PhD Placement Brochure

Department of Biological Sciences and Bioengineering

Mehta Family Centre for Engineering in Medicine

Message from HoD

Prof. Amitabha Bandyopadhyay
Head of Department

KENT chair for entrepreneurship & innovation Professor-in-charge, Startup Incubation and Innovation Centre

The Department of Biological Sciences and Bioengineering, IIT Kanpur is delighted to invite you to this year's placement session. Since its inception, our department has been dedicated to training students and conducting high-quality research in various aspects of bioengineering, including biomaterials, tissue engineering, bioinformatics, and medical device development.

Our students at IIT Kanpur, especially those in the BSBE Department, undergo a rigorous interdisciplinary curriculum, including courses in statistics, basic sciences, computing, electronics, engineering, professional communication, and humanities. Our academic curriculum provide them with exceptional flexibility to prepare for diverse careers in academia, industry R&D, entrepreneurship, consulting, software development, business analysis, and investment.

Recent government investments in MedTech and Biotechnology, along with institutional development, highlight the sector's growth potential. The department is dedicated to preparing students with a strong engineering foundation and multidisciplinary education to excel in the industry and drive growth in this dynamic field.

About Us

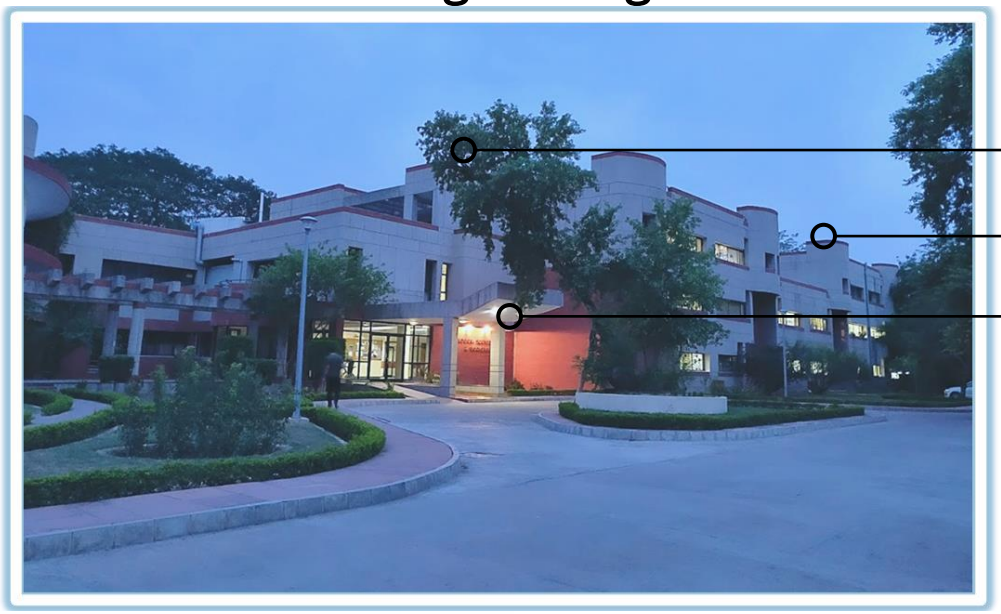
The Department of Biological Sciences and Bioengineering (BSBE) at IIT Kanpur, founded in 2001, is dedicated to advancing research and providing high-quality training in basic biology, biomedical sciences, and bioengineering. Through interdisciplinary approaches, BSBE tackles complex challenges at the intersection of science, engineering, and medicine, supported by a fully functional animal house facility to conduct essential research.

The newly established Centre for Engineering in Medicine aims to fast-track "engineering solutions to medical problems," leveraging IITK's engineering strengths and BSBE's focus on biomedical research. This center will drive expansion in faculty, students, and infrastructure, broaden academic offerings, and encourage collaboration across IITK.

