



**VINAYAKA MISSION'S  
RESEARCH FOUNDATION**  
(Deemed to be University under section 3 of the UGC Act 1956)



**AVMC**  
AARUPADAI VEEDU MEDICAL COLLEGE



**CBR**  **MULTI-DISCIPLINARY  
CENTER FOR BIOMEDICAL RESEARCH**

The Mutli-disciplinary Center for Biomedical research Facility has been established at Aarupadai veedu medical college & hospital, Vinayaka Missions Research foundation-Deemed to be University (VMRF-DU). This facility will enable our multi-disciplinary research team's namely basic biomedical research, health services, bioinformatics, Yoga therapy, Audiology and Speech therapy, Physiotherapy, and Engineering – to work together to develop solution to the present existing needs.

## **Vision**

Education, Training and Consultancy to excel in healthcare through bio-medical Research.

## **Mission**

- To promote basic and applied research in the field of medical and allied sciences.
- To train the students, next generation researcher and faculty through our Bio-medical research facility.
- To facilitates the collaboration across various disciplines- notably with bioinformatics and Engineering.
- To provide strategic consultancy to academia and industry in the field of Biomedical Sciences.

# TRUST AREA



## DIAGNOSTICS

- Transfusion transmissible infectious disease
- Antenatal Obstetric complication



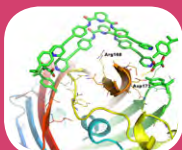
## CYTOGENETICS & DIAGNOSTICS

- Screening of Genetics disorders
- Genetic Counselling



## BIO-NANOTECHNOLOGY

- Biosensor development
- Green Synthesis of Nanoparticles



## BIOINFORMATICS

- Drug –Protein/DNA interaction



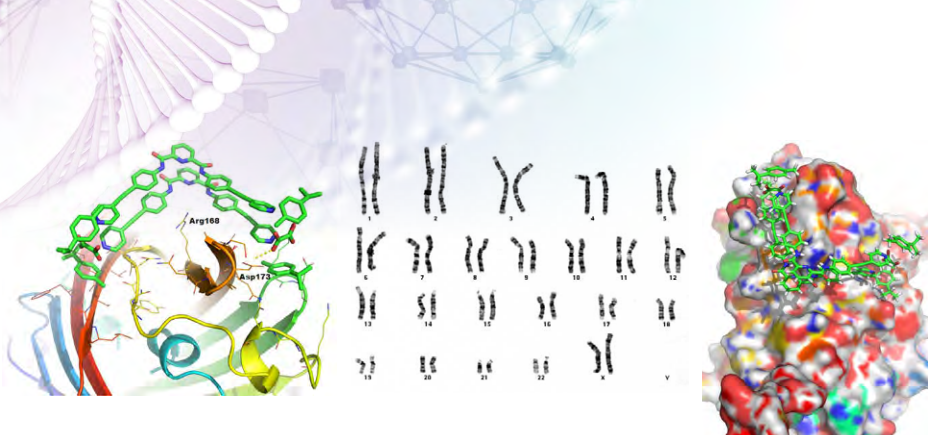
## DEVELOPMENTAL & EVIDENCE BASED THERAPEUTICS

- Psychrophilic marine organism based therapeutics
- Stem Cell Research & Cancer Biology

