Jai Mehta

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Education

University of Tennessee *Aug. 2023 – May 2027*
BS in Honors Computer Science, Chemistry **GPA: 4.00/4.00**
Minors in Pre-Health Professions, Molecular Biophysics

Wilson Central High School *May 2023*
Salutatorian, High School Diploma **GPA: 4.55/4.00**

Coursework

Computer Science Courses: Data Structures, Honors Algorithms, Computer Organization, Discrete Structures, Honors Probability and Statistics, Linear Algebra, Honors Calculus I & II

Medical Courses: Cellular and Molecular Biology, General Chemistry (with Lab), Organic Chemistry I & II (with Labs), Biochemistry, Honors Physics I & II

Experience

Researcher and Software Developer *Osaka, Japan*
Systems Immunology Lab, Osaka University *Dec. 2024 - Present*

- Building a Clonotype to Paratope converter using IMGT and MiXCR inputs that takes a V gene name, J gene name, and CDR3b sequence, and provides the complete amino acid sequence.
- Working on changing the amino acid sequence numbering to improve a multiple sequence alignment algorithm.

Teaching Assistant *Knoxville, TN*
Introductory Computer Science in C++, COSC 102 *Aug. 2024 – Present*

- Hosted weekly office hours to assist students with labs
- Assisted in topics related to learning Linux, basic data structures, dynamic memory, recursion, file I/O, searching algorithms, and binary logic.

Research Member *Knoxville, TN*
Emrich Lab *Aug. 2024 – Present*

- Utilizing scRNA-seq data to further understand cell state plasticity.

Research Intern *Oak Ridge, TN*
Oak Ridge National Lab, Center for Molecular Biophysics *Nov. 2023 - Present*

- Tested an in-house Machine Learning model against other models to evaluate Area Under the Receiver Operating Characteristic Curve (AUC-ROC) scores regarding prediction of T Cell Receptor to epitope binding specificity.
- Currently using AlphaFold-2 to predict MHC to peptide binding affinity.

Research Intern *Memphis, TN*
Yu Lab, St. Jude Children's Research Hospital *July 2024 - Aug. 2024*

- Evaluated a multi-informational clustering algorithm using scATAC-seq data with scRNA-seq labels to observe misclassification levels between cell phenotypes. Utilized Euclidean and Cosine distance estimation methods.
- Tested "Memory-like" and "Effector-like" cell states defined by a Gaussian Mixture Model using Joint Embedding, Differential Expression, and Gene Set Enrichment Analysis on clinical CAR T data.
- Combined clinical CAR T data, ran through Gaussian Mixture Model, and tested to observe similarities between individual clinical datasets and combined data.

Presentations and Talks

Defining Effector and Memory-like Cell State In in-vivo CAR T Cells from Multi-center Clinical Trials

- St. Jude Intern Presentation Day, Memphis, TN, Aug. 2024.
- UTK Undergraduate Research and Fellowships Discovery Day, Knoxville, TN, Sep. 2024.
- SASE National Conference, Computational Sciences Division, Boston, MA, Oct. 2024.

Panelist for *Student Panel for Undergraduate Research, Knoxville, TN, Nov. 2024.*

Selected Awards

Tau Beta Pi Honors	2024
Cook Grand Challenge Engineering Honors	2023
Chancellor's University Honors	2023
National Merit Scholar	2023
Distinguished Tennessean Scholar	2023
Ned McWherter's Scholar	2023
John Tummins Memorial Scholarship	2023
National Youth Science Camp Attendee	2023
Eagle Scout	2022

Technologies

Programming Languages: C++, Assembly, R, Java, R, Python, Bash

Skills: SciKit-Learn, ScanPy, Seurat, MacOS, Windows, Linux, Raspberry Pi, Arduino, Vim, Jupyter Notebook, GitHub, LaTeX, Single Cell Analysis, Machine Learning, High Performance Computing, Google Colab, AlphaFold