Adding to IIT Kanpur's legacy of innovative societal impact, the Gangwal School of Medical Sciences and Technology will further this vision, fostering MedTech innovation and transforming medical research in India. Together, these initiatives position IITK as a leader in technological advancements in healthcare, addressing urgent needs through cutting-edge education and research.

Research areas

Department of Biological Sciences and Bioengineering



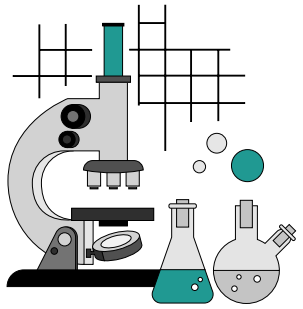
- Molecular, Cellular and Developmental biology
- Bioengineering
- Structural and computational biology

Mehta Family Centre of Engineering in Medicine

- Regenerative Medicine
- Molecular Medicine and Engineering
- Digital Medicine

Skills

Research



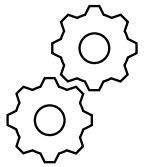
- Biopharmaceuticals
- Biomaterials
- Protein Biochemistry
- Developmental Biology
- Microscopy & Imaging
- Microbiology
- Neurobiology
- Biophysics
- Structural and Computational Biology
- Genetic engineering
- Tissue engineering
- Oncology

Computational

SnapGene

CHENOMX
NMR Mixture Analysis

Technical



- Super-resolution microscopy
- Single-molecule imaging
- Protein engineering
- Flow Cytometry
- Cryo-Electron Microscopy
- X-ray Crystallography
- Biosensor design
- High throughput screening
- Nuclear Magnetic Resonance
- AAV gene therapy
- Electrophysiology

