



**COLLEGE of  
BIOLOGICAL SCIENCE**

DEPARTMENT OF MOLECULAR  
AND CELLULAR BIOLOGY

***Announcement:***

*All interested members of the university community are invited to attend  
the Final Oral Examination for the degree of **Master of Science** of*

**BRIAN CHIU**

**On Monday, January 8, 2024 at 1:30 p.m. (SSC 1511)**

**Thesis Title:** Establishing a Model System for Studying the Role of CREB3 in Insulin Secretion from Pancreatic Beta Cells

**Examination Committee:**

Dr. Priyanka Pundir, Dept. of Molecular and Cellular Biology (Exam Chair)  
Dr. Ray Lu, Dept. of Molecular and Cellular Biology  
Dr. Marc Coppelino, Dept. of Molecular and Cellular Biology  
Dr. Jim Uniacke, Dept. of Molecular and Cellular Biology

**Advisory Committee:**

Dr. Ray Lu (Advisor)  
Dr. Marc Coppelino

**Abstract:** CREB3/Luman is a transcription factor that is best known for its involvement in the unfolded protein response. Little is known about CREB3's role in insulin secretion, but it has been shown to be involved in a variety of secretory and metabolic processes such as COPII vesicle formation and regulation of glucose transporter expression.

Insulin is a peptide hormone responsible for lowering blood glucose in the body. It acts through the promotion of glucose uptake and storage by suppression of glucose production. The pancreatic beta-cell is the sole cell type in the body responsible for both insulin production and secretion and will recognize extracellular glucose concentration and secrete the insulin needed to maintain proper glucose homeostasis. Failure to maintain proper glucose homeostasis will inevitably result in Type II Diabetes Mellitus.

The goal of this project is to establish a model system for studying the role of CREB3 in insulin secretion of pancreatic beta cells through CRISPR-Cas9 mediated knockout and to test the role of CREB3 in insulin secretion through various treatments. The results of this study will help us to understand the mechanisms of insulin secretion and could potentially offer insight into the development of treatments for Type II Diabetes.

**Curriculum Vitae:** Brian completed his Bachelor of Science (Honours) in Biology at the University of Western Ontario in 2021. He began his Master of Science program in Molecular and Cellular Biology at the University of Guelph in Dr. Lu's lab that same year.