## Facilities available at the center

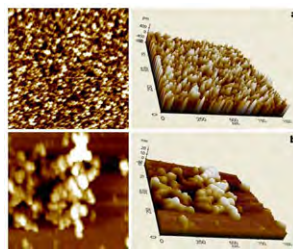
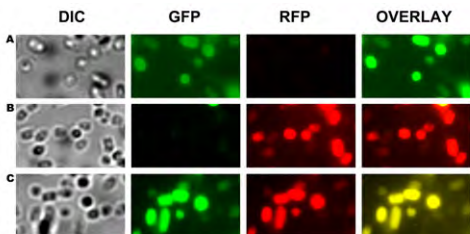
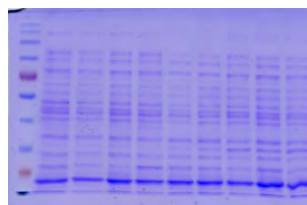
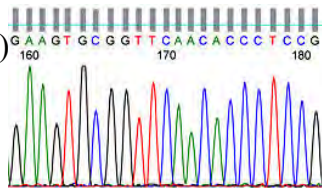
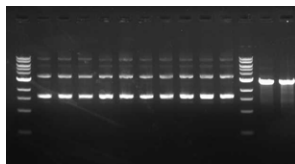
- ❖ Applied Biosystems quant studio 5 Real-time PCR from thermos fisher scientific
- ❖ Athenese Real Time PCR
- ❖ Verti PCR from thermos fisher scientific
- ❖ Biosafety cabinet from TECH
- ❖ Mini protean tetra cell from Bio Rad
- ❖ Mini sub cell GT system from Bio Rad
- ❖ Semi -Dry Electrophoretic transfer cell from Bio Rad
- ❖ Gel- Documentation
- ❖ Eppendrof Bio pHotometer D30
- ❖ COSLAB Fluorescent Microscope
- ❖ Laminar flow hood
- ❖ Minispin centrifuge and Non- refrigerated centrifuge from REMI
- ❖ Deep freezer (-80 °C)
- ❖ Deep freezer (-20 °C)
- ❖ Cooling incubator
- ❖ Eppendrof Micro-centrifuge
- ❖ Eppendrof Cooling Micro-centrifuge
- ❖ 3D printer (Dreamer )
- ❖ 3D printer ( Ultimaker )
- ❖ Western blotting
- ❖ Co<sub>2</sub> incubator





**The facility is enabled with capabilities for**

- DNA, RNA and Protein analysis
- Protein blotting (western)
- Quantitative analysis of gene expression
- Genetic screening (diagnostic and research)
- Development of Biomarkers
- Microbial culture and characterization
- Cell imaging and visualization
- Nanoparticles and nanosensors
- Drug-protein interaction study
- Cytogenetic technique
- (-80oC) Deep freezer



**Extramural Funding Agency**

1. Total Number of projects Sanctioned: **4**

Department	Name of the Project	Principal Investigator	Co - Investigator (s)	Amount Sanctioned (Rs.)	Status
Microbiology	Defining the AMR burden of antimicrobial manufacturing waste in puducherry and Chennai	Dr. R. Latha	Dr. S. Ravikumar	<b>24,15,760/-</b>	Approved
ENT	A genetic screening to identify the association between consanguineous marriage with deafness in Indian population	Dr. S. Arulmozhi	Dr. S. Ravikumar	<b>11,60,000</b>	Approved
Biochemistry	Association between pitx2, gata-4 snp polymorphisms and atrial fibrillation in young adult population- a prospective case control study	Dr. S. Ravikumar	Dr. Vithiyavathi Mr. R. R. Kumar	<b>10,08,000</b>	Approved
Biochemistry	Characterization of Leptospiral OMPs in search for novel immunogenic adhesions having significance in the diagnosis and pathogenesis of Leptospirosis	Dr. S. Ravikumar	Dr. R. Latha	<b>23,44,200</b>	Technically Accepted



## ICMR STS 2015 - 2016

No	Project Name	Students Name	Guide
ICMR STS 2019 - 2020			
1	Association between Leptin gene (G2548A) polymorphism and Ayurveda Prakriti in healthy young adult population	Mr. Sourav Musib	Dr. Ravikumar. S
2	A study on prevalence of Hypervirulent Klebsiella pneumoniae infection and their antimicrobial resistance pattern in a tertiary care hospital at Puducherry	Ms. Swetapadma Mishra	Dr. Kavita. K/ Dr. Ravikumar. S
3	Influence of environmental conditions on DNA extraction for the use in forensic identification	Mr. Sankarshan	Dr. Arthy A/ Dr. Ravikumar. S

**ICMR - MD/MS (2020-2022)**

<b>1</b>	Association of Metabolic Syndrome and Insulin Resistance in Middle Aged Men with Androgenic Alopecia	Dr. Ilakkia Priya Sadasivam	Dr. J. Govardhan/ Dr. Ravikumar. S
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**MOU SIGNED FOR RESEARCH COLLABORATION**

Title of the MOU	Name of the Partnering institution/ Industry	Year of Commencement
Memorandum of Understanding between AVMC and 30M GENOMICS concerning submission of Joint research proposals for external funding, as an industrial partner	30m Genomics private limited, India	2020
Memorandum of Understanding between AVMC and Sognef Inc. concerning Research Collaboration.	Sognef Inc. USA	2020



