Insulin is a peptide hormone that is 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.

Luman is a transcription factor that is best known for its involvement in the unfolded protein response. Little is known about Luman’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. Therefore, it is hypothesized that Luman is a regulator of insulin secretion. This project aims to assess the role of Luman in insulin secretion and to validate its role in insulin secretion through the creation of a Luman knockout rat pancreatic cell line. The results of this study will help better understand the mechanisms of insulin secretion and could potentially offer insight into the development and treatment of Type II Diabetes.