

## Researcher Spotlight: Paul McKeever, Ph.D.

ALS doesn't stop and neither do we. The reality is, people with ALS can't wait for treatments and a cure, and just as importantly, the tireless researchers working together around the world can't wait to make the next breakthrough. Researchers like our 2019 Milton Safenowitz Postdoctoral Fellowship Program recipients.

Our [Milton Safenowitz Postdoctoral Fellowship Program](#) continues to support young scientists and is the only program of its kind specifically funding early ALS postdoctoral fellows eagerly searching for a cure.

The awards were founded in memory of Mr. Safenowitz by the Safenowitz family through The ALS Association Greater New York Chapter. The program encourages young scientists to enter and, importantly, to remain in the ALS field.

We are proud that 76 percent of the postdoctoral fellows we fund go on to start their own labs to continue studying ALS and mentor other young ALS researchers. The rest of our Safenowitz fellowship program graduates go on to careers in the biomedical industry, nonprofits, and medical writing, with many still staying in the ALS space.

This year, we are supporting six new postdoctoral fellows out of a highly competitive applicant pool. Over the next few weeks, we will highlight each fellow, their dedication and unique contributions to ALS research, as well as their interests outside of the lab.

We recently spoke with Dr. Paul McKeever from the Rogaeva lab at the Tanz Centre for Research in Neurodegenerative Diseases at the University of Toronto. Paul's current research project is focused on uncovering the molecular programming which make individual brain cells and populations of cells susceptible or resilient to the disease process so that new therapeutic avenues can be developed for patients with ALS and FTD.

Paul McKeever, Ph.D.

[Rogaeva lab at the Tanz Centre for Research in Neurodegenerative Diseases, University of Toronto](#)

**Project:** Linking brain cell subtype-specific transcriptomic and epigenomic mosaicism in C9orf72-ALS/FTD

**Can you briefly describe your academic background?**

While pursuing a Bachelor of Science (B.Sc.), I found myself fascinated by the inner workings of the brain and began to specialize with an Honours B.Sc. in Neuroscience. During this time, I felt a significant pull towards laboratory research as a crucial means of tackling diseases of the

central nervous system. This experience culminated in the completion of a Doctorate in molecular biology and bioinformatics studying the underpinnings of neurodegenerative diseases.

**It is said that every 90 minutes, someone is diagnosed with ALS and every 90 minutes someone dies from the disease. Time is not on the side of those who are diagnosed, and no matter what issues we are all currently facing in the world, ALS won't stop, so neither will we. What are you doing to address the urgency our ALS community is feeling?**

We need to continue the momentum brought on by all the new discoveries in ALS recently, take these findings back to the lab, and uncover novel, effective therapeutic approaches.

**What are the goals of your funded research project?**

Research has shown that ALS is a non-cell autonomous disease, whereby both glia and neurons are affected by the disease process. My research project aims to uncover the gene expression and epigenetic changes affecting diverse cell subtypes in ALS by combining the recently developed single nucleus RNA sequencing and assay for transposase accessible chromatin (ATAC) sequencing technologies. The goal of this novel, unbiased approach is to identify the molecular mechanisms that make individual cells and populations of cells susceptible or resilient to the disease process so that more directed therapeutic targets can be uncovered and developed.

**Why did you decide to study ALS over other diseases?**

While completing my doctorate, I worked closely with an incredible research partnership between the Tanz Centre for Research in Neurodegenerative Diseases and the ALS Clinic at Sunnybrook Health Sciences Centre at the University of Toronto, Canada. This collaboration comprises a phenomenal team of clinicians and researchers, including Professor Janice Robertson, Dr. Lorne Zinman, Dr. Julia Keith, and Professor Ekaterina Rogava. Here, I met many inspiring people and families living with ALS whose generosity has been crucial in allowing this research to occur. Hearing their stories and experiencing their endless energy, especially at local charity events, motivated me to pursue a career in ALS research.

**What do you like about working in the ALS research field?**

The ALS field is a highly collaborative and multidisciplinary network of focused researchers unwavering in their motivation to tackle ALS. Every day, I look forward to contributing to this urgent endeavor.

**How might your work impact the ALS community?**

Since diverse cell subtypes are affected in ALS, I am hopeful that my research project will revolutionize our understanding of the disease by providing a link between cell subtype-specific gene expression and epigenomic mosaicism. If we can refine our understanding of the cellular mechanisms that are either protective or drive susceptibility in ALS, this has the potential to reveal new therapies. I am also excited by the fact that this work will also provide a valuable dataset to share with the field to drive further discovery.

**Where can people get more details about your research project?**

Stay tuned! All data produced from this project will be made publicly accessible and searchable through an interactive Shiny app webpage.

**It is often said that ALS is one of the most complex diseases to understand. Yet, you go to work every day to tackle the challenges of your research. What gives you hope that there will someday be a world without ALS?**

In recent years, we have made remarkable progress towards a better understanding of the causes of ALS. From these critical discoveries, many novel therapeutics are currently in clinical trials and we are steadfast in our commitment towards developing a cure.

**What do you like to do when you aren't in the lab?**

Outside of the lab, you can find me spending time with family and friends, cycling the countryside, playing classical piano, or keeping up to date on news.

**Is there anything else you'd like to add?**

I extend my deepest gratitude to all the amazing and generous people and families living with ALS you have inspired and humbled me. Further, I wish to thank The ALS Association and the Milton Safenowitz Postdoctoral Fellowship Program for supporting my research project