Tawaun A. Lucas

📍 South San Francisco, CA (willing to relocate)

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Professional Summary

An accomplished computational biologist with deep expertise in single-cell, spatial, and multi-omic analysis with the application of artificial intelligence and machine learning (AI/ML) to address pertinent biological questions in a range of disease indications. Proven record in biomarker development and the application of computational techniques to facilitate assay development. Proficient in the advanced use of cloud environments to analyze high-dimensional data. Trusted collaborator, skilled in cross-functional teamwork, with the ability to effectively present scientific content to diverse audiences.

Education

Stanford University School of Medicine   Sept 2014 – May 2021
Ph.D. in Neurosciences

- **Thesis advisor:** Marion Buckwalter
- **Relevant Coursework** Molecular and Cellular Neurobiology, Molecular and Cellular Immunology, Algorithms for Computational Biology, Computational Neuroscience

California State University, Northridge   August 2009 – May 2014
B.A in Psychology (Honors)

- Student-Athlete (Track and Field)
- **Relevant Coursework** Human Genetics, Psychobiology, Advanced Statistics

Work Experience

Postdoctoral Fellow   South San Francisco, CA
Genentech, Inc.   April 2021 – Present

- Created a large-scale single-cell transcriptomic atlas of human and mouse astrocytes across neurodegenerative diseases to inform foundational models in biomarker discovery.
- Led the development of analysis pipelines for spatial transcriptomics datasets (e.g., 10x Visium, 10x Xenium) and implemented machine learning algorithms to integrate gene expression and spatial location, generating insights about subclasses of glia and fibroblasts in neurodegenerative and inflammatory diseases.
- Generated experimental frameworks unifying multi-omics sequencing with CRISPR and ATAC (Perturb-seq, CITE-seq, 10x Epi Multiome) analysis, generating novel targets in inflammatory diseases.
- Seamlessly interfaced between computational and wet-lab scientists, reciprocally to allow for a lab-in-loop integration, easing the ability of our team to drive experimentation and analysis promptly.
- Collaborated and guided 3 junior researchers, 1 research associate, and 2 interns as well as specialists across neuroscience and immunology to address pertinent biological and clinical questions of interest.

Graduate Researcher   Stanford, CA
Buckwalter Lab- Neurology (Stanford)   Aug. 2014 – Feb. 2021

- Investigated peripheral glia in the spleen and their role in neuroimmune communication to address pertinent questions about immunity after head injury.
- Designed and deployed RNA-seq analysis frameworks and workflows using Snakemake and contributed to developing intricate transcriptomic studies, delivering insights into neuroimmune connections within the spleen and gut.
- Developed and maintained "Shiny" R apps for real-time data visualization, enhancing accessibility and utility for academic research labs

Summer Researcher   Stanford, CA
McClure Lab- (Stanford)   June 2013 – Aug. 2013

- Investigating the regulatory role of GABA on human action selection and decision making.
- Generated tasks to assess aspects of decision-making using MATLAB
- Conducted and analyzed large-scale fMRI scans

Undergraduate Researcher　　　　　　　　　　　　　　　　　　　Northridge, CA
Tonyan Lab - (Northridge)　　　　　　　　　　　　　　　　　October 2012 – May 2014

- ○ Investigating the effects of chaotic environments on child development and decision making.

Publications

SpatialAgent: An Autonomous AI Agent for Spatial Biology　　　　　March 2025

Wang, H, He,Y, Coelho, P, Bucci, M..., **Lucas, T A**..., Rozenblatt-Rosen, O, Leskovec, J,Regev, A

Submitted. Preprint: doi:10.1101/2025.04.03.646459v1 ↗

Integrated Cross-Disease Atlas of Human and Mouse Astrocytes Reveals　Feb. 2025
Heterogeneity and Conservation of Astrocyte Subtypes in Disease

Lucas, T A, Novikova, G, Rao, S, Wang, Y, Laufer, B., Pandey, S, Webb, M, Jorstad, N, Friedman, B, Hanson, J, Kaminker, J

In Revision-Nature Neuroscience Preprint: doi:10.1101/2025.02.12.637903 ↗

Translatome analysis reveals microglia and astrocytes to be distinct reg-　Aug 2023
ulators of inflammation in the hyperacute and acute phases after stroke

Hernandez, V, Lechtenberg, K J, Perterson, T, Zhu, L, **Lucas, T A** ... Bukwalter, M

Glia. *doi:10.1002/glia.24377* ↗

An RNA-sequencing transcriptome of the rodent Schwann cell response　April 2022
to peripheral nerve injury

Brosius-Lutz, A,**Lucas, T A**, Carson, G, Caneda, C, Barres, B, Bukwalter, M, Sloan, S

Journal of Neuroinflammation. *doi:10.1186/s12974-022-02462-6* ↗

Spleen glia are a transcriptionally unique glial subtype interposed be-　March 2021
tween immune cells and sympathetic axons