## Research Project in Center for Biomedical Research

Projects		S.No.	Project lists
Extramural funding	1	1	Defining the AMR burden of antimicrobial manufacturing waste in puducherry and Chennai
	2	2	Association between pitx2, gata-4 snp polymorphisms and atrial fibrillation in young adult population- a prospective case control study
	1	1	Association between PITX2 SNP polymorphisms and Atrial fibrillation in young adult population- A prospective case control study
	2	2	Risk Assessment of Gene variants involved in bilirubin metabolism for Neonatal Hyperbilirubinemia in South India
Intramural funding	3	3	Association of IL-17 pathway gene variants with childhood asthma
	4	4	Association between Leptin gene (G2548A) polymorphism and Ayurveda Prakriti in healthy young adult population
Seed Money Project	5	5	Association of <i>IL-17</i> gene variants with childhood asthma in South Indian population
	6	6	The environmental, genetic and dermatoglyphic study of Down-syndrome and Autism Children and evaluation of pre - post treatment of audio-speech language pathology in and around Pondicherry - Union Territory of Pondicherry
	7	7	Study of the prevalence & Geographical distribution of Dengue Virus Infection among rural and urban population of Puducherry.
	8	8	A Prospective cross sectional study of prevalence of high risk HPV infection in cervical smear among adult females in tertiary care center Puducherry.

**Research Project in Center for Biomedical Research**

1	Identification of genetic risk factors of preeclampsia in Indian women - A case control study
2	Association of Human Leukocyte Antigen (HLA) class I genetic variations with severe cutaneous adverse reactions (SCARs) in Indian population
3	Attenuation of streptozotocin-induced diabetic nephropathy and pancreatic islet injury in albino Wistar rats by baecalin
4	Investigation of active peptide derived from tissue regenerating starfish for mechanistic potency in zebrafish (Danio rerio) cell lines.
5	Fabrication and functionalization of 3D soft Cryogel Bio scaffold and hard PLA scaffolds coated with growth factors for bone Stem Cell Therapy
1	Role of Megsin and Oxidative Biomarkers in Diagnosis and Prognosis of Liver Cirrhosis
2	Obesity and Genetic Susceptibility to Atrial Fibrillation among Puducherry Population - Nutrigenomic Approach.
3	Role of Serpinb 11 in progression of chronic kidney Diseases - A Multi - omic approach.
4	Identification of clinical stage - specific differential expression of proteomics in colorectal cancer
<p><b>Research Associate project</b></p> <p><b>Ph.D., Scholar</b></p>	

## Research Project in Center for Biomedical Research

ICMR STS	1	DNA isolation from different sources simulating crime scene
DBT	1	Defining the AMR burden of antimicrobial manufacturing waste in puducherry and Chennai
ICMR – MD/MS	1	Association of Metabolic Syndrome and insulin Resistance in Middle Aged Men with Androgenic Alopecia
MD	1	Characterization of Helicobacter pylori and its Antimicrobial Susceptibility pattern from Patients with Upper Gastrointestinal Disorders in Tertiary Health Care Hospital.
	2	A study on the Conventional and Molecular Approaches for the Identification and Antimicrobial Susceptibility Pattern of Pseudomonas Aeruginosa in Diabetic Foot Ulcers.

**Ongoing Funded Research Project in Center for Biomedical Research**

Name	Position	Department	Project undertaken
Dr. S. Thiyagarajan	Research Associate	Multi-Disciplinary Center for Biomedical Research	<p>Clinical and molecular characterization of Panton- Valentine Leukocidin (PVL) positive <i>Staphylococcus aureus</i> from skin and soft tissue infections from a tertiary care hospital in Puducherry</p> <p>Evaluation of interferon induced <i>Myxovirus</i> resistance protein A as a potential biomarker for differentiating viral from bacterial in acute febrile patients with respiratory tract infection</p> <p>Prevalence of drug resistance, molecular characterization and antimicrobial susceptibility pattern of <i>Pseudomonas aeruginosa</i> in Diabetic foot ulcers using Real Time PCR</p> <p>A prospective cross sectional study of prevalence of high risk HPV infection in cervical smear among adult females in tertiary care center, Puducherry</p> <p>Study of the prevalence and geographical distribution of Dengue virus infection among rural and urban population of Puducherry</p>
Dr. M. Aarthi	Research Associate	Multi-Disciplinary Center for Biomedical Research	<p>Association between <i>PITX2</i>, <i>GATA-4</i> SNP polymorphisms and Atrial fibrillation in young adult population- A prospective case control study</p> <p>Risk Assessment of Gene variants involved in bilirubin metabolism for Neonatal Hyperbilirubinemia in South India</p> <p>Association of IL-17 pathway gene variants with childhood asthma</p> <p>Association between Leptin gene (G2548A) polymorphism and Ayurveda Prakriti in healthy young adult population</p>

