

CBCMT

Pulse

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VIT[®]

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

A Yearly Newsletter from CBCMT

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From Director's Desk



Dear Readers,

It is with immense pride and honor that I, as the Director of the Cellular and Molecular Theranostics Center (CBCMT) at VIT, Vellore, unveil the much-anticipated Newsletter encapsulating the noteworthy achievements of our center during the academic year 2022-2023. Since its inception in 2016, CBCMT has been unwavering in its commitment to amplify the vision of VIT by delving into the intricate realm of Cellular and Molecular Theranostics through Biomaterials.

Our journey has been marked by a relentless pursuit of excellence, creativity, innovation, and a passion for groundbreaking research. The accolades earned by CBCMT in the past year are a testament to our collective dedication and pursuit of excellence. Our triumphs include securing research grants amounting to an impressive 10 crores INR from esteemed national and international agencies, filing three patents, embarking on an industrially collaborative project, and successfully delivering a startup. Additionally, we take pride in contributing over 80 high-quality, peer-reviewed articles to reputable journals. I extend my heartfelt congratulations to every member of CBCMT for their unwavering commitment to excellence, propelling the center to new heights. A warm welcome is also extended to our newly joined faculty members and the bright minds entering our fold. I wish them to resound success in their endeavors. This journey would not have been possible without the steadfast support of the VIT management, particularly during the challenging times imposed by the COVID-19 pandemic. Their generosity in providing grants has been instrumental in fortifying CBCMT with state-of-the-art equipment, enhancing infrastructural facilities, and sustaining our persistent interest of research excellence. As we reflect upon the milestones of the past year, I am confident that CBCMT will continue to script a legacy of brilliance in the years ahead. Anticipating even greater accomplishments and breakthroughs, I extend my gratitude for your continued support and enthusiasm for CBCMT's remarkable journey.

Warm Regards

Dr. Geetha Manivasagam

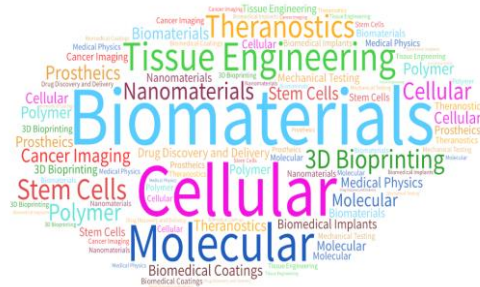
Director

Centre for Biomaterials, Cellular and Molecular Theranostics (CBCMT)



About CBCMT...

Centre for Biomaterials, Cellular and Molecular Theranostics (CBCMT) was established in the year 2016 as an integral part of VIT, under the able leadership of Prof. Geetha Manivasagam. This interdisciplinary research centre works on cutting edge technologies at the interface of physical, biological, chemical and engineering sciences. The research team comprises of material scientists, biologists, physicists, mechanical engineers, bioengineers, chemists and clinicians, who collaborate to address the unmet needs in the areas of biomaterials, cellular and molecular theranostics. Some of the primary focus areas include soft and hard tissue engineering, in vitro model of bone tumors, dental materials, biocorrosion, biomechanics, drug discovery, sensors for microbe detection and implant for health monitoring.



CBCMT is equipped with cutting-edge instruments to conduct experiments ranging from material synthesis, material processing, characterizations, evaluating performance of medical implants through tribocorrosion, mechanical characterization and wettability, as well as advanced cell culture experiments. CBCMT's HOME (Human Organ Manufacturing and Engineering) Lab is an advanced 3D bioprinting facility equipped with bioprinters, cell culture facility and a Confocal Laser Scanning Microscope. The ongoing projects of the centre are funded by both national and international funding agencies. The centre also has a strong research collaboration with clinicians and scientists from leading research laboratories within India as well as across the globe.



CBCMT thrives to be the hub of translational research in order to address the unmet needs in treating several critical disorders through cutting edge technologies

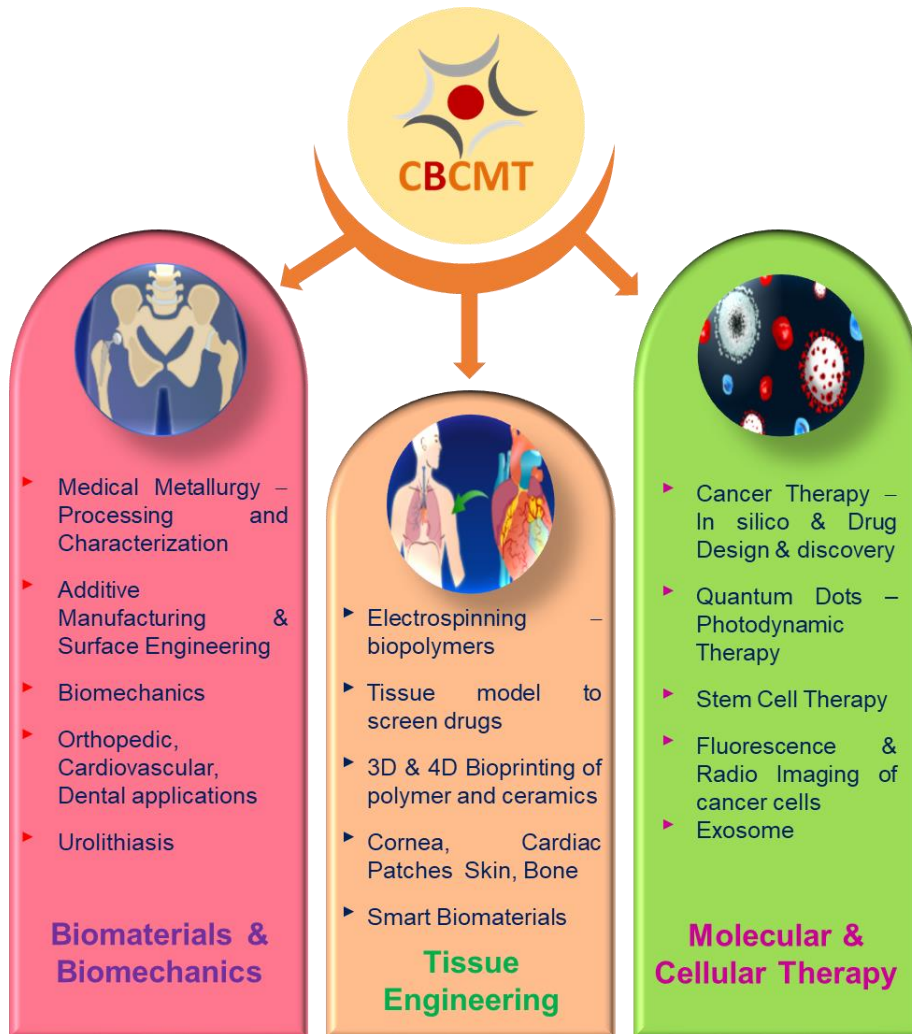


To provide state-of-the-art health-care options for patients by developing efficient, cost-effective and safe treatment strategies through multi-disciplinary research

