme to prevent biofilm formation.

4. Understanding, biochemical studies of glycoproteins from plants.

5. Structural and functional characterization of novel vibrio antibiotic resistance (var) regulon in *Vibrio* sp.

The most widely used antibacterial agents are β-lactam antibiotics, and there is rising worry over drug resistance to these substances. A wide range of β-lactam medications, including carbapenems, are being hydrolysed by various antibiotic-resistant mechanisms in Vibrio sp. Therefore, it is crucial to understand the mechanisms underlying antibiotic resistance in Vibrio sp. We hypothesise that the structural and biochemical characterisation of two important targets of the var regulon: the transcription regulator VarR and metallo-beta-lactamase, VarG, is a prerequisite to understanding the molecular mechanism of antibiotic recognition and resistance due to the var regulon specific to Vibrio sp. Combining invitro and insilico approaches in the development of their structure-based inhibitors might increase the antibiotic sensitivity in Vibrio strains

6. Structural and functional characterization of novel toxin-antitoxin module MazE-MazF from antibiotic resistant *A.baumannii*

G. CELL CULTURE AND ANTIBODY PRODUCTION

CBST has a keen interest in producing monoclonal and polyclonal antibodies due to their significant value in modern-day diagnostics. CBST has produced and is currently producing monoclonal antibodies (mAbs) against various biological molecules of diagnostic interest for the development of rapid diagnostics for the early and specific detection of infectious diseases. CBST is also developing a mini-bioreactor module with a new super-macro porous cryogel matrix for the continuous production of monoclonal antibodies, which produces nine times more

antibodies than the conventional T-flask batch method. This cryogel work was adapted from the initial work of Prof. Ashok Kumar, IIT Kanpur. Some of the work includes,

- Monoclonal antibodies highly specific to *Plasmodium falciparum* have been developed.
- Anti-Human Serum Albumin monoclonal antibodies (Anti-HSA monoclonal antibodies) for depletion of HSA in proteomic studies.
- Antibodies against the porin protein of *Brucella* sp. and *Salmonella* sp. for specific detection of brucellosis and enteric fever & typhoid, respectively.
- Antibody against chlorinated ApoA1 (HDL) for early detection of cardiovascular diseases.
- Antibodies against COVID19 NCP for specific detection of COVID19.

H. CARDIO VASCULAR STUDIES

CBST has extensively studied and continues the search in the field of cardiovascular diseases (CVD), for understanding important and salient features of HDL, for their functions with which they are involved in various metabolic pathways that connect them to CVD.

Antibody-based targeted approaches have also been undertaken in order to develop a novel rapid diagnostic that can help to detect CVD at an early level.

A new research finding has led us to identify an *Aloe vera-based* extract that has been known to drastically reduce triglycerides and VLDL levels, significantly impacting CVD and providing a new pathway for its application as a possible therapeutic agent.

I. NATURAL PRODUCTS AND DIABETES

CBST is engaged in product development from Natural sources such as indigenous medicinal plants. Main focus is on developing Nutraceuticals with good understanding of the mechanism(s) involved in alleviating the pathology. The

Centre has already marked its success in a project using *Aloe vera* as a supplement for alleviating Diabetes.

- In-vivo studies performed in streptozotocin-induced diabetic rats with the *Aloe vera* extract.
- Extract was validated as per 'AYUSH' (regulatory structure for alternative medicine systems) guidelines.
- Human clinical trial in safety and efficacy evaluation has been carried out in collaboration with Laila Pharmaceuticals, Vijayawada.
- Understanding the molecular mechanisms of regeneration is underway, and a single molecule has been identified which is involved in one of the regeneration pathways.

J. TARGETED DRUG DELIVERY

Polymer chemistry has played an important role in the synthesis, derivation, degradation, application and evaluation of biocompatible and biodegradable polymers, which can be used as drug delivery. Many of the pharmacological properties of conventional free drugs can be improved through the use of polymeric drug delivery systems.

- Poly (ethylene oxide) [PEO]: non-toxic, ion-transporting ability, water solubility, and non-recognition by immune system. A potential polymeric delivery system.
- Bouquet structure of PEO with two ends: One holding target agent and the other holding a functional compound at the other extremities.
- Plant based anti-cancerous agent: Lupeol, extraction, identification and purification from Aloe vera. Stabilization and targeted delivery of Lupeol using PEO dendrimers.

