

ARITRA MONDAL

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RESEARCH INTEREST

My goal is to develop a fundamental understanding of the structure, dynamics, interactions, and function of biological systems, using interdisciplinary principles of physics, chemistry, mathematics and computer modeling. Currently, my research focus is on the evolution of the tension profile of the cell membrane, during mechanical processes like deadhesion. I have used multiple high-resolution imaging and microscopy techniques and I am always interested to further explore the field. I'm also interested in the computational modelling of the dynamics of similar sub-cellular processes.

Keywords: Biophysics, Cell Biology, Computational Biology, Microscopy

EDUCATION

Indian Institute of Science Education and Research, Kolkata <i>Bachelor of Science-Master of Science (BS-MS) - CGPA: 7.6/10</i> - Major in Biological Sciences - Minor in Physical Sciences	2017 - Present
SJDAV Public School, Chaibasa <i>Higher Secondary (AISSCE)</i>	2017
SJDAV Public School, Chaibasa <i>Secondary (AISSE)</i>	2015

RECENT EXPERIENCES

- **Regulation of Cell Membrane tension by Endocytic Recycling during Deadhesion** *IISER Kolkata, 2021-22 MS Research Project - under supervision of Dr. Bidisha Sinha*
 - I'm trying to investigate how endocytosis and exocytosis can be responsible for the regulation of the membrane tension of a cell, during mechanical processes like deadhesion.
 - I'm also building a computational model of the endocytic recycling system.
- **Predicting Differentiation Status in C2C12 Cells** *IISER Kolkata, Summer 2021 under supervision of Dr. Bidisha Sinha*
 - Machine learning was used to look at early images of C2C12 skeletal cells (2 hours from application of differential media) and predict the fate of cell at 72 hours (differentiated/ undifferentiated).
- **Simulating Endocytosis using Rate Equations** *IISER Kolkata, Summer, 2020 under supervision of Dr. Bidisha Sinha*
 - The main aim was to understand how the cell membrane tension changes during processes like deadhesion.
 - Simulations to predict membrane tension and surface area ratios were performed.
- **Induced Morphological Changes in *Bacillus subtilis*** *IISER Kolkata, November 2019 Course Project - Cell Biology and Imaging Laboratory*
 - *Bacillus subtilis* was grown in nutrient-deprived stressed conditions under this project.
 - Cells were found to change their shape from spherical to elongated. Cell aggregates and filament formation were also observed under more stressed conditions.
- **Flocking Behaviour in Living and Non-Living Systems** *IISER Kolkata, Summer, 2019 under supervision of Dr. Rumi De*
 - Short project based on 'Vicsek model', which describes collective motion and swarming of active matter.
 - Simulations were performed under different stressed conditions.

OTHER EXPERIENCES

CSIR-UGC-NET (2021) Qualified

March 2022

JRF-NET Rank: 212

Teaching Assistant

IISER Kolkata, Autumn 2021

Cell Biology and Imaging Laboratory Course (3rd year B.Sc.)

SKILLS

Laboratory techniques:	Cell Culture, Immunostaining, Gel Electrophoresis, PCR
Imaging:	Epifluorescence Microscope, Confocal Microscope
Programming:	C, Python, MATLAB, LaTeX
Software & Tools:	ImageJ/FIJI, Origin
Others:	Statistical analysis, Machine Learning

OTHER ACHIEVEMENTS

- Notable Participant in IITB-ISRO-AICTE Mapathon (2020)
- Convener of Science Club of IISER Kolkata (2019-20)
- Winner of Hackathon, IISER Kolkata (2019)
- Event Organizer for gaming event of annual fest of IISER Kolkata (2018,2019)
- IISER Aptitude Test- Ranked in the Top-100 (2017)