AKSHAYA THOUTAM

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EDUCATION 2020-2023

B.S Neuroscience, GEORGIA INSTITUTE OF TECHNOLOGY

- Minor in Health and Medical Sciences
- Relevant Coursework: Linear Algebra, Integral Calculus, Biostatics, Machine Learning in Bioscience, Cancer Biology and Technology, Tumor Microenvironment and Immuno-Oncology (MIT), Advanced Computational Biology: Genomes Networks Evolution (MIT), Statistical Inference for brain and cognitive sciences (MIT)

PUBLICATIONS

- Alan DenAdel, Madeline Hughes, **Akshaya Thoutam**, Ava P. Amini, and Lorin Crawford. Evaluating the role of pre-training dataset size and diversity on single-cell foundation model performance. (2024). In submission.
- Ajay Nadig, **Akshaya Thoutam**, Madeline Hughes, Srivatsan Raghavan, Peter Winter, Ava P. Amini, and Lorin Crawford. Consequences of training data composition for deep generative models in single cell biology (2024). In submission.
- "A single cell and spatial atlas of ER+ breast cancer response to pembrolizumab and radiation therapy". Nature. In submission.
- Greg Gibson, Dermot McGovern, **Akshaya Thoutam**, the NIDDK IBD Genetics Consortium, Judy Cho and John Rioux. Eleven Grand Challenges for Inflammatory Bowel Disease Genetics and Genomics. (2024). Inflammatory Bowel Disease
- Nasrin Hooshmand, **Akshaya Thoutam**, Max Anikovskiy, Hagar Labouta & Mostafa El-Sayed (2021). Localized Surface Plasmon Resonance as a Tool to Study Protein Corona Formation on Nanoparticles. Journal of Physical Chemistry C, 125(45), 24765–24776
- **Akshaya Thoutam**, Narasiah & Kolliputi (2021). Epigenetics of pulmonary diseases. In T. Tollefsbol (Ed.), Medical Epigenetics (2nd ed., pp. 45-67). Publisher. ISBN: 9780128239285
- **Akshaya Thoutam**, Mason Breitzig, Richard Lockey & Narasiah Kolliputi (2020). Coronavirus: a shift in focus away from IFN response and towards other inflammatory targets. Journal of cell communication and signaling, 1–2.

POSTERS

- **Akshaya Thoutam**, Erin Connolly, Greg Gibson (2022, April). A Pan-cancer Single-cell Transcriptional Atlas of Tumor-infiltrating Plasma Cells. Atlanta Workshop for Single Cell Omics 2022.
- **Akshaya Thoutam** & Greg Gibson (2022, October). A Pan-cancer single-cell transcriptional atlas of tumor-infiltrating B cells. National Symposium for Undergraduate Research
- Hira Anis, **Akshaya Thoutam**, Makeda Hailu, Vishal Dhere, Greg Gibson, Erin Connolly (2023, April) Single-cell Pan-cancer atlas reveals diversity and plasticity of tumor-infiltrating plasma cells. Atlanta Workshop for Single Cell Omics 2023
- **Akshaya Thoutam**, William Watson, Mohan William, Regina Nwosu (April 2023). 5HT2c against lorcaserin on spontaneous nerve root 3 activity in crayfish model. Georgia Tech Undergraduate Neuroscience Symposium

TALKS

- **Akshaya Thoutam** & Greg Gibson (2023, April). Pan-cancer atlas of tumor-infiltrating B cells. Georgia Institute of Technology Undergraduate Research Symposium

RESEARCH EXPERIENCE

Biomedical Machine Learning | **MICROSOFT RESEARCH** (Feb 2024 – Present)
Predoctoral Research Assistant

- Manipulating single cell foundation models to increase data depth and biology in capturing cell-state level biology
- Creating an end-to-end pipeline for alignment and analysis of single-cell RNA seq data

Levin Lab (Genomics) | **BROAD INSTITUTE OF HARVARD/MIT** (May 2023 – September 2023)
Computational Associate Intern

- Integrated long-read MAS-seq data, Visium spatial transcriptomics data, and single-nucleus RNA-seq to study spatially organized RNA isoform diversity in a pilot Parkinson's study
- Analyzed single-nucleus RNA-seq data of a SCN2A knock-out mice cortex from the SCHEMA Schizophrenia initiative.

Knott Lab (Genomics + ML) | **CEDARS SINAI** (May 2022 – October 2022)
Computational Associate Intern

- Analyzed temporal and spatial differences of cell types with scRNA-seq and ATAC-seq data from patients of an ER+ Breast Cancer clinical trial to characterize the tumor microenvironment in three different time periods of the clinical trial to elucidate the molecular mechanism that drive ER+ breast cancer

Gibson Lab | **GEORGIA TECH** (May 2021 – December 2023)
Computational Research Assistant

- Curated 133,488 B cells characterized from 246 tumor samples across 9 human cancer types to identify distinct molecular characteristics in the tumor microenvironment across cancer types - creation of pan-cancer atlas of B cells.
- Compared the Immune transcriptional spectrum across healthy colon, IBD, Crohn's Disease, and colon cancer progression.

Laser Dynamics Lab | **GEORGIA TECH** (May 2021 – May 2022)
Research Assistant

- Computationally modeled and synthesized gold and silver plasmonic nanoparticles of different morphologies for their applications in bio-sensing and photothermal therapy in cancer treatment

Kolliputi Lab (Immunology) | **UNIVERSITY OF SOUTH FLORIDA** (May 2020 – March 2021)
Research Writer

- Compared respiratory viruses MERS-CoV, SARS-CoV-1, human parainfluenza virus 3 (HPIV3), respiratory syncytial virus (RSV), and Influenza A Virus (IAV) to SARS-CoV-2 to uncover monocyte cytokine production as a driving feature of COVID-19 infection.
- Invited to write the chapter on 'The Epigenetics of Pulmonary Disease' for the textbook Medical Epigenetics, 2E (Elsevier)

AWARDS/HONORS

College of Sciences Deans Scholar | Georgia Institute of Technology — Awarded every semester
Early Research Award | Georgia Institute of Technology — August 2021
Robert Gunn Student Award Finalist | American Physiology Society — April 2023