<b>Dr. M. Aarthi</b>	Research Associate	Multi-Disciplinary Center for Biomedical Research	DNA isolation from different sources simulating crime scene
			Identification of genetic risk factors of preeclampsia in Indian women – A case control study
<b>Dr. N. Prithiviraj</b>	Research Associate	Multi-Disciplinary Center for Biomedical Research	Association of Human Leukocyte Antigen (HLA) class I genetic variations with severe cutaneous adverse reactions (SCARs) in Indian population
			Attenuation of streptozotocin-induced diabetic nephropathy and pancreatic islet injury in albino Wistar rats by baecalin
			Association of IL-17 gene variants with childhood asthma in South Indian population
			The environmental, genetic and dermatoglyphic study of Down-syndrome and Autism Children and evaluation of pre – post treatment of audio-speech language pathology in and around Pondicherry-Union Territory of Pondicherry
<b>Mr. N. Raajesh Anand</b>	Ph.D. Scholar	Multi-Disciplinary Center for Biomedical Research	Investigation of active peptide derived from tissue regenerating starfish for mechanistic potency in zebrafish (Danio rerio) cell lines.
			Fabrication and functionalization of 3D soft Cryogel Bio scaffold and hard PLA scaffolds coated with growth factors for bone Stem Cell Therapy.
<b>Mr. Nelaturi Prabhu Dasu</b>	Ph.D. Scholar	Multi-Disciplinary Center for Biomedical Research	Identification of clinical stage-specific differential expression of proteomics in Colorectal cancer.
<b>Mr. S. Mohan</b>	Ph.D. Scholar	Multi-Disciplinary Center for Biomedical Research	Role of Megsin and Oxidative Biomarkers in Diagnosis and Prognosis of Liver Cirrhosis
			Obesity and Genetic Susceptibility to Atrial Fibrillation among Puducherry Population - Nutrigenomic Approach.
<b>Ms. Sangeetha P.K</b>	Ph.D. Scholar	Multi-Disciplinary Center for Biomedical Research	Role of Serpinb 11 in progression of chronic kidney Diseases - A multi omic approach.

**Publication list for Centre for Biomedical Research**

S.No.	Title of the Paper	Name of the Journal	Year	Faculty	Indexed
1	Effect of Therapeutic Hypothermia on the Outcome in Term Neonates with Hypoxic Ischemic Encephalopathy--A Randomized Controlled Trial	Journal of Tropical Pediatrics	2021	R Christina Catherine, Vishnu Bhat Ballambattu, Bethou Adhisivam, Shruthi K Bharadwaj, Chinnakali Palanivel	Pubmed
2	Global DNA Methylation in Cord Blood and Neurodevelopmental Outcome at 18 Months of Age among Intrauterine Growth Restricted and Appropriate for Gestational Age Infants	Journal of Tropical Pediatrics	2021	Krishna Rao Gurugubelli 1, Vishnu Bhat Ballambattu ,Zacheriah Bobby	Pubmed
3	Right Ventricular Infarction - A Clinical Study	International Journal of Current Research and Review		Arunkumar S, Sakthivel V, Babu RP, Jha SJ, Prithiviraj	Scopus
4	Does oropharyngeal administration of colostrum reduce morbidity and mortality in very preterm infants? A randomised parallel-group controlled trial	Journal of Paediatrics and Child Health	2021	Rahul Aggarwal, Nishad Plakkal, Vishnu Bhat	Pubmed
5	Bilateral Puffy Orbits in a toddler: Therapeutic Challenges	Indian Journal of Otolaryngology and Head & Neck Surgery	2021	N Rajarajeswari, Mary Kurien, Sithananda Kumar, Jaise Jacob, RG Arthy & Vishnu Bhat	Pubmed

