

Jacob Elrod

jelrod14@vols.utk.edu

Education

University Of Tennessee (2021-Expected graduation date: May 2026)

Ph.D. Candidate - Genome Science and Technology- Neuroscience

PI: Dr. Keerthi Krishnan

Lawrence University (2017-2021)

Magna Cum Laude, Bachelor of Arts in Biology, Minor in Data Science (ACS Certified)

Research and Professional Experience

PhD Candidate, Jan 2022-Present

Krishnan Lab, University of Tennessee, Knoxville

- Established machine learning based pipelines for quantitative image analysis of molecular and cellular data for studies in rare neurological disorders.
- Completed data cleaning, wrangling and in-depth statistical analysis using Python and R in order to produce publication level figures.
- Analyzed murine behavioral video and audio data using deep learning software and predictive modeling.
- Ran and completed in vivo behavioral studies, including post-behavioral tissue collection, sectioning, IHC, and microscopy.
- Independently organized and led the establishment of primary neuronal culture techniques in the lab to study molecular dynamics of proteins involved in neurological disorders.
- Assisted in conducting literature search and review paper for MECP2, a protein involved in Autism spectrum disorders. Currently in works to be submitted for review.

Thesis Project: "Microbial Analysis of Raw vs Pasteurized Kombucha" Dec 2020 – June 2021

Appleton, WI, Lawrence University

- Independently ran research project examining microbial discrepancies between unpasteurized and pasteurized fermented beverages
- Collaborated with Hubbard Center for Genome Studies to complete sequencing and analysis of genomic data using NGS and metabarcoding
- Provided a novel analysis of a pertinent issue in the food & beverage industry, with future research potential to build upon this project.

Data Science Intern June 2019 - Aug 2019

Nashville, TN, HCA Healthcare

- Analyzed statistics on POC predictive data model for operating room efficiency
- Joined OR statistical modeling team and assisted in taking a POC to the enterprise level, including presentation to HCA executives to present model efficacy
- Organized and assisted in company-wide community service projects

Teaching Experience

University of Tennessee- Knoxville:

- BCMB415: Foundations of Neurobiology Aug 2023-May 2024
- BIOL101 & 102: Introduction to Biology Aug 2021-May 2023

Lawrence University:

- BIO250: Genetics March 2021-June 2021

Presentations

Speaker:

- “Quantitative Image Analysis using Cellpose, a deep learning network” Neuronet Seminar Series, University of Tennessee Knoxville, Jan 2025
- “Effect of Ultrasonic Vocalizations on Social Communication Behavior” UTK Psychology Department Brown Bag Seminar, Knoxville, TN Feb 2024
- “Kombucha Komparisons, Discrepancies in Commercial Kombuchas” Biology Senior Symposium, Lawrence University Appleton, WI June 2021
- “CLIFFORD, a Predictive Operating Room Duration Model” Summer Intern Symposium, HCA Healthcare, Nashville, TN, Aug 2019
- “Effect of Fenugreek on Embryo Development” First Year Research Project Session, Lawrence University, Appleton, WI Nov 2017

Poster:

- “Comprehensive adult female mouse atlas of cortical perineuronal net expression changes with maternal experience” Society for Neuroscience, Chicago, IL 2024
- “Unsupervised clustering of mouse pup ultrasonic vocalizations did not identify distinct call types for efficient pup retrieval by adult female mice” Society for Neuroscience, Chicago, IL 2024
- “Unsupervised clustering of mouse pup ultrasonic vocalizations did not identify distinct call types for efficient pup retrieval by adult female mice” Gordon Research Conference: Neural Mechanisms of Communication, Neury, ME May 2024
- “Machine learning analyses of ultrasonic vocalizations during pup retrieval in a mouse model of Rett syndrome” Motor Speech Conference 2024, San Diego, CA Feb 2024
- “Using computational approaches to generate trajectories and predict goal related movements of pup retrieval behavior” 2022 International Rett Syndrome Foundation Conference 2022, Nashville, TN April 2022

Scientific Outreach/Involvement

- Lawrence University Investment Club- Founding member
- Special Olympics Volunteer- Knox County Schools
- Member of Little Vikes community outreach program
- Thrive after school program volunteer
- Curious Science Writers Mentor

Grants and Scholarships

- Richard Warch Honors Scholarship
- Lawrence University More Light Scholarship
- Lawrence University Renewable Grant
- HCA Foundation Scholarship (2020)
- Colonel Henry Irwin and Genevieve Budd Weed Memorial Scholarship (2018-2021)