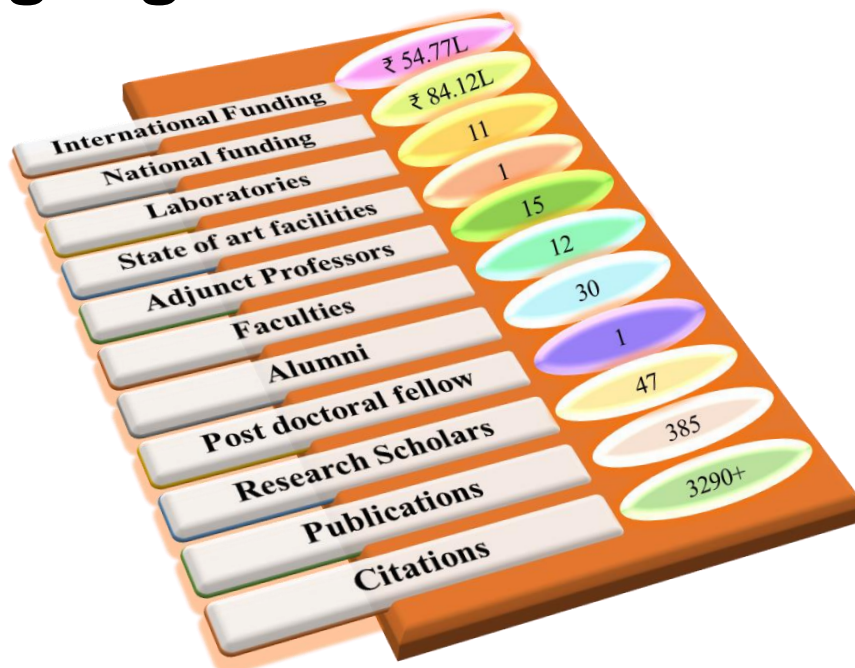


Quality - Excellent research with translational impact
Growth - Innovation, continued development and improved performance
Integrity - Maintaining highest standard of ethics in research
Accountability - Social and scientific responsibility

Research Focus



Highlights of CBCMT



Key Publications



- Li G, Liu S, Chen Y, Zhao J, Xu H, Weng J, Yu F, Xiong A, Anjaneyulu U, Wang D, Liu P. An injectable liposome-anchored teriparatide incorporated gallic acid-grafted gelatin hydrogel for osteoarthritis treatment, *Nature Communications*, 14 (2023) 3159.
- Khan P.A., Thoutam A.K., Gopal V., Gurumallesh A., Joshi S., Palaniappan A., Markocsan N., Manivasagam G., Influence of Graphene Nanoplatelets on the Performance of Axial Suspension Plasma-Sprayed Hydroxyapatite Coatings, *Bioengineering*, 10 (2022) 44
- Pramote T., Yusuke O., Vishnu J., Praveenkumar K., Ansheed RA, Manivasagam G., Shankar KV, Makoto H., Sato S. Superior Fretting Wear Resistance of 30Nb5Ta30Ti15V20Zr Refractory High Entropy Alloy in a Comparison with Ti6Al4V. *Materials Letters*, 339 (2023) 134105.
- Govind., Praveenkumar K., Vignesh R., Vishnu A., Vishnu J., Manivasagam G., Shankar KV. Fretting Wear Behavior of Al-Si-Mg-Ni Hypoeutectic Alloy with Varying Solutionizing Time. *Silicon*. 15 (2023) 4193.
- D. Anandan, A. Kumar, M.N. Jeyakkani, D.B. Inja, A.K. Jaiswal, Investigation of Giant Cell Tumor of Bone and Tissue Engineering Approaches for the Treatment of Giant Cell Tumor of Bone, *ACS Applied Bio Materials* 6 (2023) 3946.
- C. Manikandan, A.K. Jaiswal, Scaffold-based spheroid models of glioblastoma multiforme and its use in drug screening, *Biotechnology & Bioengineering*, 120 (2023) 2117.
- V K Anupama, A. Udduttula, A.K. Jaiswal, Unveiling the secrets of marine-derived fucoidan for bone tissue engineering-A review, *Frontiers in Bioengineering and Biotechnology*, 10 (2023) 7.
- Akshaya. S, Rowlo, P.K, Dukle, A. and Nathanael, A.J., Antibacterial coatings for titanium implants: Recent trends and future perspectives. *Antibiotics*, 11 (2022) 1719.
- Sreena.R, Nathanael,A.J, Biodegradable Biopolymeric Nanoparticles for Biomedical Applications-Challenges and Future Outlook, *Materials* ,16 (2023) 2364.
- Sheng W, Qin H, Wang T, Zhao J, Fang C, Zhang P, Liu P, Anjaneyulu U, Zeng H, Chen Y. Advanced phosphocreatine-grafted chitosan hydrogel promote wound healing by macrophage modulation, *Frontiers in Bioengineering and Biotechnology*, 12 (2023) 1199939.
- Teng B, Yu XF, Li J, Udduttula A, Ismayil A, Huang X, Li J, Zhao PY, Kerem G, Long J, Liu C. Cervical vertebrae for early bone loss evaluation in osteoporosis mouse models, *Quantitative Imaging in Medicine and Surgery*. 13 (2023) 2466.
- SK Hema, A Karmakar, R K Das, Priyanka Srivastava, Simple formulation and characterization of double emulsion variant designed to carry three bioactive agents, *Heliyon*, 8 (2023) 8-9.
- S Chakraborti, A Karmakar, R Guha, C Ngan, RK Das, N Whitaker, Induction of epithelial to mesenchymal transition in HPV16 E6/E7 oncogene transfected C33A cell line, *Tissue and Cell* 82 (2023) 102041.
- S Saraf, PK Suresh, RK Das, Unravelling the role of EMT in OSCC: A quick peek into HPV-mediated pathogenesis, *Oral Oncology Reports*, 5 (2023) 100016.
- Dhanashree M., Vasanth M., Balaji P., Loganathan R., Nanoparticle enhancement of natural killer (NK) cell-based immunotherapy, *Cancers*, 14 (2022) 5438.
- Dhanashree M., Loganathan R., Pooled evidence from preclinical and clinical studies for stem cell-based therapy in ARDS and COVID-19, *Mol Cell Biochem* 478 (2023)1487–1518.
- Rohin Shyam, Arunkumar Palaniappan. Effect of sterilization techniques on biomaterial inks' properties and 3D bioprinting parameters. 33 (2023) e00294.
- KalaiPriya R., Selvaganapathy G., Purnimajayasree R., Maya B., Thangavelu K., Arunkumar P. Molecularly Imprinted Polymer-Based Biomimetic Systems for Sensing Environmental Contaminants, Biomarkers, and Bioimaging Applications. *Biomimetics*. 8 (2023) 245.
- Selvaganapathy G., KalaiPriya R., Thangavelu K., Arunkumar P. Recent Advances in Two-Dimensional MXene-Based Electrochemical Biosensors for Sweat Analysis. *Molecules*, 28 (2023) 4617.
- Saravanan R., Kavitha G., Arunkumar P. TiO₂ nanostructures – a double edged sword: current progress on their role in stem cells' differentiation, cancer therapy, and their toxicity issues. *Nanotoxicology*17 (2023) 176-201.