Lucas, T A,Zhu, L, Bukwalter, M

Glia. *doi:10.1002/glia.23993* ↗

Obesity drives delayed infarct expansion, inflammation, and distinct gene　June 2020
networks in a mouse stroke model

Perterson, T, Lechtenberg, K J, **Lucas, T A**, ... Bukwalter, M

Translational Stroke Research. *doi:10.1007/s12975-020-00826-9* ↗

Technical Skills

Languages: R, Linux/Bash, Python, Matlab
Computational Analysis: scRNA-seq, scATAC-seq, CITE-seq, Perturb/CRISPR/CROP-seq, 10x Multiome, 10x Visium & Xenium, MERFISH, Cell Atlases, Tidyverse, Numpy, Matplotlib, Pandas, Version control (git)
Computational Technologies: High-Performance/Cloud Computing (HPC/AWS), Machine Learning, Shiny
Machine Learning Frameworks: PyTorch, Scikit-learn, TensorFlow

Teaching & Service

Reviewer for Scholarly Journals:

- ○ Nature Neuroscience
- ○ Journal of Clinical Investigation
- ○ Glia

Program Manager/Teacher　　　　　　　　　　　　　　　　　　　Stanford, CA
Apogee Neuroscience Camp　　　　　　　　　　　　　　　　　Apr. 2018 – June 2020

Apogee Summer Camp is a three-week camp that educates senior high school students on several neuroscience topics. As program manager, I recruited students and teachers and managed the program's logistics, which included 50 students. As an instructor, I designed and implemented lesson plans focused on cognition and behavior. On average, this involved a commitment of 15 hours a week.

Brain Day Teacher — Stanford, CA
Stanford Neurosciences Program — Feb. 2015 – April 2021

As a Neuroscience Educator, I traveled to middle and high schools in the Palo Alto and East Palo Alto areas to teach one-hour interactive classes on the brain and its functions. Working collaboratively in groups of three, we designed engaging curricula and led dynamic activities. This program aimed to spark students' curiosity about the brain and neuroscience, fostering a more profound interest in the subject.

Senior Program Leader — Stanford, CA
Stanford ADVANCE Summer Institute — Mar. 2018 – Aug 2018

The ADVANCE summer institute is a 10-week bridge program for incoming Ph.D. students at the Stanford School of Medicine. As a Senior Program Leader, I was one of a two-person team that coordinated the program and organized the students. I taught weekly personal development seminars and recruited students into the program. On average, this was a 15-hour-a-week commitment

Founder — Stanford, CA
Diversity Center of Representation and Empowerment — Oct. 2017

The DCORE space is a physical space at the Stanford School of Medicine that engages underrepresented populations and provides a safe space for the community to gather to host events, study, or invite guest speakers to campus for seminars. As a founding member, I negotiated with the administration to secure this space. Press release: *https://stan.md/2ImI4fx* ↗

Senior Program Leader — Stanford, CA
Stanford Summer Research Program — Mar. 2016 - Aug. 2017

The SSRP is a nine-week intensive research experience for undergraduates from diverse backgrounds and skill levels nationwide. In addition to the research they conduct in labs, the program emphasizes professional development and preparation for grad school applications. As program lead, I was responsible for admissions, reading, and assessing fit for program and lab placement. I was also responsible for hiring Program Assistants to mentor undergraduates. On average, this was a 25-hour-a-week commitment.

Graduate Mentor — Stanford, CA
Earnest Houston Johnson Scholars — Dec. 2014 - Dec. 2015

This unique mentoring opportunity allowed me to mentor eight first-year Stanford University students majoring in biomedical science. We met weekly to discuss issues during their quarter, including applying to internships, building academic and professional resumes, and time management and priority setting. On average, this was a five-hour-a-week commitment.

Tutor — Northridge, CA
Academic Services for Student Athletes-CSUN — Jan. 2010 - May 2014

Provided one-on-one and group tutoring sessions in statistics and biology for undergraduate and graduate students, developing personalized lesson plans to address individual needs. Assisted students with complex topics like probability, hypothesis testing, cell biology, and genetics, improving their academic performance and confidence through tailored teaching techniques and continuous feedback.

Awards

Stanford School of Medicine Commencement Speaker	June 2020
Diversifying Academia and Recruiting Excellence (DARE) Fellowship	Aug. 2018 - Aug. 2020
National Science Foundation-Graduate Research Fellowship (GRFP)	Apr. 2015 - Apr. 2018
Stanford Biosciences - Excellence in Diversity and Societal Citizenship	May 2015
Stanford Office of Graduate Education ADVANCE Fellow	July 2014
NIH Minority Access to Research Careers (MARC) Fellowship	May 2012 - May 2014
CSU Northridge Undergraduate University/Community Service Award	May 2014
SRCD - Frances Degen Horowitz Millennium Scholar	April 2013