Soft Skills

- Team Players
- Strong Temperament
- Effective Interpersonal communication

Curriculum

Core Courses

Cell and Molecular Biology

Biomaterials

Experimental Bioseparation

Structural Biology

Immunology and Microbiology

Neurobiology & Developmental Biology

Functional Genomics

Technical Courses

Principles of Biotechnology

Biopharmaceuticals

Bioinformatics and Computational Biology

Modern Instrumental Methods in Biology

Tissue Engineering

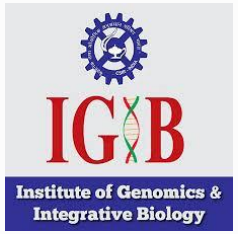
Biochemical Engineering

Computational Genomics

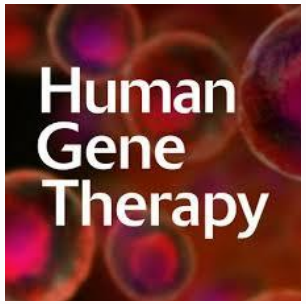
Collaborations

Industries

Academics



Publications



Alumni

Dr. Vikas Trivedi
Group Leader
EMBL, Barcelona

Dr. Sagar Bhogaraju
Group Leader
EMBL Grenoble

Dr. Era Jain
Assistant Professor
Syracuse University

Dr. Sajish Mathew
Assistant Professor
University of South Carolina

Dr. Sumit Pal Singh
Group Leader
IRIBHM, Belgium

Dr. Manish Jaiswal
Scientist
TIFR, Hyderabad

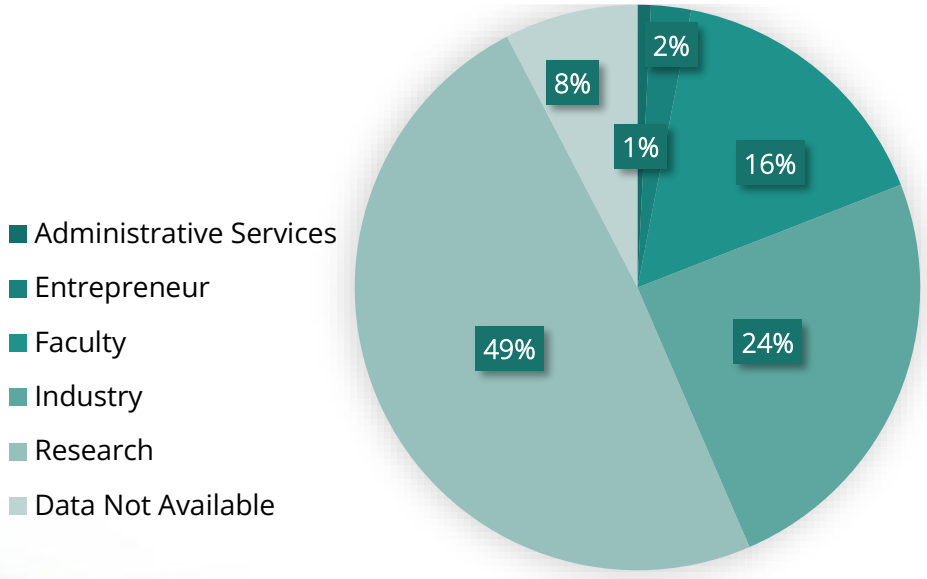
Dr. Mohit Jolly
Assistant Professor
IISc, Bangalore

Dr. Bhaskar Anand,
Principal Investigator
IIT Guwahati

Tejas kusurkar
Co-Founder
Offgrid Labs

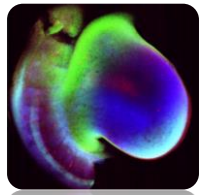
Brindan Tulachan
Co-Founder
Offgrid Labs

Rashie Jain
Co-Founder
Onco.com



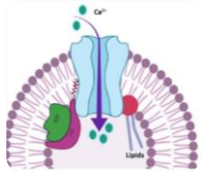
Lab Expertise

Dr. Amitabha Bandyopadhyay
Skeletal Biology Lab
We study the patterning and differentiation of developing limb skeleton. Using the principles of development we try to understand cartilage and bone homeostasis disorders.

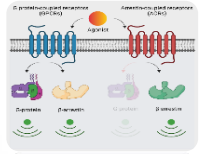


Dr. Anusmita Sahoo
Vaccine Development Lab
Our research focuses on developing vaccines against emerging viral pathogens, with detailed understanding of the immunological cross talks that help maintain vaccine stability and efficiency.

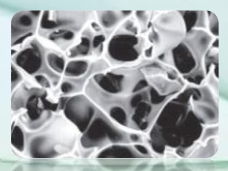
Dr. Appu Kumar Singh
Singh Lab
Our lab focuses on the structure and function of therapeutically important membrane proteins using cryogenic-electron microscopy and electrophysiology, then using this valuable structural information for drug design.



Dr. Arjun Ramakrishnan
Decision Lab
We investigate decision-making and related brain underpinnings to understand effects of stress and mental health conditions, and find biomarkers for their treatment and early diagnosis.

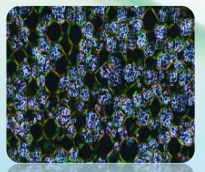


Dr. Arun Kumar Shukla
GPCR Lab
We focus on understanding the structure and function of GPCRs and improve the available therapeutics using cellular signaling, protein biochemistry, receptor pharmacology and structural biology methods.

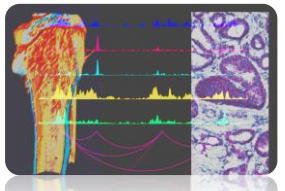


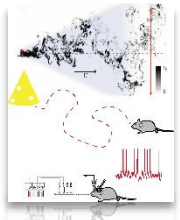
Dr. Ashok Kumar
AK Biolabs
We work on regenerating malfunctioned organs while rejuvenating the blunt crosstalk between injured tissues with advanced fabrication techniques like cryogelation, electro-writing, 3D printing etc.

