Samer Jassar
University of Windsor
August 31st, 2015

Progress Report to Brain Tumour Foundation of Canada

What We Currently Know:

As a result of your continued support and generosity, over the past summer we have continued to study the efficacy of targeting cell cycle regulators in the treatment of medulloblastoma (MB). The objectives of our study were two-fold: (1) we conducted studies to determine if the atypical cyclin-like cell cycle protein, Spy1, was present in the sonic hedgehog (SHH) subtype of MB, and (2) we studied the role of Spy1 on the effectiveness of specific cyclin-dependent-kinase inhibitors (cancer therapeutic agents).

We first analyzed protein expression in two SHH MB cell lines. Our results showed that Spy1 protein is expressed in SHH MB. Additionally, further data suggested that Spy1 levels are elevated in the tumour initiating cell population and that Spy1 may be required for their self-renewal. When MB cells with Spy1 protein knockdown were injected into the brain of a Zebrafish model organism, a decrease in the number of tumour cells was noted in comparison to cells that were injected without the knockdown. Lastly, when we treated the injected cells with a synthetic cyclin-dependent-kinase inhibitor, the cells with Spy1 knockdown exhibited greater sensitivity to the inhibitor as compared to the cells without Spy1 knockdown. Thus, these studies have provided evidence suggesting that Spy1 may potentially be playing a role in the tumourigenesis of MB.

Future Directions:

Although our evidence indicates that Spy1 may play a role in MB tumourigenesis, further experiments are needed to fully confirm this finding. Our future directions include repeating specific experiments and trials for statistical significance. Additionally, it would be beneficial to test our findings in another animal model, such as in mice. We would then hope to conduct clinical trials to determine if Spy1 protein levels are elevated in patients with aggressive MB. The future goal of this would be to eventually design selective therapeutic targets to block the effects of Spy1. This would be tested in numerous animal models where these agents would eventually enter clinical trials on patients, either in combination with chemotherapy and cyclin-dependent kinase inhibitors, or alone. This would give us the ability to measure patient outcomes with these treatments and determine their effectiveness on the overall prognosis.

Personal Impact of this Award:

I am very thankful and blessed to have been given the opportunity and privilege to conduct research under the supervision of Dr. Lisa Porter. During my undergraduate years, while classes were incredibly important to me, I felt that research was what broadened my horizons and taught me how to think critically. I have learned that research requires a passion and patience to pursue something that may not work out. Furthermore, from my research experiences in the Porter Lab, I have developed a true understanding for science. I can undoubtedly say that it has prepared me to excel in any field that I wish to pursue. The relationships and connections I have built with others at my institution are incredible. It was a pleasure being able to work with individuals who encompass a similar mind-set and end goal; to contribute to the field of science.

The studentship from Brain Tumour Foundation of Canada has given me the opportunity to give back to the community in ways I could never imagine. I had always heard about friends and family members that were affected by cancer but I never knew how I could help them in ways other than fundraising money. Attending the brain tumour monthly support meetings with brain cancer patients gave me another reason to continue working hard and going the extra mile in my experiments. I made it an effort to give 120% in my work since it was possible that one day it could be my friend or family member at the support meeting. I owed it to myself, the patients, and generous donors to work as hard as I possibly could to provide donors and cancer patients with results that would hopefully make an impact on their life.

In conclusion, I have been very fortunate to conduct research for such an amazing Foundation. Throughout the years I have grown as a scientist both intellectually and physically in a positive and supportive environment. Additionally, I have come to appreciate the field of science and the hard work that goes into producing great results. My deepest gratitude goes to Brain Tumour Foundation of Canada and to all its donors. Without your support I would not be where I am today. Thank you very much for all of your kindness and assistance.