

RESL 1500 – Reflective Essay

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Throughout my undergraduate degree in chemistry at Thompson Rivers University (TRU), I have engaged in diverse research projects across multiple chemistry disciplines. These experiences have not only broadened my perspective on research but have also equipped me with invaluable skills such as problem-solving, critical thinking, and data analysis. Beyond technical abilities, they have shaped the way I approach scientific inquiry, communicate findings, and navigate challenges both in research and in everyday life.

When I first entered my undergraduate studies, I had only a vague idea of what research entailed. I knew it was important and that I should be involved, but I had little understanding of my potential role or how to even get started. The idea of research felt overwhelming—an expansive, uncharted territory that I was unprepared to navigate. Fortunately, with guidance from Sukh Heer Matonovich at the TRU Research Office, I was able to take my first steps into the research world. Through the mentorship of Dr. Kingsley Donkor and research-focused coursework, I gradually gained confidence and experience. Since then, I have completed multiple research projects, including a UREAP, NSERC USRA, and directed studies. These opportunities not only expanded my technical expertise but also allowed me to give back to the research community by mentoring students as a Research Coach, helping others who were in the same uncertain position I once was.

My first research experience as a Research Assistant to Dr. Kingsley Donkor completely changed my perception of what research involved. TRU provided an environment where I could gradually develop my skills without feeling overwhelmed. Under Dr. Donkor's mentorship, I was introduced to advanced instrumentation, such as Liquid Chromatography-Mass Spectrometry (LC-MS), which I had previously only encountered in Chem 2100: Analytical Chemistry. For the first time, I was able to bridge the gap between classroom theory and practical application by developing analytical methods and optimizing parameters to improve resolution and data quality. Additionally, I gained hands-on experience in sample preparation, learning techniques essential for independent laboratory work.

Building on this foundation, I applied for and received an Undergraduate Research Experience Award Program (UREAP), which introduced me to the research process in a more comprehensive manner. My project focused on the sensitive detection of nisin in food products using Capillary Electrophoresis (CE). Beyond learning a new instrument, I was responsible for preparing and submitting a research proposal, managing a structured research timeline, and writing a final report—skills that are fundamental to any scientific career. This experience was pivotal because it marked the first time I conducted research in an official capacity, navigating the formal requirements of grant-funded work.

Beyond my own technical and analytical growth, these research experiences allowed me to support others entering the field. As a Research Coach, I worked alongside a peer to guide students through research projects, from inception to dissemination. This experience solidified my understanding of the research process while also providing an opportunity to mentor others, sharing insights and advice that I wished I had received when I was starting out.

The summer before my final undergraduate year was when everything truly came together. I was fortunate to receive an NSERC USRA to conduct research at the University of Alberta with Dr. X. Chris Le. This experience introduced me to a dynamic research environment, where I collaborated with graduate students pursuing their master's and PhDs, as well as postdoctoral researchers. I participated in lab meetings, observed thesis defenses, and saw first-hand how scientific discussions shaped the progression of research projects. These experiences refined both my technical and communication skills, exposing me to the high standards of academic research.

My project at the University of Alberta focused on the determination of heavy metals in vegetables and the speciation of arsenic using chromatography and mass spectrometry. Working with Inductively Coupled Plasma Mass Spectrometry (ICP-MS) was a significant learning experience, as was my exposure to lab practices such as using Standard Reference Materials (SRMs) for method validation. Additionally, I contributed to a

publication on enzyme digestion for arsenic speciation, which provided invaluable insight into the peer-review and editorial process. The experience of co-authoring a scientific paper and navigating revisions with journal editors was a defining moment that boosted my confidence as a researcher.

Looking ahead, I intend to apply the skills and knowledge I have gained toward furthering my studies as I pursue an MSc with Dr. X. Chris Le. My experiences at TRU have provided me with a strong foundation in analytical techniques and research methodologies, while my time at the University of Alberta has prepared me for the collaborative and rigorous nature of graduate-level research. The problem-solving skills, technical expertise, and ability to communicate scientific findings that I have developed will be instrumental in my graduate studies and future career in analytical chemistry.

Research has shaped the way I think, work, and approach challenges. What once felt intimidating has now become an exciting and rewarding pursuit. My journey from uncertainty to confidence in the lab has been filled with invaluable learning experiences, and I look forward to continuing to push the boundaries of my knowledge and contributing to the field of chemistry in meaningful ways.