Tawaun A. Lucas

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Summary

I am a dynamic computational biologist with a Ph.D. in neuroscience from Stanford University and extensive postdoctoral experience at Genentech. Demonstrated expertise in spatial transcriptomics, neuroimmunology, neurodegeneration, and machine learning, with a proven track record in multi-omics analysis and biomarker development. Adept at cross-functional collaboration and leveraging advanced computational methodologies to drive innovative research and development in Precision Medicine.

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 Molecular Biology

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

Experience

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

- Conducted meta-analysis to investigate disease-associated subtypes of astrocytes using single-cell and spatial transcriptional data.
- Generated spatial transcriptomics data to complement single-cell omics analysis.
- Investigated cellular diversity of tumor microenvironments through gene expression and chromatin accessibility changes in lung
- Conducted analysis for single-cell Perturb-seq (CROP-seq) screen in mouse BMDMs
- Combined multi-omics analysis, molecular biology techniques, machine learning algorithms, and project management skills to advance various research programs

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

- Investigated peripheral glia in the spleen and their role in neuroimmune communication.
- Defined anatomy and morphology of spleen glia using immunohistochemistry.
- Generated and analyzed transcriptomic data of spleen glia and other glial types.
- Established and implemented a replicable RNA-seq analysis pipeline for the lab.
- Developed a web-based Shiny app to explore and visualize datasets produced in the lab.

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 fMRI scans on participants
- Recruited community members to participate in studies

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

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

Publications

Comprehensive Cross-Species Astrocyte Atlas Reveals Disease-Associated Clusters in Neurodegenerative Diseases Dec 2024

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

Submitted-Nature Neuroscience

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

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 to peripheral nerve injury April 2022

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 between immune cells and sympathetic axons March 2021

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

Glia. *doi:10.1002/glia.23993*

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

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, Python, Matlab

Technologies: High-Performance/Cloud Computing, Machine Learning, CRISPR analysis, Shiny
Laboratory Techniques: Immunohistochemistry, In-situ hybridization, Cell culture, Molecular biology, Microscopy, NGS
Machine Learning Frameworks: PyTorch, Scikit-learn

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 was responsible for recruiting students and teachers to the camp and managing the logistics of the program, which included 50 students. As an instructor, I designed and implemented lesson plans focused on cognition and behavior. On average, this was a commitment of 15 hours a week.

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

As a Neuroscience Educator, I had the opportunity to travel to middle and high schools around the Palo Alto and East Palo Alto areas to teach 1-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 played an integral role in negotiations 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 9-week intensive research experience for undergraduates from across the country who come from diverse backgrounds and skill levels. 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. In addition, I was responsible for hiring Program Assistants to mentor undergraduates. On average, this was a 25-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.

Selected 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*
Biosciences Award for Excellence in Diversity and Societal Citizenship *May 2015*
NIH Minority Access to Research Careers (MARC) Fellowship *May 2012 - May 2014*