Dr. Ashwani Kumar Thakur
Amyloid lab
We focus to understand the mechanisms of protein aggregation and amyloid formation while specifically focusing on polyglutamine aggregation, cataract formation, amyloid-inspired biomaterials, and plant seed amyloids.



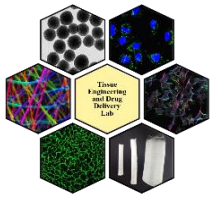
Dr. Bushra Ateeq
Molecular Oncology lab
Our group is primarily interested in exploring the genetic and epigenetic changes that drive cancer and its progression, and deciphering the molecular underpinnings involved in drug resistance.





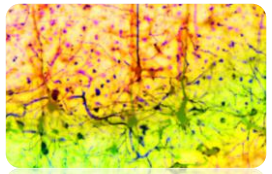
Dr. Debanjan Dasgupta
Neural Circuit Dynamics Lab
Our research lab focuses on understanding how the external sensory world imprints a cognitive map on our brain and how do they get disrupted in diseases like Alzheimer's Disease.

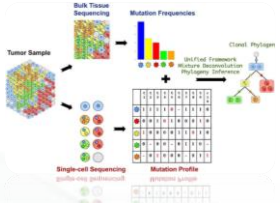
Dr. Dhirendra S. Katti
Tissue Engineering and Drug Delivery Lab
Our research focuses on the development of biomaterial-based technologies in the areas of drug delivery, tissue engineering, regenerative medicine and nanobiotechnology.



Dr. Dibyendu K. Das
Single Molecule Biophysics and Virology Lab
We employ single molecule imaging to understand life cycles of viruses within the host and study their escape from host immune system to establish infection.

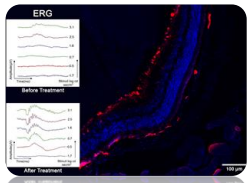
Dr. S. Ganesh
Human Molecular Genetics Lab
We work to decipher cytogenetic changes in neurodegenerative disorders, stress responses and aging. Our aim is to explore novel therapeutic strategies in context of neurodegeneration.





Dr. Hamim Zafar
Cosmic Lab
We develop probabilistic graphical models and machine learning algorithms for exploring cellular heterogeneity, cellular dynamics and cell-cell interaction in cancer and development using single-cell sequencing.

Dr. Jayandharan G. Rao
Molecular Genetics and Therapeutics
We focus on the development and pre-clinical validation of gene therapy for various monogenic disorders using the bioengineered virus (AAV) to help treat human patients.



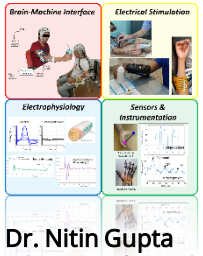
Lab Expertise

Dr. Jonaki Sen
Developmental Neurobiology Lab

We study the gene regulatory networks involved in morphogenesis, patterning, and neuronal differentiation of the forebrain using chick and mouse embryos.

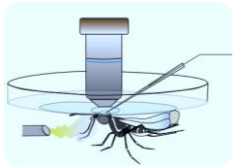
Dr. Nikunj A Bhagat
Neural Engineering & Motor Rehabilitation Laboratory

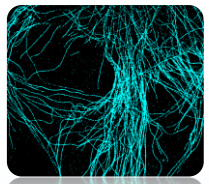
Our lab focusses on developing neuro-technologies that can integrate with our body's nervous system in order to repair, restore, or replace any damaged neural pathways, caused by a neurological disease or injury. Our specific research areas are brain-machine interfaces, functional electrical stimulation, prosthetics, electrophysiology, sensors, and instrumentation.



Dr. Nitin Gupta
Laboratory of Neural System

Using the fly and mosquito, we try to decipher the neural circuitry that governs odors-specific behaviour using electrophysiology, behaviour approaches, and genetic manipulations.