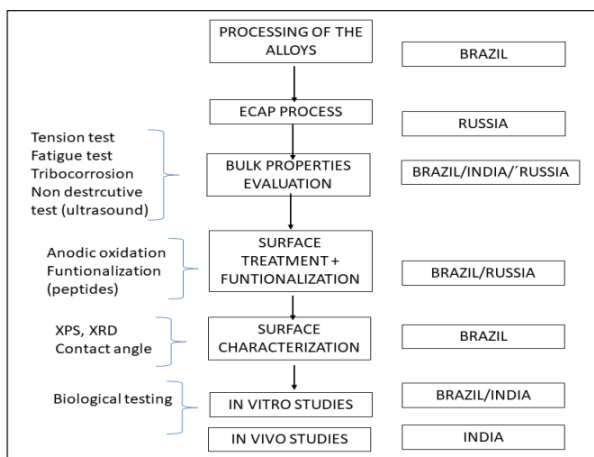
Patents

1. "Process of Manufacturing a Ti-Based Implant with Improved Surface Properties" Application number: 201941005757. Inventor: 1. Dr. Geetha Manivasagam
2. Novel Cell Secretomes For Wound Healing, Patent No: 419521, Granted: 30/01/2023, Inventors: 1. Jayesh Bellare, 2. Hemalata Chhabra 3 Amit Kumar Jaiswal 4.V.P. Kale, 5. Meghana Kanitkar, 6. Rocha Shukla
3. A Composition of A Bone Bio-cement And A Process Of Preparation Thereof Date of Filing: 13/07/2021, Date of Grant: 2023, Application No: 202141031345, Inventors: 1. Vidul Goenka, 2. Amit Kumar Jaiswal.
4. Schiff's base-based hydroxyapatite and its preparation thereof, Date of Filing: 07-10-2023, Application No: 202341067311, Inventors: 1. Dr. Amit Kumar Jaiswal, 2. Anupama Devi V K



Funded Projects

Dr. Geetha Manivasagam



Title: Functionalization of new titanium alloys after ECAP processing and surface treatment.

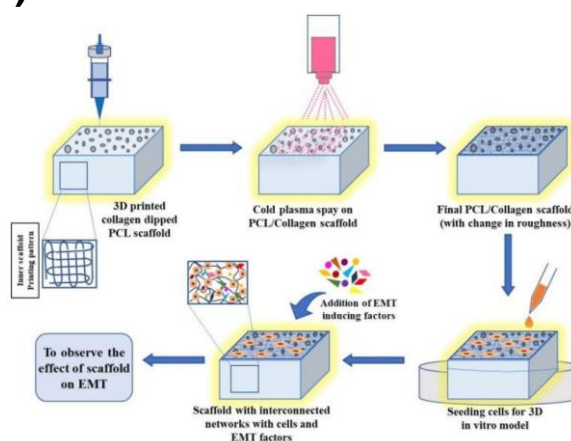
Funding Agency: DST- BRICS.

Period: 2023-26.

Amount: INR 48,17,580/-.

Dr. Amit Kumar Jaiswal (PI)

Dr. Raunak Kumar Das (Co-PI)



Title: Regulation of epithelial-mesenchymal transition in oral squamous carcinoma with an *in-vitro* model using 3D printed polycaprolactone – collagen scaffold.

Funding Agency: ICMR.

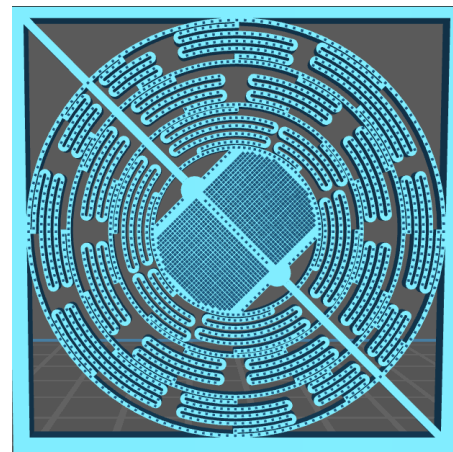
Period: 2022-25.

Amount: INR 29,49,000.

Funded Projects



Dr. Arunkumar Pitchaimani



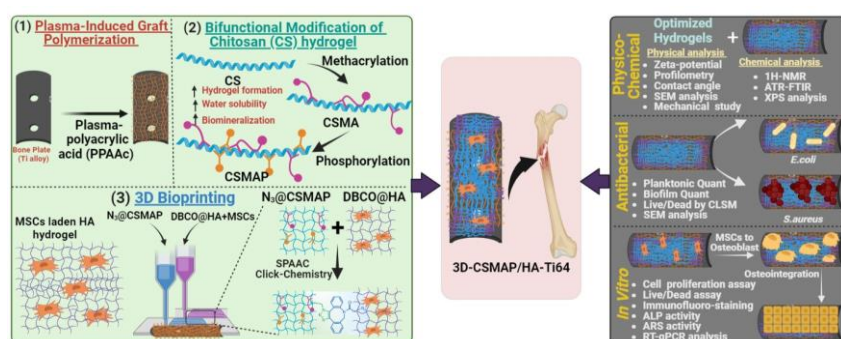
Title: Development of Concentration Gradient Microfluidic Needle Patch for Combinatorial Diabetic Therapy.

Funding Agency: DBT Phase I Grant.

Period: 2023-25.

Amount: INR 24,40,000.

