

## DEPARTMENT OF BIOSCIENCES AND BIOENGINEERING

### List of Research Topics for Spring Semester 2018-2019

Sr. No.	Name of Guide/ Co-guide	Title/s of research project	Special academic prerequisites
<b>BT</b>			
BT-1	Swati Patankar	Trafficking to the apicoplast in <i>Toxoplasma gondii</i> : does random localization confer virulence?	None
BT-2	Swati Patankar	Biological effects of lack of auto-inhibition displayed by the Apicomplexan nuclear transporter, Importin $\alpha$	None
BT-3	Shamik Sen	Role of glycocalyx in cancer progression & cancer invasion	Bio background
BT-4	Shamik Sen Co-guide- Ashutosh Kumar	Role of human islet amyloid polypeptide protein (hIAPP) in non-pancreatic cells	Bio background
BT-5	Ambarish Kunwar	Computational study of interactions of various potential anti-cancer drugs with cancer drug-resistant tubulin isotypes	Prior knowledge of computer simulation
BT-6	Ambarish Kunwar	Computational Modelling of Cargo Switching at Microtubule Intersections	Prior knowledge of computer simulation
BT-7	Ambarish Kunwar	Understanding isotype specific interaction of motor proteins with microtubules	Prior knowledge of computer simulation
BT-8	Anirban Banerjee	Role of host intracellular defense mechanisms in clearance of <i>Streptococcus pneumoniae</i>	None
BT-9	Anirban Banerjee	Commensal to virulence: exploring mechanism for switch in lifestyle of <i>Streptococcus pneumoniae</i>	None
BT-10	P.S. Phale	Engineering 1-Naphthol Hydroxylase to improve the substrate specificity and catalytic efficiency	M Sc or BTech in any branch of biology
BT-11	P.S. Phale	Preferential utilization of aromatics over glucose in <i>P. putida</i> CSV86: studies on carbon catabolite repression leading to novel properties	M Sc or BTech in any branch of biology
BT -12	P.V. Balaji	Functional annotation of glycosyl hydrolases (computational project)	Computer programming
BT-13	Sanjeeva Srivastava, Co-guide – Dr. Aliasgar V Moiyadi, Tata Memorial Centre	Studying metabolic and molecular alterations in meningioma patients to understand tumor aggressiveness	Life Sciences/ Biochemistry/ Molecular Biology background. Experience in clinical work and proteomics techniques would be an asset.

BT-14	Sanjeeva Srivastava, Co-guide – Dr. Aliasgar V Moiyadi, Tata Memorial Centre	Targeted proteomic analysis of brain tumors	Life Sciences/ Biochemistry/ Molecular Biology background. Experience in clinical work and proteomics techniques would be an asset.
BT-15	Ashutosh Kumar	Deciphering the molecular and pathological basis of aggregation of hIAPP for rational drug design against Type 2 Diabetes mellitus (T2DM)	Should have Physics and Mathematics at B. Sc. Level. Preferably FA category student
BT-16	Ashutosh Kumar	Structural insights into specialized Nucleosome formation	Should have Physics and Mathematics at B. Sc. Level. Preferably FA category student
BT-17	Samir Maji	Prion-like transmission of p53 amyloid in cancer progression	None
BT-18	Samir Maji	Establishing the structure-toxicity relationship of alpha-synuclein oligomers: Therapeutic approach for Parkinson's disease.	None
BT-19	Samir Maji	Designing amyloid based artificial enzymes	None
BT-20	Prasenjit Bhaumik	Structure based improvement of cellulases for biofuel production	None
BT-21	Ranjith P.	Information theory of the histone code and 3D chromatin organization	M Sc Physics, Physical Chemistry, Computer Science. B.Tech/BE in core engineering subjects
<b>BME</b>			
BME-1	Shamik Sen	Tissue Adhesives for Normal & Diabetic Wound Healing	Bio background
BME-2	Ambarish Kunwar	Comparative study of appliances used for orthodontic tooth movement using finite element modeling (FEM)	Prior knowledge of computer simulation
BME-3	Rohit Srivastava	Design and development of Point of care test for Thyroid stimulating hormone, triiodothyronine(T3) and thyroxine(T4) hormone in whole blood	MS (Pharma) with minimum 1 year experience at IIT Bombay TAP category
BME-4	Rinti Banerjee	Nanotechnology platforms for transdermal drug delivery	FA category

Prof. Rinti Banerjee  
Head