UNIVERSITY OF MINNESOTA
FOUNDATION

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Dear Lions,

We are very thankful for the generous support your Club has provided over the years. Collectively your contributions have made an enormous impact advancing diabetes research at the University of Minnesota.

The purpose of this letter is to provide you an overview on the projects you support and the impact your gifts have made to advance this research. There are five different projects led by five different researchers. Below is the name of the project, the goal of the project and the impact your gifts have made.

In addition to the advances made in these various projects, many of the studies have led to multiple publications in reputable journals, allowing our scientists to also help other scientists working in diabetes research – thus advancing the research even farther. The overall goal in all the studies is to get into the clinic as quickly as possible to prevent diabetes from first occurring, to better treat those currently suffering from diabetes, and/or to ultimate cure those with diabetes.

Here are the projects the Lions currently support:

PROJECT 1
Project name: Targeting Fat Tissue to Treat Type 2 Diabetes - David Bernlohr, PhD
Project goal: To develop next generation drugs targeting fat tissue to combat Type 2 diabetes.
Funding impact:

- Your support allowed for the discovery of a new drug (HTS01037) to be developed at the Uof MN.
- This new drug (HTS01037) both prevents and reverses insulin resistance in obese experimental mice without needing weight loss.
- End goal is to make this new drug available to these with type 2 diabetes.

PROJECT 2
Project name: Desktop MRI Oxygen Scanner for Assessing Islet Oxygenation in the Bioartificial Pancreas - Mike Garwood, PhD and Paul Wang MD, PhD
Project goal: Construct a low-cost, compact MRI oxygen scanner for ensuring adequate oxygenation of islets transplanted in the bioartificial pancreas.
Funding impact:

- The team developed a bioartificial pancreas for transplantation of islets without the need for immunosuppression drugs.
- They perform many studies using this device, and discovered that supplemental oxygen is required for islets encapsulated within the bioartificial pancreas to function properly after transplantation.
- They developed and construction of a desktop MRI oxygen scanner to monitor oxygen levels inside of the transplanted device, which is critical to allow delivery of the optimal amount of oxygen to support implanted islets in producing large amounts of insulin.
- Now, the device is ready for its first trials in humans to begin later this year

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PROJECT 3

Project name: Breath sensing device for early detection of diabetic ketoacidosis led by Steve Koester, PhD
Project goal: The goal of the project is to develop a device for early detection of diabetic ketoacidosis (DKA) in breath using a novel sensor technology based upon the nano-material graphene.
Funding impact:

- Diabetic ketoacidosis (DKA), a condition with prolonged high blood glucose, is among the most serious complications of diabetes.
- Acetone in breath is one of the early warning signs of DKA.
- Graphene, a single-atom-thick sheet of carbon, can detect acetone in breath.

PROJECT 4

Project name: Curing diabetes by stopping the immune system - Brian Fife, PhD
Project goal: Our goal is to find and control only the "inflammatory" immune cells that destroy the insulin producing cells causing type 1 diabetes, leaving the remaining immune system in tack.
Funding impact:

- Team identified critical targets the immune system attacks, causing diabetes.
- They stopped the immune response against these targets cured mouse diabetes.
- They made human regulatory cells against these targets to test in diabetic patients.

PROJECT 5

Project name: Transplant of Insulin-Secreting Islet Cells without Anti-Rejection Drugs - Bernhard Hering, MD
Project goal: The goal of our project is to ensure survival of pancreatic islet cell and kidney transplants without the need of drugs that suppress the recipients' immune system.
Funding impact:

- The team transplanted over 50 patient in two Phase 3 clinical trials with islet cells from deceased humans. These highly regulated studies were necessary for regulatory approval for human-to-human islet transplantation.
- The team successfully transplanted islets from monkey-to-monkey without the use of anti-rejection drugs with the islets functioning for over year post transplant. This was the first in the world experiment demonstrating tissue being transplanted without antirejection drugs.
- Pig islets functioned for more than 1 year after transplantation using antirejection drugs when the islets were transplanted across species - from pig-to-monkey.

Thank you again for your generous support over the years. It is through your support that these projects have made such progress. The collective impact of the Lions is far reaching and very much appreciated.

Best Regards,

Jean Gorell and Sarah Barsness
University of Minnesota Foundation