Dr. Anjaneyulu Udduttulla



Title: Click Chemistry Induced Cell-Laden 3D Hydrogel Integrated Orthopaedic Implants to Combat Infections and Osteointegration Failure.

Funding agency: SERB-SRG

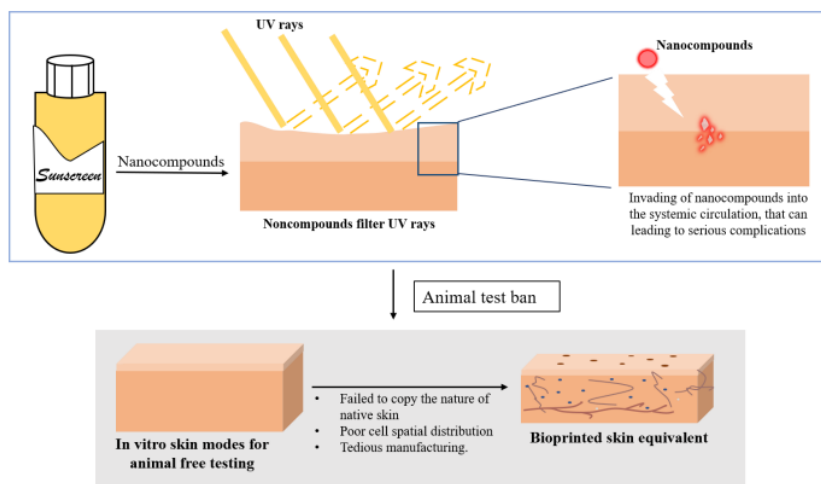
Period: 2023- 25

Amount: INR 30,23,372/-.



Funded Projects

Dr. Amit Kumar Jaiswal



Title: Assessment of permeation and toxicity of nanoparticles on polysaccharide-based 3D bio-printed bilayered skin substitute.

Funding Agency: DST-Indo Austria Joint Call.

Period: 2023-25.

Amount: INR 6,60,000/-..



New Additions

Faculty

Dr. Anjaneyulu Udduttulla (January – 2023)



Biomaterial scientist by training with 6 years of experience in bioengineering and biomaterials science by training from Newcastle University, UK, Zimmer Biomet, UK, and the Chinese Academy of Sciences, China. He is an Honorary Assistant Professor at the University of Hong Kong (QS rank: 26), HK. He received a PhD from VIT, Vellore, in 2017. He joined as an Assistant Professor (Sr) at CBCMT, VIT, in January 2023. His key research lines are (i) biofunctional materials for finding bone loss early on; (ii) anti-infective implant surface technologies; (iii) bioprinting integrated osteostimulative implants; (iv) new bioinks for 3D bioprinting; and (v) injectable hydrogels for treating osteoarthritis. He published articles in top-tier journals like Nature communication, ACS Applied Materials and Interfaces, Composites Part B, Applied Surface Sciences, and Journal of Orthopedic Translation.

New Additions



PhD Scholars



Name of the scholar: Mr. Manisha Sonthalia
Qualification degree: MSc – Biotechnology
University: Reva University, Bangalore
Joined VIT: January 2023
PhD thesis mentor: Dr. Amit Kumar Jaiswal

Name of the scholar: Mr. Yogesh D
Qualification degree: MSc – Advanced Biochemistry
University: University of Madras (Guindy campus), Chennai
Joined VIT: January 2023
PhD thesis mentor: Dr. Arunkumar Pitchaimani



Name of the scholar: Mr. Kalaiarasu L
Qualification degree: MSc – Chemistry
University: Bharathidasan University, Trichy
Joined VIT: January 2023
PhD thesis mentor: Dr. Loganathan Rangasamy

Name of the scholar: Mr. Unnikrishnan B
Qualification degree: MSc – Chemistry
University: University of Kerala, Kerala
Joined VIT: January 2023
PhD thesis mentor: Dr. Loganathan Rangasamy



Name of the scholar: Ms. Shreyasi Bhattacharya
Qualification degree: MSc. – Microbiology
University: Calcutta University, Kolkata
Joined VIT: August 2023
PhD thesis mentor: Dr. Raunak Kumar Das

Name of the scholar: Ms. Kruthi Ashok Kumar
Qualification degree: MSc. – M.Sc Human Genetics and
Molecular Biology
University: Bharathiar University, Coimbatore
Joined VIT: August 2023
PhD thesis mentor: Dr. Raunak Kumar Das





New Additions

PhD Scholars



Name of the scholar: Ms. Esther Shalini K
Qualification degree: M.Sc. – Analytical Chemistry
University: VIT, Vellore
Joined VIT: August 2023
PhD thesis mentor: Dr. Sushma Kumari

Name of the scholar: Mr. Sudharssan T
Qualification degree: M.Sc. – Analytical Chemistry
University: VIT, Vellore
Joined VIT: August 2023
PhD thesis mentor: Dr. U. Anjaneyulu



Name of the scholar: Ms. Chithra Anilkumar
Qualification degree: M.Sc. – Chemistry
University: University of Kerala
Joined VIT: August 2023
PhD thesis mentor: Dr. U. Anjaneyulu

Name of the scholar: Mr. Bala Agnishwaran K
Qualification degree: M. Sc. – Biotechnology
University: Vels Institute of Science, Technology &
Advanced Studies, Chennai.
Joined VIT: August 2023
PhD thesis mentor: Dr. U. Anjaneyulu



Name of the scholar: Mr. Nandakumar S
Qualification degree: MSc. – Nanobiotechnology
University: Amirta Vishwa Vidyapeetham,
Joined VIT: August 2023
PhD thesis mentor: Dr. U. Anjaneyulu

Name of the scholar: Ms. Divya R
Qualification degree: MSc – Physics
University: Bharathidasan University, Trichy
Joined VIT: August 2023
PhD thesis mentor: Dr. A. Joseph Nathanael



New Facilities Developed



Bio-Translational Lab (BTL)

We are proud to announce the establishment of our cutting-edge Bio-Translational Lab facility, dedicated to advancing the forefront of research in addressing bone diseases. Our mission is to pioneer innovative solutions that not only contribute to the scientific understanding of bone-related ailments but also lead to the development of reliable technologies. The culmination of our research efforts is geared towards translating these breakthrough technologies into commercial applications with the invaluable support of our industrial partners. The Bio-Translational Lab is an open space for collaborative exploration and innovation, where experts from diverse backgrounds can join forces to work on transformative tissue regenerating projects.