S.No.	Title of the Paper	Name of the Journal	Year	Faculty	Indexed
6	Role of Zinc in Neonatal Sepsis	Indian Journal of Pediatrics	2021	Newton Banupriya 1, Ballambattu Vishnu Bhat , Magadi Gopalakrishna Sridhar 3	Pubmed
7	The impact of the COVID-19 pandemic on the academic research- Short review	Annals of the Romanian Society for Cell Biology	2021	Prithiviraj Nagarajan , Sathesh Kumar Sabapathy Ramachandran Kaliaperumal , Ravikumar Sambandam	UGC/ Scopus
8	Study of Neutrophil-To-Lymphocyte Ratio and its Correlation with Glycaemic Status in Diabetic Senile Cataract Patients	Annals of the Romanian Society for Cell Biology	2021	Ramachandran Kaliaperumal, Prithiviraj Nagarajan , Kumar Rangarajalu, Mohan Sivanandham, Sathesh Kumar Sabapathy	UGC/ Scopus
9	Challenges in Neonatal COVID-19 Infection	The Indian Journal of Pediatrics	2020	B. VishnuBhat & Sambandam Ravikumar	Pubmed
10	Effective Non-verbal Communication	Effective Medical Communication- Springer book	2020	B. Vishnu Bhat, Manoj Kumar Kingsley	Pubmed



S.No.	Title of the Paper	Name of the Journal	Year	Faculty	Indexed
11	Anti-diabetic (AD) studies of picolinium maleate Nano crystals	Materials Today: Proceedings	2020	K. Senthil Kannan , Prithiviraj Nagarajan , G. Flora	Scopus
12	Anti-diabetic (AD) studies of bis-glycine hydro bromide (45 nm) Nano crystals	Materials Today: Proceedings	2020	K. Senthil Kannan, S. Gayathri Devi, Prithiviraj Nagarajan , G. Flora	Scopus
9	Phylogeographer and genetic analyses of novel covid-19 reveals divergence with other corona virus family	Journal Of Xidian University	2020	Satheesh Kumar Sabapathy, Prithiviraj, Vishnu Bhat, Prabhu Das.	Scopus
10	COVID-19 infection among children - Pathogenesis, treatment and outcome	Journal of Pediatric Intensive Care	2020	Krishna Rao Gurugubelli, Ballambattu Vishnu Bhat.	Scopus
11	Curious scenario of changes in incidence of preterm births during COVID-19 pandemic. Pointers for future research	European Journal of Obstetrics & Gynecology and Reproductive Biology	2020	Thirunavukkarasu Arun Babu, Vijayan Sharmila, B. Vishnu Bhat,	Scopus
12	Recent technologies enhancing the clinical utility of circulating tumour DNA	Clinica Chimica Acta	2020	Dr. Aarthi M, Ravikumar S, Vishnu Bhat	Pubmed
13	Swarna Bindu Prashana - An ancient Approach to Improve the Infant's Immunity	Biological Trace Element Research	2020	Prabhudas Nelaturi , Prithiviraj Nagarajan , Satheesh Kumar Sabapathy , Ravikumar Sambandam	Pubmed

S.No.	Title of the Paper	Name of the Journal	Year	Faculty	Indexed
14	Effect of Therapeutic Hypothermia on the Outcome in Term Neonates with Hypoxic Ischemic Encephalopathy – A Randomized Controlled Trial	Journal of Tropical Pediatrics	2020	R Christina Catherine, M.O.T, Vishnu Bhat Ballambattu, Bethou Adhisivam, Shruthi K Bharadwaj, DM, Chinnakali Palanivel,	Scopus
15	Neurodevelopmental Outcome of Preterm New-borns with Abnormal Umbilical Artery Doppler -A Prospective Cohort Study	The Indian Journal of Pediatrics	2020	Kohat, Dilesh & Keepanasseril, Anish & Chinnakali, Palanivel & Mondal, Nivedita & Bhat, Ballambattu.	Pubmed
16	Association of serum magnesium with oxidative stress in the pathogenesis of diabetic cataract	Biological Trace Elements Research	2020	Ramachandran Kaliaperumal, Prithiviraj Nagarajan , Satheesh Kumar Sabapathy	Pubmed
17	Molecular mechanics and quantum chemical calculations unveil the combating effect of baicalin on human islet amyloid polypeptide aggregates	Molecular Simulation	2019	E. Srinivasan, S. Ravikumar, S. Venkataramanan, Rituraj Purohit & R. Rajasekaran	Scopus

