

Research Progress Report

Therapeutic Area: Beta Cell Therapies Key Advances Spring 2010

Thanks to the generous support you and other donors have provided, JDRF's Beta Cell Therapies research program has made significant advances in recent months. The program's overall goals are to find ways to restore the body's ability to make insulin and reduce the risk of complications from type 1 diabetes, either through the **Regeneration** or **Replacement** of insulin-producing beta cells. Regeneration focuses on discovering and developing therapies that can trigger the body to re-grow and protect beta cells, as well as convert or reprogram other cells to become beta cells. Replacement focuses on replacing the insulin-producing beta cells killed off by type 1 diabetes with working beta cells derived from external sources. We rely on supporters like you to move this work along as rapidly as possible. Below are highlights of the recent accomplishments you helped make happen.

JDRF-Funded Researchers Identify Gene Critical to Development of Insulin-Producing Cells

Researchers have identified a gene that is required for the development of insulin-producing cells and other cell types in the pancreas. They found that mice lacking the gene (called Rfx6) failed to generate insulin-producing beta cells and most other normal cell types in the pancreatic islets. They also found that, in people, deficiency of the Rfx6 gene resulted in diabetes in newborns. The research was led by scientists at the University of California, San Francisco and McGill University in Montreal.

What this may mean for people with type 1 diabetes: This work reveals the importance of Rfx6 in the body's natural production of insulin-producing cells – and thus identifies a new target from which to develop potential treatments for type 1 diabetes. Further research on the gene may help scientists discover how to produce replacement beta cells; the gene might also have a role in the development of therapies to regenerate beta cells.

Stress Hormone Is Linked to Beta Cell Growth, Providing Potential New Therapeutic Target

A hormone responsible for the body's stress response has been linked to the function and growth of the insulin-producing beta cells. When beta cells were exposed to the hormone (called CRF) and to high levels of sugar, they produced and released insulin and began to grow faster. The study was led by JDRF-funded researchers at the Salk Institute for Biological Studies in California.

What this may mean for people with type 1 diabetes: The findings reinforce the potential of regeneration as a cure for diabetes and also provide insights for discovering new approaches to treat the disease.

Two New Partnerships in Regeneration Help Drive Towards a Cure Faster

JDRF has entered into two key collaborative agreements that will quicken the pace of progress toward cures and treatments for type 1 diabetes. The first – one of the largest and most comprehensive collaborations in JDRF's 40-year history – is with the Genomics Institute of the Novartis Research Foundation (GNF). It aims to create a pipeline of potential new regeneration drugs to test in clinical trials. The second is with the Johnson & Johnson Corporate Office of Science and Technology and its affiliates, and it aims to speed the development of drug targets and pathways that promote beta cell survival and function.

What this may mean for people with type 1 diabetes: The new partnerships will generate a string of potential new beta cell therapies – and further accelerate progress toward a cure.

To stay up-to-date on the latest JDRF-funded advances, please visit www.jdrf.org.