AKSHAYA THOUTAM

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EDUCATION

HARVARD MEDICAL SCHOOL — Cambridge, Ma **2025-Present**
M.S Clinical Research

- Relevant Coursework: CI 700: Ethics and the IRB, CI 701: Clinical Data Science Design and Analytics I, CRES 701: Organized Basic Evidence-Based Medicine, CI 702A: Clinical Trials (Part 1), CRES 703: Developing Therapies for Patients, CRES 705: Systematic Review and Meta-Analyses, CRES 709: Interpreting Medical Literature (Part 1)

GEORGIA INSTITUTE OF TECHNOLOGY — Atlanta, Ga **2020-2023**
B.S Neuroscience

- Minor in Health and Medical Sciences
- Relevant Coursework: Linear Algebra, Integral Calculus, Biostatistics, 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), Artificial Intelligence in Medicine II (Harvard)

PUBLICATIONS

1. Zeinab Navidi, **Akshaya Thoutam,** Madeline Hughes, Srivatsan Raghavan, Peter Winter, Lorin Crawford, and Ava P. Amini. Adaptive Resampling For Improved Cellular Representation Learning in Imbalanced Single-cell Samples. (2025). *In submission – Nature Communications*.

2. 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). *Peer Review – Nature Methods*.

3. 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 (2025). *Peer Review – Genome Biology*.

4. 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*

5. Nasrin Hooshmand, **Akshaya Thoutam**, Max Anikovskiy, Hagar Labouta C 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

6. **Akshaya Thoutam**, Narasiah C Kolliputi (2021). Epigenetics of pulmonary diseases. In T. Tollefsbol (Ed.), *Medical Epigenetics* (2nd ed., pp. 45-67). Publisher. ISBN: 9780128239285

7. **Akshaya Thoutam**, Mason Breitzig, Richard Lockey C 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

RESEARCH EXPERIENCE

Project Ex Vivo | **BROAD INSTITUTE OF HARVARD/MIT** (July 2025 – Present)
Computational Associate II

- Using multimodal machine learning with scRNA-seq and spatial transcriptomics data to define and engineer cell states in cancer

Biomedical Machine Learning – Project Ex Vivo | **MICROSOFT RESEARCH** (Feb 2024 – July 2025)
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 investigate spatially organized RNA isoform diversity in a pilot study on Parkinson's disease.
- 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 to elucidate the molecular mechanisms 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, HPIV3, RSV, 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)

POSTERS

1. **Akshaya Thoutam**, Madeline Hughes (2025, April). Evaluating the role of pre-training dataset size, diversity, and composition on single-cell foundation model performance. RECOMB 2025 Research in Computational Molecular Biology.

2. **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

3. 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

4. **Akshaya Thoutam** C Greg Gibson (2022, October). A Pan-cancer Single-cell Transcriptional Atlas of Tumor-infiltrating B cells. National Symposium for Undergraduate Research

5. **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.

6. **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.

TALK

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

AWARDS/HONORS

BroadHacks 2025 Broadie's Choice Award Winners – Bronze | Broad Institute — June 2025
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

LEADERSHIP

Down to Dance (Founder/President) | Georgia Institute of Technology — August 2020 – May 2023 **Urban**
Health and Wellness committee leader | GT AMSA — September 2020 – May 2021
Fundraising committee leader | GT AMSA — September 2020 – May 2021

SHADOWING

Pediatric Pathology | Boston Children's Hospital | **60 hours**
Pediatric Heme Oncology | Boston Children's Hospital | **8 hours**
Neurosurgery | Atlanta Veteran Affairs Medical center | **80 hours**
Pediatrician | All Pediatrics Tampa | **100 hours**
Sarcoma Oncology | Moffitt Cancer Center | **40 hours** **Thoracic surgery** | Moffitt Cancer Center | **40 hours**

VOLUNTEERING

Emergency Department | Massachusetts General Hospital | **74 hours** August 2024 - Present
Arts in medicine Program | Emory Winship Cancer Center | **150 hours** August 2020 – May 2021
Care package | Advent Health Florida | **100 hours** March 2020 – December 2020
Recycling initiative | Cedars Sinai Hospital | **200 hours** May 2022 – August 2022