K. PROTEIN BIOCHEMISTRY

Among the various biomolecules studied and explored, CBST focuses and has a keen interest in understanding and studying the nature of proteins for its beneficial nature from a natural source, as well as a recombinant product, for its practical purpose in various applications. At the protein biochemistry branch of science at CBST, we explore the following

- Anti-TNFα ScFV isolation, purification and characterization.
- Benzothiazole dye-based microfluidic system for amyloid detection, to develop as a diagnostic kit.
- Isolation, purification, and characterisation of recombinant proteins as expressed in monocot plant systems.

RESEARCH HIGHLIGHTS

- Published 28 articles in high-impact journals during the academic year (2024-2025)
- 2 consultancy projects obtained in the current academic year
- A total of Rs. 1.13 crores obtained as quantum of grant resources.
- Five R&D products have been developed (technology transfer with companies ongoing)

National Patents (2025)

1. Enriched polyphenols based nanoformulation for inhibiting DPP-IV enzyme activity and method of producing the same (2025): published.
2. A sensor electrode for vitamin D3 detection and a process of preparation thereof (2025): published
3. Device and method for detecting amyloids in a sample (2025): published
4. An immunogenic peptide and an assay for screening and quantifying *Salmonella typhi* specific antibodies (2025): filed
5. A sensor for Vitamin D detection and process for fabrication thereof (2025): filed.

International Patents Awarded

1. Methods for producing recombinant factor viii chains from non-filamentous fungi, their functional reconstitution and applications thereof (USA Patent) (2017)
2. Dendrimers, Conjugates And methods Thereof (USA Patent) (2017)
3. Double mutant coagulation factor VIII and methods thereof (EU Patent) (2018) – Germany and France.
4. Monolith-based pseudo-bioaffinity purification methods for Factor VIII and applications thereof (EU Patent) (2019) - Germany and France

5. Methods for producing recombinant factor viii chains from non-filamentous fungi, their functional reconstitution and applications thereof (EU Patent) (2019)- Germany and France

STUDENT & FACULTY ACHIEVEMENTS (2024-25)

- Ms. Miraclin Prasanna, Ph.D. Student - Won Dr. A.P.J Abdul Kalam award for review paper (August 2024).
- Ms. Megala U, Ph.D. Student- won Raman research award for Research paper (July 2024)
- Mr. Harun Rashid M.D, Ph.D. Student - Won Young Budding scientist award by SRMIST Chennai (February 2025).
- Mr. Harun Rashid M.D, Ph.D. Student - Won Dr. A.P.J Abdul Kalam award for review paper (December 2024).
- Ms. Bhagya Jyothi J L , Ph.D. Student - Won Dr. A.P.J Abdul Kalam award for review paper (April 2025).
- Ms. Vishakha R. Chakole, Ph.D. Student - First position in Demo day by the Institution' innovation council, VIT Vellore (January 2025).
- Dr. Immanuel Dhanasingh, Associate Professor from the Centre for Bioseparation Technology (CBST) has been selected by the French Institute in India (IFI), Embassy of France in India, to receive funding for his proposed research trip to France under the Scientific High Level Visiting Fellowships (SSHN) 2025 programme.
- International Association of Advanced Materials (IAAM; a Sweden based Non-Profit Scientific Research Organization) has awarded Dr. Kali Kishore Reddy (Assoc. Prof.) from the Centre for Bioseparation Technology (CBST) with the "IAAM Young Scientist Award" for his contributions in the area "Advanced Porous Materials"

CONFERENCES, INTERNSHIPS & WORKSHOPS

- One day international workshop on "From molecules to models: integrating systems and computation in biophysics" was held on 8th November, 2024
- Summer Internship program 2025, CBST, VIT Vellore (May-June 2025)

SERVICES PLATFORM

- Mass spectrometry sample analysis: CBST encourages sample analysis to be performed for VIT residents and outsiders.
- BIACORE 3000 SPR: Using Surface Plasmon Resonance, it is possible to calculate the binding affinity, such as protein-protein interactions.
- Both monoclonal antibody and polyclonal antibody production in mice and rabbits, respectively, are rendered for antibody production with a defined collaboration.
- Purification experiments are designed at lab-scale, and scale-up advising is also provided.
- Molecular biology service platforms (protein expression) are also available at CBST.
- Structural-based drug designing through in silico and in vitro approaches.

REACH US

Centre for BioSeparation Technology (CBST)

6th Floor, Technology Tower

Vellore Institute of Technology - Vellore

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