REED T. BJORK

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SUMMARY

Curiosity-driven scientist and solution-oriented engineer with research experience in the public and private sectors spanning neurodegenerative diseases, cancer biology, regenerative medicine, tissue engineering and pathology, and device design. Extensive technical background in biochemical assays, fluorescence imaging, behavioral characterization, experimental design and data analysis. Strong communication skills across a range of teaching and leadership roles including nine semesters as a graduate teaching assistant.

EDUCATION

University of Arizona

PhD | Neuroscience Aug. 2020—May 2025

Minor | Molecular and Cellular Biology

University of Wisconsin-Madison

MS | Biomedical Engineering Jan. 2017—Dec. 2017

BS | Biomedical Engineering Sept. 2011—Dec. 2016

Focus | Biomaterials and Tissue Engineering

ACADEMIC RESEARCH EXPERIENCE

Graduate Research Assistant | University of Arizona, Neuroscience Oct. 2022— *Present*

Thesis Advisor: Julie Miller, PhD

Alpha-synuclein neuropathy and consequences for birdsong in zebra finch basal ganglia

I use immunohistochemistry and fluorescence microscopy to visualize the localization of alpha-synuclein under physiological and pathological conditions. Analysis and AAV treatments conducted in zebra finch basal ganglia song center, Area X.

Graduate Research Assistant | University of Arizona, Molecular and Cellular Biology June 2021—June 2022

Advisor: Daniela Zarnescu, PhD (*moved to Penn State June 2022*)

Modelling TDP-43 proteinopathy in Drosophila mushroom body neurons

Used an RNA immunoprecipitation technique to isolate and identify RNAs sequestered within TDP-43 condensates. Conducted RT-qPCR, adult fly brain dissections, immunohistochemistry, and behavior assays (sleep and Y-maze).

Research Assistant | UW Health, Transplantation May 2017—Aug. 2017

Principal Investigator: Dixon Kaufman, MD, PhD, FACS

Stem cell engraftment in non-human primates following kidney transplantation

Isolated immune cells from rhesus macaques following kidney transplantation with stem cells administered to reduce host rejection. Used multi-color flow cytometry and FlowJo software to evaluate the acquisition of immune cell chimerism.

Engineering Student | University of Wisconsin-Madison, Biomedical Engineering Jan. 2015—Dec. 2017

Advisors: Kevin Eliceiri, PhD and Dixon Kaufman, MD, PhD, FACS

Organ cooling system for kidney transplantation

Collaborated with a team of BME students to design and fabricate a novel prototype for automated kidney preservation during the backbench procedure of transplantation. *Ex vivo* experiments using porcine kidneys confirmed the device's precise temperature control. Project was funded under the BerbeeWalsh Prototype Pathway fund.

Research Assistant | University of Wisconsin-Madison, Cell and Regenerative Biology Sept. 2014—Dec. 2015

Principal Investigator: Patricia Keely, PhD

Dynamics of breast cancer cell protrusions during migration in 3D collagen matrices

Constructed 3D collagen scaffolds using microfluidic channels to recapitulate breast tumor microenvironment. Used epifluorescence microscopy and MATLAB to analyze number and directionality of cell membrane protrusions.

PROFESSIONAL EXPERIENCE

Research Technologist | Mayo Clinic, Center for Regenerative Medicine April 2019—Nov. 2019

Principal Investigator: Andre Terzic, MD, PhD

Stress tolerance in mice carrying a cardiac K-ATP channel polymorphism

Harvested mouse tissue and characterized genotypes using PCR and SDS-PAGE gel electrophoresis. Practiced husbandry and performed various physical stress tests on mice.

Co-op Engineer | Fresenius Kabi, Research and Technologies Lab Aug. 2013—Dec. 2013

Investigator: Chris Wegener, Principal Engineer May 2014—Aug. 2014

A novel apheresis method for collection of concentrated red blood cells

Collaborated with two co-op/intern engineers to design and build a proof-of-concept prototype for double red cell collection using a new apheresis technology. Project has since been approved for $50M commercial development (2018).

Undergraduate Research Fellow | Mayo Clinic, Physiology and Biomedical Engineering June 2013—Aug. 2013

Principal Investigator: Gary Sieck, PhD

Assessing diaphragm fiber type specificity of adeno-associated virus (AAV) vectors

Injected mice with various GFP reporter AAV vectors to determine serotype tissue specificity for targeted delivery of growth factors following spinal cord hemisection. Practiced immunohistochemistry and confocal imaging.

PUBLICATIONS

Bjork, R. T., Patel, F. Z., Daly, M. S. & Miller, J. E. (2025). Evaluating Alpha-Synuclein Neuropathy and Consequences for Birdsong in Zebra Finch Basal Ganglia Area X. 'Under review' at Behavioural Brain Research. Available at SSRN: http://dx.doi.org/10.2139/ssrn.5136982

Godfrey, R. K., Alsop, E., **Bjork, R. T.**, Chauhan, B. S., Ruvalcaba, H. C., Antone, J., Gittings, L. M., Michael, A. F., Williams, C., Hala'ufia, G., Blythe, A. D., Hall, M., Sattler, R., Van Keuren-Jensen, K., & Zarnescu, D. C. (2023). Modelling TDP-43 proteinopathy in Drosophila uncovers shared and neuron-specific targets across ALS and FTD relevant circuits. Acta Neuropathologica Communications, 11(1), 168. https://doi.org/10.1186/s40478-023-01656-0

