

Tyler Bradshaw, PhD

DEPARTMENT OF NEUROBIOLOGY, DUKE UNIVERSITY

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Summary

I am a diligent and driven computational and molecular biologist. In my PhD work, I combined cutting-edge spatial and proximity proteomics tools to solve problems in molecular neuroscience. I am a self-taught programmer and data scientist, and have pioneered novel computation pipelines and molecular techniques in numerous projects aimed at understanding the organization of the neuronal proteome and its dysregulation in disease. I am interested in a career where I can continue to draw together ideas and approaches spread across the fields of proteomics and computer science to help bridge gaps in our understanding of the biology of cells and the molecular mechanisms underlying human disease.

Work Experience

Graduate Research Assistant

Fall 2016 - April 2021

SODERLING LABORATORY, DUKE UNIVERSITY

Department of Neurobiology

- Development of spatial proteomics analysis pipeline for clustering and linear model-based inference in multiplex spatial proteomics.
- Recipient of a Ruth L. Kirschstein National Research Service Award Fellowship (NRSA F31) to study the molecular mechanisms of a rare epilepsy disorder.
- Application and development of CRISPR-based methods for genetic depletion and tagging of endogenous proteins.
- Performed synapse biofractionation and proteomics to assess synaptic changes in multiple mouse models of human brain disorders.
- Application and analysis of proximity proteomics for identification of subcellular specific proteomes.
- Clustering and analysis of protein biological networks.

Research Technician

May 2014 - May 2016

SODERLING LABORATORY, DUKE UNIVERSITY

Department of Cell Biology

- Protein co-immunoprecipitation and proximity proteomics for identification of protein-protein interactions and revealing protein interactomes *in vivo*.
- Performed immunoblotting, immunostaining, and cell and tissue culture for assessing protein expression and localization *in vitro* and *in vivo*.
- Molecular cloning and generation of adeno associated virus for transgene expression *in vivo*.
- Maintained mouse colony with >30 strains of mice; performed mouse surgery, husbandry, genotyping, and analysis of mouse behavior.

Skills

Computational Biology

- Linear models and linear mixed-models in R
- Clustering and visualization of protein networks
- Analysis of biological network organization and function
- DevOps toolchain: Windows, Linux, Tmux, Vim, LaTeX, R, Python, Julia, Cytoscape, Adobe Illustrator

Molecular Biology

- Molecular cloning and plasmid design
- Molecular biology using immortalized human cell lines, E. coli, and yeast
- Protein purification, co-immunoprecipitation and immunoblotting
- Production of adeno associated virus and stereotaxic injection into mouse brain tissue
- Subcellular fractionation and TMT multiplex proteomics

Education

Duke University, Department of Neurobiology

Durham, NC

DOCTOR OF PHILOSOPHY - NEUROBIOLOGY

Fall 2016 - May 2021

- Dissertation: Statistical Inference and Community Detection in Proximity and Spatial Proteomics

University of Washington

Seattle, Washington

BACHELOR OF SCIENCE - MOLECULAR, CELLULAR AND DEVELOPMENTAL BIOLOGY

Fall 2010 - Spring 2014

- My undergraduate research focused on type II and type I diabetes in the Surgical Outcomes Research Center and Bornfeldt Laboratory, respectively.