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 cellular biology of human health and 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 the Ruth L. Kirschstein National Research Service Award (NRSA) Individual Predoctoral Fellowship (F31) to study the molecular mechanisms of a rare epilepsy disorder.
- Application and development of CRISPR-based methods for genetic depletion and tagging endogenous proteins.
- Performed synapse biofractionation and proteomics to assess synaptic mechanisms underlying mouse models of genetic neurodevelopmental disorders.
- Appliction and analysis of BioID proximity proteomics for identification of subcellular specific proteomes such as the postsynaptic proteomes of excitatory and inhibitory synapses.

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 assessing a protein's interactome.
- Established use of CRISPR-based tools for gene depletion and interrogation of synaptic protein function.
- 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.
- Gene set enrichment analysis.
- DevOps toolchain: Windows, Linux, Tmux, Vim, LaTex, R, Python, Julia...

Molecular Biology

- Molecular cloning and plasmid design
- Virus production and stereotaxic injection
- Subcellular fractionation
- Cell and neuronal tissue culture

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

Unversity 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.