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Biopolymeric Scaffolds and 3D Bioprinting Lab

We are a highly interdisciplinary and collaborative lab working on biopolymeric scaffolds and 3D bioprinting to regenerate biological tissues for medical conditions that involve complete or partial tissue loss or dysfunctions. Biomaterials show supremacy in tissue repair and regeneration with comparatively high compatibility with the native extracellular matrix (ECM). This lab focuses on developing biomaterial-based biomimetic and drug-eluting scaffolds and bio-inks to fulfill the current clinical need for multifunctional scaffolds to repair large tissue defects in tissue engineering.

News



CBMCT Faculties visit to Research Facilities



The faculties from CBCMT visited **Bioscience Research Foundation (BRF)**, Kandamangalam. The faculties visited various vibrant research facilities. Many collaborative ideas were brainstormed, and future collaborative projects were discussed.

News



International Faculty Visit

Prof. Nicholas Jakubovics, Professor, School of Dental Sciences, Faculty of Medical Sciences, Newcastle University, United Kingdom visited CBCMT and delivered a talk in "Joint Meeting of Researchers & Clinicians" 15th February 2023 at VIT, Vellore.



"Quality in Dental Research" on 03/03/2023 at VIT by **Dr. Arvind Babu R S B.D.S., M.D.S.**, Professor, School of Dentistry, Faculty of Medical Sciences, The University of the West Indies, Mona, Jamaica.

"Porous materials for biomedical applications" on 28/09/2023 at VIT by **Dr. Tushar Kumeria**, Scientia Senior Lecturer, School of Materials Science and Engineering, The University of New South Wales (UNSW), Sydney, Australia.



"Stepping into new dimensions Electrospun Nanofiber for biotechnological uses" on 02/06/2023 at VIT by **Dr. Johnson V John**, Assistant Professor, Terasaki Institute for Biomedical Innovations, Los Angeles, California, USA.

"Biomimetic Collagen based functional scaffold musculoskeletal tissue engineering" on 07/07/2023 at VIT by **Dr. Vipull Kishore**, Associate Professor, Departmental of Chemical Engineering, Florida Institute of Technology, Florida, USA

"Tumor-associated Neutrophils and their 'NET' work" on 20/12/2023 at VIT by **Dr. Arvind Chandrasekaran**, Assistant Professor, Department of Chemical, Biological and Bio Engineering at the North Carolina A&T State University, Greensboro, USA.



New collaboration initiated

- Terasaki Institute of Biomedical Innovation, LA, California United States of America
- Dr. Indira Prasadam, Senior Lecturer, Faculty of Engineering, School of Mech., Medical & Process Engineering, Queensland University of Technology (QUT), Australia.
- Dr. Tushar Kumeria, Scientia Senior Lecturer, School of Materials Science and Engineering, The University of New South Wales (UNSW), Sydney, Australia.
- Fabrication of injectable putty system for osteomyelitis -Initiated with Dr. George Thomas and Dr. Thilak Samuel Jepeganam, Christian Medical College, Vellore
- Designing an adhesive polymeric patch for treatment of diabetic foot ulcers - Initiated with Dr. Sanjay Sharma, Foot Secure, Bangalore.
- Dr. Konrad Kleszczynski, Group Leader, University of Münster, Department of Dermatology, Von-Esmarch-Str. 58, 48149 Münster, Germany
- Prof. Karin Stana Kleinschek, Univ.-Prof. Dr.rer.nat., Graz University of Technology, Institute of Chemistry and Technology of Biobased Systems, GRAZ, Austria
- Dr. Amit Kumar, Scientific Officer 'G', Radiation Signaling & Cancer Biology Section, Radiation Biology & Health Sciences Division, Bhabha Atomic Research Centre, Mumbai-85
- Department of Zoology, Cooch Behar Panchanan Barma University and Pathology Department, Maharaja Jitendra Narayan Medical College & Hospital, Cooch Behar, West Bengal
- Dr. Ching-Feng Chieu, Assoc. Prof. Graduate Institute of Metabolism and Obesity Sciences,
- Taipei Medical University, International Internship Pilot Programme (IIPP).
- Philip S. Low, Ralph C. Corley Distinguished Professor of Chemistry, Presidential Scholar for Drug Discovery, Department of Chemistry, Purdue University, DST-OVDF, Fellowship.
- Dr. Charlène Gadais Lecturer / Assistant Professor, Rennes Institute of Chemical Sciences UMR CNRS 6226 University of Rennes - Faculty of Pharmacy, Rennes Cedex, France, Raman Charpak Fellowship (RCF).
- Established New collaboration with Dr. Thangaraj, Director, and Dr.P. Govindraj, Head, Laboratory of Human Molecular Genetics at Centre for DNA Fingerprinting and Diagnosis (CDFD), Hyderabad in the area of Mitochondrial transplantation for Alzheimer disease.
- Established New collaboration with Christian Medical College-Neuro oncologist Dr. Bayslish Vivek Joseph (Neurosurgeon), Dr. Rajesh B(Neurosurgeon), and Dr. Christhunesa S (Neurochemist) in the area of microfluidic needle technology for glioblastoma recurrent therapy.

Training Programs / conferences attended by CBCMT Faculty / Students

- ❖ "Brainstorming Workshop on Future Technologies in Healthcare and Biomedical Devices-2023" Jointly organized by Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST) Trivandrum and Technology Information, Forecasting, and Assessment Council (TIFAC) New Delhi 
- ❖ Training on handling and management of laboratory animals, TANUVAS Tirunelveli was attended by Anupama Devi V K.
- ❖ Dr. Joseph Nathanael, Dr. Sushma Kumari and Ms. Menaga G attended 21st National Conference and Technology Exhibition on Medical Devices (Plastic Disposables & Implants) Industry: Manufacturing, Quality & Regulatory-Challenges & Opportunities organized by Indian Medical Device Industry in Chennai on August 26-27, 2023.
- ❖ Dr. Arunkumar Palaniappan, Dr. Joseph Nathanael, Ms. Sreena, Ms. Akshaya and Ms. Menaga were attended a conference on Technologies and Therapeutics for Diabetic Foot Ulcer (PODOCON-2023) organized by Foot Secure, IISc Bangalore on 11th July 2023.
- ❖ Dr. Arunkumar Pitchaimani and Dr. Joseph Nathanael attended European Research Day (ERD 2023) in Bangalore on 27th September 2023
- ❖ Ms. Akshaya. S attended high-end workshop on "Advanced Testing and Quality Evaluation of Food Packaging Materials" (SERB-KARYASHALA) from 02nd January 2023 to 08th January 2023.
- ❖ Ms. Akshaya. S attended a Conference on Food and Agri-waste utilization: Strategies, Applications and safety aspects - NIFTEM-T on 10-11th October 2023.
- ❖ Mr. Yogesh from Precision nanomedicine and microfluidic lab, represented CBCMT Microfluidic work "Hydrogel coated Lab-on-a-chip model for screening the osteoblastic differentiation of Mesenchymal stem cells" in India's First Microfluidic Conference held in IIT Madras, from 29th – 3rd Sep 2023.
- ❖ Ms. Pearlin Aman Khan presented an Oral presentation under the Bajpai Saha award Lectures at BioTex 2023 IIT-Delhi. Mr. Rohin Shyam presented an oral presentation under the Pioneering Materials Technology at BioTex 2023 at IIT-Delhi.
- ❖ Mr. Ansheed Raheem and Ms. Shweta Shukla (MTech Student) presented their posters at BioTex 2023 at IIT-Delhi.
- ❖ Ms. Purnimajayasree, presented an Oral Presentation at the 3rd International Conference on Nanomaterials for Biology (ICNB 23) held at IIT-Gandinagar.
- ❖ Ms. Maya B, presented a Poster at the 3rd International Conference on Nanomaterials for Biology (ICNB 23) held at IIT-Gandinagar.

