Sangeeta Dhawan, Ph.D. Updates

Update on 6-30-17

The project was based on the idea of expanding insulin-producing cells (beta cells) to replenish the cell loss from diabetes. We found a protein able to expand the rapidly proliferating cells found in fetal tissues and proceeded to place the protein within adult beta cells to see if we could make the cells proliferate. Our experiments were successful in the cells treated in culture plates. This finding will be useful for further experiments with expanded cells to replenish the diminished mass of beta cells found in the diabetic pancreas.

Update on 4-12-17

This DRC sponsored project is aimed to develop a model of expanding functional beta cell mass for replenishment therapy. We have identified a key molecular regulator of islet cell proliferation, which marks rapidly expanding, functionally immature beta cells in the fetal life and is absent in functionally mature, non-proliferating beta cells after birth. We therefore proposed to transiently re-express this regulator in beta-cells to drive a rapid burst of proliferation, followed by withdrawal of this factor to stop proliferation and restore beta cell function. Our preliminary data in indicate that inducing this factor in cultured mouse beta cell lines and islets leads to increased proliferation. The generous support provided by DRC has also allowed us to identify additional candidates that can be harnessed to promote islet replication and function. Our ongoing studies are focused on understanding how this factor regulates islet growth and function, and on further developing our beta cell expansion model. This will be a big step towards expanding adult functional insulin-producing cell mass for replacement therapies, and will also provide a way to develop methods for expansion of these cells inside the body. This project will ultimately lead to development of protocols for deriving functional beta cells in abundant quantities for Type 1 diabetes therapy.

Update on 11-2-16

Video Update

Update on 9-1-16

The lab that Sangeeta Dhawan works in has identified a molecular switch that regulates the transition from fast duplication, non-functional insulin cells of the fetus to slow duplicating, fully functioning cells after birth. This molecule is abundant in the fetal insulin producing cells and makes them duplicate fast. After birth, this switch is turned off, including a program for the cells to become functional. Dhawan proposes to turn this switch on in the slow duplicating insulin-producing cells of the adult to push them to duplicate rapidly. Subsequently, she will turn this switch off for the cells to slow down duplication and acquire function. This approach will be tested in the cells in a dish, and a model will be developed to test this idea *in vivo*. This will be a big step towards expanding adult functional insulin-producing cell mass for replacement therapies, and will also provide a way to develop methods for expansion of these cells inside the body.