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Laidlaw Scholars Undergraduate Leadership and Research Programme
Record of Reflection

Resilience in Action: Leadership Lessons From Parkinson's Disease Research

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Introduction

This summer, I had the privilege of conducting research at Krembil Brain Insititute as part of my first summer in the Laidlaw Scholars Program. My project, Peripheral Immune Dysregulation in Parkinson's Disease Through Integrative Analysis of Human Transcriptomics and Preclinical Validation, combined computational analysis with experimental validation. The aim was to better understand how peripheral immune dysfunction may contribute to Parkinson's Disease (PD), and to identify any immune-related biomarkers that could shed light on disease mechanisms.

While the computational and experimental findings themselves were exciting, what stood out to me most from my experience this summer was the way the research process shaped how I approach leadership in my field. Through moments of success and challenge, I developed resilience, honed my communication skills, learned to collaborate with my team more effectively, and perhaps most profoundly, I grew immensely in time management as I navigated ongoing health struggles during my research period.

The Research Process

I conducted my work in two key phases. First, I focused on computational transcriptomics, analyzing peripheral blood mononuclear cell (PBMC) data to identify shifts in immune signatures associated with different Parkinson's Disease states. This phase required learning to work with large datasets, troubleshoot technical issues, and extract meaningful insights from the graphical outputs of the differential expression analyses.

In the second phase, I moved to experimental validation. Using a preclinical mouse model, I prepared gut and spleen tissues to assess immune cell markers through immunofluorescence staining. These experiments were time-sensitive and detail-oriented, requiring precision throughout the procedure. Small errors could mean repeating days of work, so I had to practice patience and meticulous planning.

Both phases demanded adaptability; the datasets were sometimes incomplete, staining protocols occasionally had errors, and results were not always as clear to interpret as what I was expecting. Yet these challenges were also an opportunity to strengthen problem-solving and persistence; key elements of scientific leadership.

Leadership Skills in Action

The most transformative leadership skill I developed this summer was time management. Alongside my research responsibilities, I was balancing unexpected hospital visits and ongoing health struggles that often disrupted my schedule, and the planned research objectives I would set out for myself that week. Rather than viewing this as a limitation or a reason to give up, I used it as motivation to maximize every productive window. I created detailed to-do lists on the days I could physically be present in the lab, and I spent long hours on those days to stay on track with my project's rigid timeline. I also learned to break large tasks down into smaller objectives that I could complete within a day, and I learned to prioritize the most impactful tasks of each day.

This discipline not only kept my research on track, but also deepened my resilience. I learned that leadership begins with leading oneself; staying organized, adaptable, and positive even when external circumstances are unpredictable. There were moments when I felt frustrated with myself for not being able to physically show up for my project during periods when my health was suffering. Yet these experiences taught me the importance of prioritizing recovery

and channeling my energy strategically, so that I could be fully productive on the days I was in the lab. I also learned to show myself grace during difficult mental health moments; the unexpected passing of my best friend during the research period, for instance, understandably affected my productivity. Navigating these challenges reinforced a critical aspect of leadership: guiding oneself with empathy and resilience, understanding that personal well-being is essential for sustaining focus, making thoughtful decisions, and contributing effectively to a team.

Working independently for long stretches required me to be self-directed. Without constant oversight, I had to hold myself accountable to deadlines, monitor progress, and adjust plans when experiments or analyses took longer than expected. I learned to celebrate small wins, like troubleshooting a script or obtaining a clean set of tissue images, as markers of growth, development, and forward movement.

While self-leadership was essential, so too was collaboration in the lab. I relied on my supervisor and the grad students in my lab for feedback and guidance, and I learned the importance of clarification and asking questions strategically. Simultaneously, I sought to contribute back to my team, whether by sharing ways I troubleshooted an issue, or helping my team with related tasks. True leadership is reciprocal, and I discovered the balance between independence and interdependence.

Communicating my work was another critical skill. I presented my preliminary findings at lab meetings, created a scientific poster for the UHN Research Day at Toronto General Hospital, and practiced explaining my project to audiences with varying levels of background knowledge. Translating complex immunological and computational concepts into accessible narratives taught me clarity, adaptability, and confidence as a communicator.

Finally, I developed strategic thinking by linking the computational and experimental phases of my project. Instead of treating them as separate tasks in my project, I designed experiments that validated the key computational findings, ensuring efficient use of lab resources and time. This integrated approach mirrored leadership itself: connecting different perspectives to achieve a cohesive outcome.

Personal Growth and Lessons Learned

Looking back, the most powerful lesson I learned is that leadership is not only about guiding others; it is also about guiding yourself through adversity. My time in the hospital forced me to value every hour of lab work, to prepare backup plans, and to remain composed when my schedule changed unexpectedly. These experiences taught me not only discipline, but also empathy for others who may be facing unseen challenges.

I leave this summer with stronger confidence in my scientific research abilities, deeper appreciation for collaborative work, and sharpened skills in time management and resilience. These lessons extend beyond the lab. Whether in future research, academics, or professional life, I now carry tools to lead with adaptability, empathy, and perseverance.

Conclusion

This summer of Parkinson's Disease research was both a scientific and personal journey. I learned how to extract insights from complex data, design and execute experiments, and communicate findings to different audiences. But even more importantly, I grew as a leader, especially in resilience and time management while navigating personal health challenges.

I am deeply grateful to the Laidlaw Scholars Program, my supervisor, and my lab team for making this experience possible. The skills I developed this summer will guide me not only as a researcher, but also as a future leader committed to discovery, perseverance, and impact.