Isha Arora

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EDUCATION

B.S. Biomedical Engineering **2020-2024**
Cornell University, Ithaca, NY, USA
Concentration: Molecular, Cellular, and Systems Engineering (MCSE)
Minor: Computer Science
GPA: 3.846/4.0
Honors Thesis Title: Development of a Therapeutic Cancer Vaccine for 4T1 Breast Cancer Model in Mice
Thesis Advisor: Dr. Shaoyi Jiang

SCHOLARSHIPS & AWARDS

Engineering Learning Initiatives Grant **Summers 2021 & 2023**
Cornell University
- Wrote proposals for and received $9000 in funding to support research in the Lammerding and Jiang Labs

Michael J. Miller Scholarship **2020**
Association for the Advancement of Medical Instrumentation Foundation
- Received $3000 award for academic excellence and a commitment to healthcare technology

PUBLICATIONS

- **Isha Arora**, Arkadij Kummer, Hao Zhou, Mihaela Gadjeva, Eric Ma, Gwo-Yu Chuang, Edison Ong. mtx-COBRA: Subcellular localization prediction for bacterial proteins. bioRxiv. 2023.

CONFERENCES & PRESENTATIONS

- **ISCB RSGDREAM 2022 Poster Presentation & CUPP Poster Symposium** **Nov 2022**
  Joy Linyue Fan, **Isha Arora**, Alexander Preau, Nicolas Beltran-Velez, Elham Azizi. ECHIDNA – Mapping Genotype to Phenotype through Joint Probabilistic Modeling of Single-Cell Gene Expression and Chromosomal Copy Number Variation.
- **BMES 2023 Poster Presentation** **Oct 2023**
  Ronit Kumar*, **Isha Arora***, Amy Laflin, Estefani Quinones, Shaoyi Jiang. Novel Therapeutic Vaccine for the Treatment of Pancreatic Cancer.

RESEARCH & PROFESSIONAL EXPERIENCE

Berger Lab, Massachusetts Institute of Technology **Jan 2023 – Present**
*Undergraduate Researcher supervised by **Dr. Bonnie Berger, Dr. Rohit Singh***
- Developed and trained a transformer on codon and amino acid alphabets to study differences between synonymous and non-synonymous mutations from an evolutionary viewpoint

Jiang Lab, Cornell University **Sep 2021 – Present**
*Undergraduate Researcher supervised by **Dr. Shaoyi Jiang***
- Collaborated on two projects – testing of a compound as an inducer of trained immunity (alone / in conjunction with anti-PD1 immunotherapy) and development of generalized neoantigen-based vaccines for cancer
- Identified neoantigens for testing in B6F10, Pan02, and 4T1 cancer models
- Created mRNA for neoantigens from plasmids and helped inject mRNA-LNP constructs in mice
- Wrote ELISPOT protocol for lab and implemented it to test the immunogenicity of the identified neoantigens

Azizi Lab, Columbia University **Jun 2022 – Jan 2023**
*Columbia IICD Summer Research Program Intern supervised by **Dr. Elham Azizi***
- Built a novel probabilistic graphical machine learning model that incorporates multi-modal data to study the effect of the copy number variation on the response of melanoma cancer to anti-PD1 immunotherapy
- Used scRNA-seq data to deconvolve whole genome sequencing data into tumor clones
- Coded the model in Stan, fitted the model and ran posterior predictive checks in Python
- Used gene set enrichment analysis to study the dynamics between phenotypic and genotypic changes over time

Lammerding Lab, Cornell University **Jan 2021 – Aug 2021**
*Undergraduate Researcher supervised by **Dr. Jan Lammerding***
- Investigated the role of Nuclear Actin in DNA Damage Signaling during Confined Migration
- Developed PDMS microfluidic devices to mimic confined migration of cells in body
- Conducted immunofluorescence to detect localization of DNA damage markers and nuclear actin structures for two conditions and confirmed the temporal effect of DNA Damage Marker on cells using Western Blots
- Automated image and statistical analyses by creating macros in ImageJ and Excel

Moderna Therapeutics, Boston, United States **Jan 2023 – Jun 2023**
Co-op in Antigen Design & Selection Team (Bioinformatics Sub-team, Infectious Diseases)
- Developed an improved computational pipeline for SCL prediction resulting in a first-author publication
- Designed antigens for various pathogens using bioinformatics techniques including sequence conservation analysis, T-cell immunogenicity assessment, and structural modeling

TEACHING EXPERIENCE

Biomedical Engineering Department, Cornell University **Jan 2022 – May 2022**
Teaching Assistant
- Physiology of Human Health & Disease (Spring 2022)

Computer Science Department, Cornell University **Jan 2021 – Dec 2021**
Teaching Assistant
- Intro to Computing in Python (Summer 2021)
- Object-Oriented Programming and Data Structures (Spring 2021, Fall 2021)

LEADERSHIP, OUTREACH & EXTRACURRICULARS

Girls Who Code **Sept 2023 – Present**
Volunteer
- Taught introductory computer science concepts to high school students in weekly mentorship sessions and guided them through the development of text-based games

Cornell Hunger Relief **Nov 2020 – May 2021; Oct 2023 – Present**
Projects and Events Co-Chair; Secretary
- Helped organize and arrange various educational sessions to spread awareness about food insecurity in Ithaca amongst students and the greater community
- Assisted various food pantries with re-stocking and distributing food, despite the COVID-19 pandemic

Cornell Biomedical Device **Nov 2020 – Present**
Product Development Subteam Member
- Actively contributed to the biomedical device ideation, prototyping, circuit design, and app development for two projects – Exoguard and MyeMonitor

Cornell Anjali **Nov 2020 – Present**
Co-President (2023 – 2024), Co-Captain (2021 – 2022)
- Choreographed and taught various dances for on-campus performances and a 2-hour showcase
- Organized the logistical aspects of team performances & competitions and applied for funding

TECHNICAL SKILLS

Dry Lab
Programming Languages: Java, Python, MATLAB, ImageJ, R, OCaml, Stan; *Cloud Computing:* AWS, Azure; *Machine Learning:* PyTorch, Common Machine Learning Models; *Database Management:* MongoDB; *CAD*

Wet Lab
Experiments: Flow Cytometry, Western Blots, ELISA, ELISPOT, PCR, Immunofluorescence Microscopy, Live Cell Microscopy, Cell Culture, Bone Marrow Isolations, mRNA Synthesis; *Protocol Development*