Dr. Nitin Mohan
BioResolution Lab

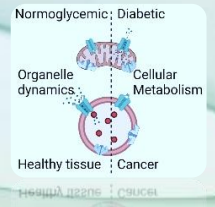
We develop advanced optical microscopy methods to understand microtubule regulation of lysosomal transport and positioning, its implications in autophagy, lysosomal storage disorders, and neurodegenerative disorders.

Dr. Pradip Sinha
Fly Lab

We query the genetically high tractable Drosophila to uncover the cellular and molecular basis of human diseases like cancer, innate immunity, and diabetes.

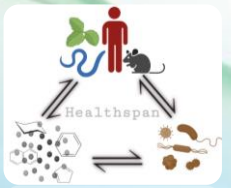
Dr. Rakesh Majhi
Tissue Restoration Lab

Research interests in our lab span different fields of ion channels, immunology, microscopy, biomaterials, reproduction, organelle dynamics,
and cancer immunotherapy.



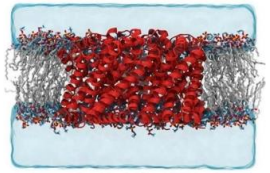
Dr. Robert Sonowal
The Microbiota and Healthspan Lab

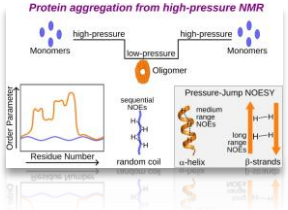
Our lab studies the commensalism of microbes with plants and animals, particularly on the involved metabolites and explore their therapeutic potential using animal models.



Dr. R. Sankararamakrishnan
Bioinformatics and Biomolecular Simulation Lab

We carry out computer simulations to understand the transport and selectivity of membrane protein channels and transporters. We use structural bioinformatics approach to identify novel non-covalent interactions in biomolecules and characterize them using quantum chemical calculations.



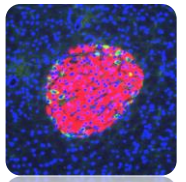


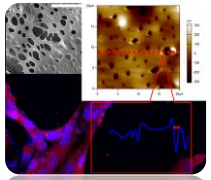
Dr. Sai Chaitanya Chiliveri
NMR Lab

Our lab exploits biophysical techniques and NMR spectroscopy to investigate the mechanistic insights into the dengue viral assembly process and the structural flexibility of membrane-associated proteins.

Dr. Sai Prasad Pydi
Molecular Metabolism and cell Signaling Lab

We explore the physiological role of GPCR signaling pathways in obesity and type-2-diabetes to develop novel therapeutic targets using chemogenetic technology.



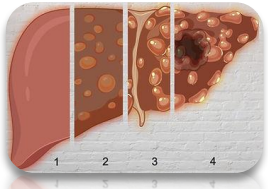


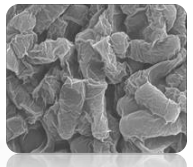
Dr. Santosh K. Misra
BioMeDHs Lab

We develop diagnostic tools for the early detection of diseases like cancer, and therapeutics for recovery using nanotechnology, personalized medicine and 3D printing approaches.

Dr. Shanu Jain
Liver Metabolism Lab

We investigate the role of GPCRs in the pathogenesis of liver metabolic disorders, including metabolic dysfunction-associated steatohepatitis and hepatic fibrosis. Our research aims to develop innovative GPCR-targeted therapeutic strategies for the effective treatment of liver diseases.



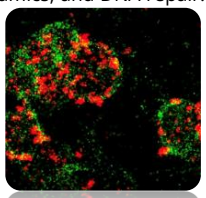


Dr. Saravanan Matheshwaran
Chromatin Remodelling Lab

Using microorganisms as a model, we investigate chromatin remodeling complex to understand their survival strategies with respect to stress response, chromatin dynamics, and DNA repair.

Dr. Suresh Kumar
Autophagy Lab

Our lab is investigating the membrane dynamics during biogenesis of autophagosomes. We also study the machinery required for each step of mammalian autophagy pathway.



Contact Us

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