Jyotirmoy Roy

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Research Interests

- **Metabolism; Immunotherapies for Autoimmune Diseases; Bioinformatics**

Education

2022–Present **University of Michigan**
Pre-doctoral student in Biomedical Engineering Department; Shea Lab; GPA: **4/4**

2018–2022 **Indian Institute of Technology (IIT), Bombay**
Senior Undergraduate, B.Tech in Chemical Engineering with Minor in Biology; GPA: **8.84/10**

Academic Honors

2023 **Dwight F.Benton Fellowship**, University of Michigan

2020 **Undergraduate Research Award** for research contribution in biosciences at IIT Bombay

2020 **Best Teaching Assistant Award** for freshmen Biology course, IIT Bombay

Publications/Pre-print/Book chapter

Jan 2023 J.Marvar, et al "Porous PDMS-Based Microsystem (ExoSponge) for Rapid Cost-Effective Tumor Extracellular Vesicle Isolation and Mass Spectrometry-Based Metabolic Biomarker Screening", *Advanced Materials Technologies, 2201937*

Nov 2022 J.Roy*, et al, "Modeling of COVID-19 Transmission Dynamics on US Population: Inter-transfer Infection in Age Groups, Mutant Variant and Vaccination Strategies", *Scientific Reports, 12(20098)*

Jan 2022 S Aggarwal, et al. "Metabolomics: Role in pathobiology and therapeutics of COVID-19", *Multi-Pronged Omics Technologies to Understand COVID-19, 75-99*

Aug 2021 S.Aggarwal*, S.Parihari*, A.Banerjee*, J.Roy*, *et al.*, "Metabolome and exposome profiling of the biospecimens from COVID-19 patients in India", *Journal of Microbiology, Epidemiology and Immunobiology, 98(38-ϕ3), 397*

Feb 2021 K. Suvarna, *et al.*, "Proteomics and machine learning approaches reveal a set of prognostic markers for COVID-19 severity with drug re-purposing potential", *Frontiers in Physiology, 12, 432*

Jan 2021 R. Bankar, *et al.*, "Proteomic Investigation Reveals Dominant Alterations of Neutrophil Degranulation and mRNA Translation Pathways in COVID-19 Patients", *iScience, 24(3), 102135*

*: Joint First Author

Research Experiences

Apr'23–Present **Metabolic Biomarkers for Type 1 Diabetes | University of Michigan**
Supervisor: Prof. Lonnie Shea, Biomedical Engineering Department

- Developing a metabolic flux model to unveil dysregulated pathways in Type 1 Diabetes onset and leveraging gene and metabolite to construct a predictive elastic net machine-learning model

Jul'21–Feb'22 **Machine Learning Based Proteomics Analysis of Meningioma Grades | IIT Bombay**
Supervisor: Prof. Sanjeeva Srivastava, Department of Biosciences and Bioengineering

- Developed a **Random Forest** model in **Python**, which classified meningioma grades with **92**% accuracy and identified the top **10** potential protein biomarkers based on mean decrease accuracy

Apr'21–Sep'21 **Modeling of Transmission of COVID-19 Mutants | Purdue University**
Supervisor: Prof. Doraiswami Ramkrishna, Department of Chemical Engineering

- Designed a **SIRDV-virulence** model in **MATLAB** to examine inter-transfer infection of mutants of COVID-19 among age groups in the US population

Dec'19–Apr'20 **Two Dimensional Ant Trail Model | IIT Bombay**
Supervisor: Prof. Ambarish Kunwar, Department of Biosciences and Bioengineering

- Extended the one dimensional ant-trail model to two dimensional lattice by designing a Monte Carlo based computational model in **FORTRAN**

Teaching and Mentoring Experience

Jan'23 – Apr'23 **Graduate Student Instructor**, Systems Biology of Human Disease(BIOMEDE 418)
Instructor: Prof. Deepak Nagrath, Department of Biomedical Engineering, University of Michigan

Oct'22 – Dec'22 **BME GAAP Mentor**, BME Graduate Application Assistance Program
Department of Biomedical Engineering, University of Michigan