News



Invited lectures and talks by CBCMT Faculties

Prof. Geetha Manivasagam:

- ✚ Fulbright Training workshop, Fulbright Funding opportunity, LA, United States of America – 01st December 2022
- ✚ Additive Manufacturing of Metallic Alloys and Composites: Academic and Industrial Perspective, PDPM Indian Institute of Information and Technology Design and Manufacturing, Jabalpur, India – 11th to 13th April 2023
- ✚ Tribocorrosion-An overview, Indian Institute of Science, Bengaluru, India – 16th June 2023
- ✚ Design for Additive Manufacturing Course. VIT, Vellore, India – 24th July 2023
- ✚ Biomimetic Implants: The Ultimate Choice For Improved Service Life In Orthopedic Implants, International Conference on Biomaterials and Healthcare Technologies, IIT Delhi - 27th November to 1st December 2023.

Dr. Loganathan Rangasamy:

- ✚ Inauguration Lecture, on Small molecule Drug Conjugates (SMDC) and PROteolysis targeting Chimeras (PROTACs): an Emerging Therapeutic Modality", in the association Inauguration (cheminitio-2023), organized by the Karpagam Academy of Higher Education, Coimbatore, Oct 18, 2023.
- ✚ Delivered an invited lecture on "The emerging role of small molecules in targeted cancer therapy" at Government Arts College, Coimbatore. April 19, 2022.
- ✚ Delivered an invited lecture on Small Molecule Drug Conjugates: Guided Missiles Against Cancer at Dhanalakshmi Srinivasan University Samayapuram , Trichy, India. January 06, 2023.
- ✚ Delivered an invited lecture on the Recent Spate of Bioconjugate Medicines at KSR College of Arts and Science for Women Namakkal Tamil Nadu and Bharath University Chennai Tamil Nadu, Erode, India, March 16-17, 2023.

Dr. Arunkumar Palaniappan:

- ✚ Invited talk on a title "Nano-engineered 3D printed hydrogel patch as a potential combinational therapeutic platform against triple-negative breast cancer cells" at International Conference on Biomedical Materials and Technology (BioTex) IIT Delhi - 27th November to 1st December 2023,
- ✚ Invited talk on Engineered Cardiac Tissue – A Potential 3D tissue model for drug screening application and a tool for cardiac tissue engineering at Auxilium College, Vellore 08th December 2023.

Dr. A. Joseph Nathanael:

- ✚ Invited talk on "Innovations influenced by Nature for Real World Problem" in Jain Group of Institutions, Bangalore 12th July 2023.
- ✚ Invite talk in National Conference on Material Synthesis an Environmental Sustainability (NCMSES-2023) organized by PG and Research Department of Physics, Sacred Heart College (Autonomous), Tirupattur, Tamil Nadu 26th September 2023.

Events



C3 (Crazy. Curious. Creative) Club

Weekly Club Activity

C3 club of CBCMT organizes weekly seminars and motivational talks from international faculty, industry personnel's, eminent scientists, alumni and students to inculcate a research and innovation culture.



Outcomes:

- Exposure to basics and advanced Science & Engineering
- International Exposure
- Students gain scientific query
- Motivation and Soft skills

Events



VIT Quality Week – 23rd Feb till 3rd March 2023

International Expert Talks



As a part of quality week in VIT, CBCMT also organized few events from 28th Feb to 3rd March 2023. Dr. RS Aravind Babu, Professor, School of Dentistry, School of Medical Sciences, The University of West Indies, Mona Campus, Jamaica, delivered a lecture on ‘Application quality in dental and science research: Scope and collaboration’ on 3rd March 2023 from 3:00 to 4:00 PM in CDMM 213.

YouTube video making competition for Research Scholars on “Doing the right thing”

We organized a competition for research scholars on YouTube video making competition for Research Scholars on “Doing the right thing”.

1st Prize – “5S Rule” – Menaga S, Akshaya S, & Sreena R

2nd Prize – “Subtle art of doing research incorrectly” – Rohin Shyam, Purnimajayashree SR, Maya B, & KalaiPRIYA R.

3rd Prize – “The Michael-ian and Lucifer-ian Laboratory Practices” – Dhivyaa Anandan, Ceera M & Anupama Devi VK.

Cash prize was given to the winners for their creative ideas.





Events

Faculty Development Program on “Medical Devices: 3D printing and Bioprinting of Hard and Soft Materials ” 19th July 2023

“One day Faculty Development Program (FDP) on Medical Devices: 3D printing and Bioprinting of Hard and Soft Materials” was organized by CBCMT on 19th July 2023, in VIT Vellore. Dr. Naresh Kasoju Scientist-C and Deputy



Quality Manager, Sree Chitra Tirunal Institute for Medical Sciences & Technology (SCTIMST), Kerala, India and Dr. Prasanth K. G. Head of Additive Manufacturing Laboratory, Tallinn University of Technology, Tallinn, Estonia were delivered a talk in this FDP. Total of 61 Faculty members / Postdoctoral Fellows / Research Scholars from various schools in VIT attended this FDP.

Hands-on-Training

Organized SERB SSR-CRG hands-on training and workshop on HPLC and flash chromatography from 25th to 28th October 2023.

Venue: CDMM 305
No. of Attendees: 20
25th to 28th October 2023..