# Multi- Disciplinary Center For Biomedical Research Faculty



**Dr. B. Vishnu Bhat**  
Director- Medical Research



**Dr. S. Ravi kumar**  
Principal scientist



**Dr. G. Subash Chandra Bose**  
Statistician



**Dr. S. Thiyagarajan**  
Research Associate



**Dr. M. Aarthi**  
Research Associate



**Dr. N. Prithivi raj**  
Research Associate



**Mr. G. Mahalingam**  
office in-charge



**Ms. S. Punithavathi**  
Lab Technician

## Ph.D candidates

<b>Mr. Nelaturi Prabhu Dasu</b>	Ph.D. Scholar
<b>Ms. Sangeetha P.K</b>	Ph.D. Scholar
<b>Mr. S. Mohan</b>	Ph.D. Scholar
<b>Mr. N. Raajesh Anand</b>	Ph.D. Scholar

## Academics Programmes engaged

- Ph. D /PG Scholars (Molecular Biology)  
Ph.D scholars registered under mCBR - 4
- UG / PG Research Methodology course offered to ASLP and BPT

## Capacity Building Programmes

1. Selection of research question, research process, process of writing a research proposal, scientific writing for thesis and research publications
2. Review of Literature
3. Types of study (Case-control studies, Cohort studies, Interventional studies)
4. Statistical methods
5. Ethics and biomedical research
6. Through Research methodology workshop, we have sensitized need-based molecular level research among PG medical Students.



## Conference / Workshop/ Seminar organized

### The second mCBR Hands-on training on basic molecular biology techniques and their applications

The second mCBR workshop on “Basic Molecular Biology Techniques and Their Applications” was organized at Multi-Disciplinary Center for Biomedical Research, Aarupadai Veedu Medical College and Hospital, Vinayaka Mission’s Research Foundation between 15<sup>TH</sup> and 17<sup>TH</sup> February 2021. The primary objective of the workshop was to impart both theoretical and practical knowledge on the methods of isolation of DNA, RNA and proteins, polymerase chain reaction, and SDS-PAGE to study the gene or protein of their interest and Real-time PCR technique in the analysis of single nucleotide polymorphisms.



*Workshop inauguration and souvenir release by the dignitaries*



*The organizing team with the participants*

## PATIENT CARE

- Molecular diagnostics helps to screen the patient with genetic disorders.
- Genetic screening protocols for use in routine diagnosis for infectious diseases
- Genetic Counseling elucidates the patient on genetic diseases.

## Future Plans

### RESEARCH

- Establishment of NAT in screening infectious disease
- In-silico therapeutics: Drug target identification
- Psychrophilic marine based therapeutics

## DEVELOPMENT PROGRAMMES

- Integrated research promotion among Undergraduate medical students- (RACK)
- Hands-on-Training - Molecular Biology techniques and Bioinformatics for UG, PG and faculty
- Seminars - Current trends in Biomedical Research.
- Industrial/academic training





# VINAYAKA MISSION'S RESEARCH FOUNDATION

(Deemed to be University under section 3 of the UGC Act 1956)

## VISION

To achieve excellence in education and make education as a tool for social change for the betterment of the society.

## MISSION

To spread education globally in the field of medicine, dentistry, paramedical, homeopathy, engineering, management and basic sciences.

## QUALITY POLICY

Prepare the students with knowledge, skill and competence to stand up to any challenges in the spheres of Medicine and its allied fields Dentistry, Engineering and Technology, Management, Basic Sciences and Humanities and expose them to the changing global trends of knowledge and technology.

Grow as an Institution of Excellence internationally and improve continually to match the needs of global challenges and trends in all spheres.



# AVMC

AARUPADAI VEEDU MEDICAL COLLEGE

## VISION

Imparting quality medical education for the betterment of the society

## MISSION

A center of excellence offering medical education for the students & contributing to the society, nation & the world.

**Dr. Sambandam Ravikumar**

*Principal Scientist,*

**MULTI-DISCIPLINARY CENTER FOR BIOMEDICAL RESEARCH (CBR)**

**AARUPADAI VEEDU MEDICAL COLLEGE & HOSPITAL** (College Block)

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