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To the Brain Tumour Foundation of Canada,

It is with great appreciation that I am sending this final report to conclude my 2013-15 research studentship generously provided to me by your organization and its donors. Of course, the end to a good experience is never easily met but the invaluable knowledge and experience I have gained from this has positively influenced my own life and I hope will one day help others. Before I begin with the summary and outcomes of my I would like to thank you, the Brain Tumour Foundation, its donors and its supporting members, for the opportunity granted to me.

**Project Outcomes:**

When we first began the project not much was known about how certain drugs, specifically CDK-inhibitors, affect the many processes involved in cell cycle regulation and tumour suppression. Our aim is to study the effects of CDK-inhibitors on brain tumour cells *in vitro* and *in vivo*. Part of doing this is to develop an animal model to study the effect of these drugs on a large scale with various cell lines and drugs. The summer of 2014 was largely spent observing cells *in vitro* and the changes caused specifically when a gene called SPDYA, which encodes the Spy1 protein, was overexpressed. Spy1 has been shown to be overly abundant in many malignant tumours and is currently being investigated by our lab to further elucidate exactly what it is doing in the cells. Since beginning my research studentship with Dr. Porter (under the supervision of her graduate student Janice Tubman) we have nearly completely optimized and developed an *in vivo* zebrafish model for the large scale testing of drugs on tumour metastasis. The benefits of this model is that it is cheap, relatively easy to perform, time efficient and provides the accuracy commonly associated with *in vivo* models. The simplicity of the model also leaves it open to making a partially automated system to more easily control environmental conditions, dosage, data acquisition, etc.

This research can improve the treatment that brain tumour patients receive by allowing novel therapeutic approaches to be investigated on a patient tumour cells in the animal model. This will allow for more accurate assessment of the efficacy of the treatment received by the patient. In the future, more data collection from various cell lines and drug trials will help to further optimize and refine the model. CDK-inhibitory drugs show much promise in the area of chemotherapeutics specifically for cancers but can also be investigated for other non-cancerous tumour causing illnesses. Further investigation into how CDK-inhibitory drugs affect the Spy1 protein in multiple cell lines is therefore the next upcoming goal in research. Of course, these goals and others (with some adjustment to the protocol) can be realized much more easily with the use of our zebrafish model.

**Personal Impact:**

Receiving the 2013-15 research studentship has made the last two years the most productive, educational, enriching, challenging and defining years of my life. Looking back, I sometimes wonder what would have happened had I not been awarded the opportunity to research cancer. I certainly would not have learned any of the skills and knowledge I have now until much later on. However, work experience is only a small (but nonetheless important) aspect of my experience. The people I have met at Brain Tumour support group meetings and at the Spring Sprint as well as the shear amount of time and effort my colleagues in the lab put into the fight against cancer and illness really outlines just how devastating cancer is. All of them great people, they outlined the meaning of hard work and what it means to fight for something. At the same time they showed me what truly living and enjoying life is about. Unfortunately, several individuals whose company I greatly enjoyed at the meetings have passed away but I will never forget the mark they've made on my life and I think I am so fortunate to have had what time I did with them. In addition to all of this, I've learned a great deal about myself and what exactly my aspirations are for the future. That, to me, makes this experience truly invaluable.

After these two years of research, I have greatly expanded my knowledge and understanding of various scientific and personal matters. From this studentship I have renewed aspirations of continuing on in a scientific setting and many doors are now open to me that were not open before. I plan on continuing my research in the future with a different approach. I realized that my strengths and interest lie greatly in physical chemistry as well as biochemistry and I am hoping to use these to my full ability to continue researching cancer. In conclusion, receiving this award showed me the best way for me to change more lives and help people as well as put me on a path to achieve my goals; something a lot of people my age don't get to experience.

In closing, I would like to thank you all for the amazing opportunity and experience you have made possible. I would also like to quickly thank Dr. Lisa Porter, Janice Tubman, Jamila Mamat, Samer Jassar, Diana Mohamad and the rest of Porter Lab for their support, guidance, and good company over the years. Though no publications have been made as result of my work yet, some of my work may be included in one in the future. Once again, thank you for the opportunity and experience of a lifetime. I hope that what work I have done helps even in the slightest to better the livelihoods of people suffering from brain tumours, cancer and other diseases. Even if I made a miniscule difference, that to me is much more real than anything else I have achieved.

With utmost gratitude and appreciation,

Spencer Briguglio