Foreign expert lecture

Guest Lecture on Small Extracellular Vesicles: Natural Nanoparticles in Therapeutics and Diagnostics by Dr. Ram Mohan Ram Kumar on 2nd August 2023

Presentation on Monolith X and Prometheus Panta- Overcoming Challenges in Protein Characterization and Biomolecular Interactions by Dr. Sindhura B R on 23rd August 2023

CBCMT Birthday Celebrations

Every month, in the last week C3 journal club meeting we celebrate birthdays of our members.

Achievements



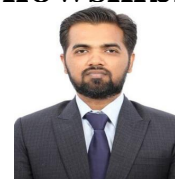
Successful Completion of Prestigious Indo-US Fellowship



Our director, **Prof. Geetha Manivasagam** received one of the most prestigious and highly-recognized fellowship, **Fulbright-Nehru Academic and Professional Excellence Fellowship** (award no. 2754/F-N APE/2022). She visited the biomedical innovation hub at LA, California - Terasaki Institute for Biomedical Innovation (TIBI) and worked there for a six-months. She was hosted by a well-known biomaterial and tissue engineering expert, Dr. Ali Khademhosseini, who is the CEO of TIBI. During her visit, they signed an MoU for future collaboration. Many Congratulations to our Director!

Our Faculties Received Prestigious Awards / Fellowships

Prof. Amit Kumar Jaiswal SERB International Research Experience (SIRE) Fellowship, 2023 - December 2023 to June 2024 - 6 months at Universidade de Aveiro, Portugal.



Dr. Anjaneyulu Udduttulla received Honorary Assistant Professor position in the Faculty of Dentistry at the University of Hong Kong, Hong Kong (QS world rank: 26)

Dr. Arunkumar Palaniappan, from CBCMT, has been honored with the prestigious MAHE "Young Scientist Award" 2023 by the Society for Biomaterials & Artificial Organs (India).

The award was presented to Dr. Palaniappan during the BioTEX-2023 conference, organized by the Society for Biomaterials & Artificial Organs (India) at the Indian Institute of Technology (IIT) Delhi from 27th November to 1st December 2023. His remarkable achievement is attributed to his outstanding paper presentation on the topic, "Nano-engineered 3D printed hydrogel patch as a potential combinational therapeutic platform against triple-negative breast cancer cells."

Congratulations to Dr. Arunkumar Palaniappan and his team! & best wishes to him for his continued success.





Achievements

Our Research Scholars Received Competitive Fellowships:

Our research scholars, Ms. **R. Sreena** received the prestigious fellowship, **Savitribai Jyotirao Phule Fellowship for Single Girl Child (SJSGC)** offered by University Grants Commission, New Delhi to continue her research for next five year. Congratulations to the scholar!



Also, wishes to her mentors, Dr. Joseph Nathanael for guiding the scholar to come up with a compelling proposal!

Four of our research scholars, received a fully funded “**International Internship Pilot Program (IIPP)**”, from National Scientific and Technology Council, Taiwan.

Name: Mr. Harashkumar,
University: Fu Jen Catholic University, Taipei, Taiwan
Period: October to December 2023.



Name: Mr. Janarthanan,
University: Taipei Medical University, Taipei, Taiwan.
Period: December 2023 to January 2024.



Name: Ms. Surya Priya
University: National Yang Ming Chiao Tung University, Taipei Taiwan
Period: December 2023, to February 2024.



Name: Mr. Selvaganapathy
University: National Cheng Kung University, Tainan Taiwan
Period: October 2023, to January 2024.



Unnikrishnan B (22PHD0475) was selected as one of the 5 Phase I contestants in the Scientific Challenge for Drug Discovery Projects (Winter 2023) organized by BioSolveIT, Sankt Augustin, Germany. He received free computational software (BioSolveIT licenses) for 12 months to conduct the desired research. (<https://www.biosolveit.de/scientific-challenge/>).



An interim report after the first three months and a final report at the end have to be submitted to BioSolveIT. The overall best achievement will be acknowledged with a research grant of €1000. Congratulations to Mr Unnikrishnan and his mentor Dr. Loganathan.

Achievements



- Ms. Anupama Devi VK, secured Rudolf Cimdin's Scholarship for attending the 33rd Annual Conference of the European Society for Biomaterials, which was held on September 04-08, 2023, at Davos, Switzerland
- Ms. Anupama Devi VK, secured DST SERB International Travel Scheme (ITS), for attending the 33rd Annual Conference of the European Society for Biomaterials, which was held on September 04-08, 2023, at Davos, Switzerland
- Ms. Anupama Devi VK got 2nd place for translational medicine Ideathon 2023, which was held at IISc Bangalore in 2023

CBCMT research scholars Ms. Dhanashree Murugan and Mr. Kalaiarasu L, as a team, won the first prize + Cash Award of Rs 25000 in the "Cancer Hackathon 2023 Grand Finale" for the topic "Peptide conjugated drug delivery for targeting breast cancer stem cells".



Two teams from CBCMT participated in the Cancer Hackathon conducted by Karpagam

■ கேன்சர் ஹேக்கத்தான் இறுதி போட்டியில் வெற்றி பெற்ற மாணவர்களுக்கு, கற்பகம் கல்வி குழும தலைவர் வசந்தகுமார் பரிசுகளை வழங்கி கவுரவித்தார்.

Academy of Higher Education, Startup TN, TICEL Biopark, and TIDCO. Out of 120 pitched ideas, 30+ were shortlisted for the Grand Finale.

Congratulations to the students and their Professor Dr Loganathan who have guided them to achieve this.

CBCMT faculty members Prof. Geetha Manivasagam, Prof. Amit Kumar Jaiswal and Prof. Loganathan received the "Outstanding Researcher Award" for the year 2022 from our honorable Chancellor during the Research Award Ceremony. Other faculty members Dr. Mohan Varma, Dr. Raunak Kumar Das, Dr. Joseph Nathanael, Dr. Arunkumar Palaniappan, Dr. Arunkumar Pitchaimani received faculty



research award from our honorable Chancellor and Vice Presidents for their contributions such as publications, research fundings and H-index contributions. Congratulations for their achievements!

Achievements



- Mr. Ansheed Rahim, PhD Scholar, received the 'Best Poster Award' at 'Asian Thermal Spray Conference and Expo 2023' held between 2-4 November 2023 at Indian Institute of Technology Madras, Chennai.
- Ms. Purnimajayasree, PhD Scholar, wins Best Oral Presentation award at the 3rd International Conference on Nanomaterials for Biology (ICNB 23) held at IIT-Gandinagar.

Congratulations On Earning Your PhD!



