I completed my BSc with specialization in Pharmacology (with Distinction) in 2011. During the program, I completed a Pharmacology research project as well as an undergraduate summer project where I investigated the protease activated receptor-2 (PAR-2) interaction with endothelial potassium channels and their role in blood vessel relaxation. Directly after completing my undergraduate degree I began graduate school where I have been co-supervised by Drs. Mary Hitt and David Evans.

My project has investigated a novel oncolytic vaccinia virus as a treatment for bladder cancer. One of the major problems in the management of bladder cancer is that up to 80% can recur within 5 years of initial treatment. Treatment for high-risk patients includes transurethral resection to remove the bulk of the tumor followed by intravesical therapy with the immunotherapeutic agent Bacillus Calmette–Guérin (BCG). BCG, however, carries the risk of systemic infection and can be particularly dangerous for immunocompromised patients. Additionally, up to 40% of patients fail BCG therapy and cystectomy remains the standard treatment in these cases.

This study, published in *EMBO Molecular Medicine*, demonstrates the high degree of safety and anti-tumor activity of a novel oncolytic virus in pre-clinical bladder cancer models. Our oncolytic vaccinia virus showed an impressive safety profile, selectively infected a variety of susceptible cell types (including primary human bladder cancer tissues), and infection induced anti-tumor immunity in animal models. Although patients with immune deficiencies and BCG-refractory cancers would be ideal candidates for this therapy, in the longer-term our oncolytic novel virus might offer a more attractive replacement for BCG and potentially reduce the need for surgical management.

I successfully defended my PhD (Experimental Oncology) in August 2017 and the work conducted during this time, much of which is presented in this manuscript, has led to the initiation of a Phase I/II clinical trial investigating our oncolytic virus in bladder cancer patients.