Bjork, R. T., Mortimore, N. P., Loganathan, S., & Zarnescu, D. C. (2022). Dysregulation of Translation in TDP-43 Proteinopathies: Deficits in the RNA Supply Chain and Local Protein Production. Frontiers in Neuroscience, 16, 840357. https://doi.org/10.3389/fnins.2022.840357

TEACHING

Graduate Teaching Assistant | University of Arizona, Neuroscience Aug. 2022—*Present*

Molecular and Cellular Biology of Neurons 310
Spring 2023 | Summer 2024 (Arizona Online) | Spring 2025

I attend all lectures and provide guidance during in-class exercises. I host office hours and exam review sessions and assist with grading quizzes and exams. In the summer 2024 term, I was the lone instructor for this asynchronous 5-week Arizona Online course. Formerly a 7-week course, I restructured the class to fit the new 5-week schedule, trimming homework questions and rewriting exams. I conducted all grading.

VIP-CURE: Brain Communication Networks 397
Fall 2023 | Spring 2024

I hosted lab sections where I provided guidance on the basics of working with fruit flies, such as setting up crosses and identifying sex, phenotype, virginity/mating status. I also assisted in drafting a sourcebook for the course.

Cellular Neurophysiology 307
Fall 2022 | Fall 2024

I attended lectures, hosted office hours and exam review sessions, and also assisted in grading quizzes and exams.

Paraprofessional | Rochester Public Schools Feb. 2018—June 2018

John Adams Middle School

Assisted in a sixth grade special-ed classroom (Setting 3, E.B.D.) for students with emotional and behavioral disorders. Helped engage the students in novel lessons and mindful classroom activities.

Graduate Teaching Assistant | University of Wisconsin-Madison Jan. 2017—Dec. 2017
Human Physiology 335
Led classroom discussions, laboratory sections, and held office hours for over 500 students.
Designed lesson plans, curated lab content, and assisted in formulating test questions.

Peer Discussion Leader | University of Wisconsin-Madison Sept. 2015—Dec. 2016
Human Physiology 335
Facilitated discussion in a weekly, extracurricular study group for students in the course.
Developed interactive study materials with guidance from the course professors.

Undergraduate Student Advisor | University of Wisconsin-Madison Aug. 2012—Dec. 2014
Introduction to Engineering Design 160
Counseled freshmen students in an interdisciplinary engineering design course.
Assisted the professors in developing lesson plans, supervising labs, and grading coursework.

ADDITIONAL LEADERSHIP ROLES

Student Representative — Self-Study APR Committee | University of Arizona, Neuroscience May 2024—Nov. 2024
I was invited by the director of the Neuroscience department to serve as the graduate student representative on the academic program review (APR) committee for the undergraduate Neuroscience and Cognitive Science (NSCS) major, a self-study occuring every seven years. I assisted with research and composition of the report, particularly the sections comparing the NSCS major with similar programs at other peer institutions.

Assistant Coach — Track and Field | Rochester Lourdes High School Feb. 2018—June 2018
I coached hurdles for boys and girls track and field, on my former high school team with my former coaches. I helped an 800m runner transition to 300m hurdles; she finished the season as a section finalist in the event.

Chair — Biomedical Student Advisory Committee | University of Wisconsin-Madison Jan. 2016—May 2017
Organized and led biweekly meetings for discussion betweeen students and faculty, helped implement respective changes to the program curriculum, and spearheaded a new mentoring program.

President — Euchre Club | University of Wisconsin-Madison Sept. 2013—May 2016
Organized weekly meetings for students to come together and play the card game Euchre. I was a founding member and facilitated a four-fold increase in club membership during my presidency.

CONFERENCE POSTER PRESENTATIONS

The silence before the storm: understanding early mechanisms of alpha-synuclein proteinopathy in a songbird model of vocal dysfunction. Patel, F.Z., Bjork, R.T., Daly, M.S., Miller, J.E.

Presented at: Society for Neuroscience Conference (2024)

Alpha-synuclein overexpression in the basal ganglia vocal nucleus, Area X, alters waveform patterns in a zebra finch model of Parkinsonian vocal deficits. Dominguez, B.R., Holguin, G., Bjork, R.T., Cowen, S.L., Miller, J.E.

Presented at: Society for Neuroscience Conference (2023)

TDP-43 expression in dementia-relevant circuits causes axonal degeneration and behavioral deficits in Drosophila. Godfrey, R. K., Bjork, R. T., Cowell, H. C., Hala'ufia, G., Williams, C., Lehmkuhl, E.M., Alsop, E., Van Keuren-Jensen, K., & Zarnescu, D. C.

Presented at: Arizona Alzheimer's Consortium (2021), Drosophila Research Conference (2022)

GRANTS and AWARDS

Core Facilities Microscopy Grant (Miller and Bjork, co-contributors) | **University of Arizona**, *March 2024*
Research and Project Grant | University of Arizona, *Feb. 2024*
Herbert E. Carter Travel Award | University of Arizona, *April 2022*
Undergraduate Research Fellowship | Mayo Clinic, *June 2013—Aug. 2013*
Buske, Gilbert, & Genevieve Scholarship for Biomedical Engineering, *Jan. 2012*

References - Available Upon Request