*CBCMT Congratulates
Dr. V Chaithanya Vinay
On Earning His Doctoral
Degree!*

We Are Proud OF You!

Faculty Service Awards!

Our centre faculties, Prof. Geetha Manivasagam, Prof. Amit Kumar Jaiswal, and Dr. Raunak Kumar Das, VIT service award for their continuing service in VIT for the past several years.





Alumni Testimonials

Mr. Vidul Goenka

Current Position: Research Assistant, bit.bio, Cambridge, United Kingdom

I graduated with a B.Tech in Biotechnology from VIT in June 2020. My final semester was dedicated to a curriculum mandated Capstone Project which I had pursued under the supervision of Dr. Amit Kumar Jaiswal's lab in the CBCMT department. The initial discussions for the project topic were open-ended and allowed me to raise questions and give inputs as a bachelor's student. This allowed me to already start thinking in a scientific approach before I even stepped in the lab.



Throughout my 6-month capstone project, I received ample opportunity to improve my technical skills in the lab in addition to my research skills. Dr. Jaiswal ensured a holistic development of his students during this period by arranging a biweekly journal club as well as extending invitation to us for presentations and lectures within the broader CBCMT group. Within Dr. Jaiswal's lab, I had access to all the equipment I needed, and I was further pleased with the support offered for collaboration within CBCMT for the use and training of niche equipment important for my project. I am grateful for all the opportunities CBCMT strives to provide for its researchers. As a student, I have taken modules under two faculties of CBCMT, Dr. Amit Kumar Jaiswal and Dr. Raunak Kumar Das focusing on Tissue Engineering and Neurobiotechnology respectively. Their expression of knowledge in their respective fields has been instrumental in shaping my career. I have been fortunate to be associated with this department and its distinguished faculty.

Ms. Scimran Da Costa

Current Position: Application Specialist for Extrusion based and DLP based Bioprinters at Altem Technologies, Bangalore, Karnataka, India

I joined VIT as a postgraduate student in Biomedical Genetics in the year 2021. I always had passion for Tissue Engineering and Regenerative medicine. During my time at VIT, I began exploring the laboratories and facilities available there that would eventually lead me to pursue a career in my field of interest. That's when I found Human Organ Manufacturing and Engineering Lab (HOME Lab) which was a part of Centre for Biomaterials, Cellular and Molecular Theranostics (CBCMT). I started off



by working on a project under Dr Arunkumar Palaniappan that involved the development of a bioink for preparation of a 3D bioprinted hydrogel patch for biomedical applications. This incredible opportunity allowed me to gain practical insights into the field of bioink development and bioprinting. The exposure to cutting-edge research methodologies was invaluable to my growth.

Further, I subsequently decided to pursue my master's thesis too at HOME Lab (CBCMT-VIT), as I realized that there was a lot more that I would be able to learn. For my master's thesis, I worked on a project titled '3D printed drug loaded Cellulose-based patch incorporated for wound healing application'. During that time, I got the opportunity to independently work with bioprinter and hydrogels. I got a chance to explore all the features of the bioprinter and understood the versatility of this system. I learnt a lot about formulating bioinks, perform biomaterials evaluation tests like swelling, degradation, rheology, etc. This experience was not only immensely rewarding, but also gave me a further opportunity to have a career in bioprinting at Altem Technologies.








Aside from that, working with HOME lab-CBCMT's research scholars has been both inspiring and educational, and I am grateful for the support provided throughout my research process. Their guidance has been instrumental in my development, and thanks to them, I was able to apply the knowledge and skills acquired from HOME Lab - CBCMT to my professional endeavours. Thank you HOME lab-CBCMT members for all the mentoring: both technical skills and research communication skills.

Editorial Team

Dr. Geetha Manivasagam
Director
CBCMT

Dr. A. Joseph Nathanael
Dr. Amit Kumar Jaiswal
Dr. Arunkumar Palaniappan
Dr. Raunak Kumar Das
Mr. Rohin Shyam

Connect with Us

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Cover Image: HaCaT cell line (adult Human immortalized keratinocyte). Stained using Papanicolaou Stain. Staining was done based on the manual provided by the kit. Imaged on Thermofisher EVOS M5000. The device is available in HOME Lab, CBCMT. Image Courtesy: Ms. Pavitra R, PhD Scholar, CBCMT






IBTN India's Student Chapter

WEBINAR SERIES 2023

IBTN - INDIA

Institute of Biomaterials, Tribocorrosion, Nano and Regenerative Medicine



Dr. Saurabh Sharma
General and Vascular Surgery, Stanford school of medicine, Stanford University

"Synthetic and Nature-derived Non-toxic Actively Targeted Nanomedicine Platform technology for Cancer treatments"

To join webinar [Click Here!](#)


Join us

Date: 25-05-2023
Time: 12 - 1 PM
Indian Standard Time (IST)


About us

IBTN-India is a research chapter to create a platform where research scholars and early career researchers convene to discuss research and innovations in medical implants, tissue engineering, and nanomedicine fields.

Registration






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WEBINAR SERIES 2023

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Institute of Biomaterials, Tribocorrosion, Nano and Regenerative Medicine



Dr. Ankit Gangrade
Postdoctoral Researcher, Terasaki Institute for Biomedical Innovation USA

"A walk through the Multifaceted Biomedical Applications of Hydrogels: My journey"

To join webinar [Click Here!](#)


Join us

Date: 27-06-2023
Time: 10 AM
Indian Standard Time (IST)


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WEBINAR SERIES 2023

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Institute of Biomaterials, Tribocorrosion, Nano and Regenerative Medicine



Dr. Rajarshi Pal
Co-Founder & Chief Scientist, Ecosystem Research, Centre for Cellular and Molecular Platforms (C-CAMP), Bengaluru

"Retinal Cell Replacement for Age-related Macular Degeneration: A Pluripotent Stem Cell-Based Approach"

To join webinar [Click Here!](#)

Join us

Date: 25-08-2023
Time: 3 PM
Indian Standard Time (IST)

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WEBINAR SERIES 2023

IBTN - INDIA

Institute of Biomaterials, Tribocorrosion, Nano and Regenerative Medicine



Dr. S.K. Varshney
Adviser/Scientist C, Department of Science and Technology, New Delhi

"Research: Challenges and Opportunities"

To join webinar [Click Here!](#)

Join us

Date: 28-10-2023
Time: 3 PM
Indian Standard Time (IST)

About us

IBTN-India is a research chapter to create a platform where research scholars and early career researchers convene to discuss research and innovations in medical implants, tissue engineering, and nanomedicine fields.

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