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I completed my Bachelor of Science (Honours) and Master of Science in Biochemistry and Molecular Biology at Shahjalal University of Science and Technology, Bangladesh. During this time, I was first introduced to scientific research, working on a wide range of topics including immunology, biodiversity, and plant biology. My curiosity was particularly sparked by the intricate relationship between genes and their expression in cellular responses, which led to my growing interest in the complexities of mammalian cells. Specifically, I became fascinated by genome editing as a potential approach to treat genetic disorders.

This interest in genetics guided me to the work being done in Dr. Toshifumi Yokota's lab at the University of Alberta, which I joined in the winter of 2021. There, I gained experience with advanced techniques such as mammalian cell culture, RNA editing, drug discovery, and transgenic mouse models. My research focuses on developing a novel peptide-conjugated antisense oligonucleotide (ASO) therapy for Duchenne muscular dystrophy (DMD), a genetic disorder that primarily affects newborn males, causing progressive muscle degeneration from an early age. Patients typically live into their mid-twenties and often die from cardiac complications, a challenge that current treatments fail to adequately address.

The central aim of my work is to overcome this limitation of ASO therapeutics by targeting both skeletal muscle and the heart. In this study, we developed a highly effective treatment strategy that not only restores muscle function but also prevents cardiac complications in DMD. Through extensive testing in humanized mouse models, we demonstrated both the therapeutic efficacy and safety of this approach, positioning it as a strong candidate for future clinical development.