DHRUV SATANUR

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Education

University of Maryland, College Park **Aug 2024 - May 2028**

B.S. in Bioengineering, Physics (Concentration: Biophysics)

Relevant Coursework: Organic Chemistry 1 & 2, Calculus I & II & III, Physics I & II, Biostatistics, Cellular Biology. Thermodynamics, Statics, Mammalian Physiology, Linear Algebra & Differential Equations

Clubs: iGEM, Accessible Prosthetics Initiative, Red Cross Club

Technical Skills

Languages & Certifications: Java, Python, Javascript, HTML/CSS, MATLAB, R, EMT-B, CAD, SolidWorks

Research Skills: Data Analysis, Mammalian Cell Culture, Cell Transfection, RT-PCR, qPCR, Western Blot, ELISA Assays, Bioreactors

Work Experience

University of Maryland Institute For Health Computing **Sep 2026 - Present**

Undergraduate Researcher, Dr. Pratyush Tiwary's Research Group: *Artificial Chemical Intelligence Lab*

- Leading a Phage Modeling Project using AlphaFold2Rave to design a gripper protein to help fight antibiotic-resistant bacteria

Fischell Department Of Bioengineering **Feb 2026 - Present**

Undergraduate Researcher, Dr. Alex Xu's Research Group: *Spatial Biology Laboratory*

- Navigated PhysiCell Studio environment and XML configuration files; ran sample projects and analyzed SVG, MAT, and CSV outputs to characterize cell position and type storage
- Designed computational domains with spatially defined multi-cell-type arrangements (cancer, cancer-immune, immune-only clusters) using XML configuration settings
- Developed Python analysis scripts to compute cell-type densities and distance-based metrics from simulation output files; configured Zaratan HPC account and practiced SLURM job submission workflows
- Implemented trackable cell agents within simulations and scripted quantification of Euclidean distance to defined regions over time, regional residence times, and local cell density experienced by tagged cells
- Executed parameter sweeps of 100-1000 parallel simulations on Zaratan HPC, varying factors such as cell motility speed and adhesion strength; aggregated multi-run metrics (distance profiles, residence times, density distributions) to compute summary statistics for model calibration

Fischell Department Of Bioengineering **August 2025 - May 2026**

Undergraduate Research Assistant, Dr. Steven Jay's Research Group: *Biotherapeutic Development and Delivery Laboratory*

- Designed and executed experiments to fuse Bacterial and Mammalian Extracellular Vesicles into a novel hybrid delivery vehicle, optimizing traversal through intestinal fluid environments
- Evaluated drug loading capacity and release kinetics of engineered nanocarriers across two parallel research projects focused on payload delivery and biocompatibility
- Scaled production of engineered vesicles via cell transfection and bioreactor maintenance under sterile mammalian cell culture conditions
- Performed Western Blot, ELISA, RT-PCR, and qPCR to assess protein and gene expression profiles of vesicle constructs
- Maintained routine passaging and sterile culture of mammalian cell lines to support continuous experimental workflows

Beth Israel Deaconess Medical Center **May 2025 - January 2026**

Department of Cardiac Anesthesia, Clinical Research Intern, Perioperative Anesthesia Research

- Managed data entry and patient health record verification across multiple active clinical studies using EPIC and REDCap
- Supported data collection for the SCOPE and EMERGE trials, gaining exposure to ICU and OR research environments
- Observed surgical procedures alongside attending anesthesiologists and collaborated with research fellows on perioperative data workflows
- Developed familiarity with clinical trial infrastructure and regulatory data management standards in a Level I academic medical center

Projects & Publications

Agent-Based Modeling of Spatial Niche Dynamics in Heterogeneous Tumor Microenvironments **February 2026 - Present**

Accomplishments

Debater with Outstanding Distinction **June 2024**