

Beta Cell Therapies are ways to restore the body's ability to make insulin. JDRF's Beta Cell Therapies research combines two overlapping therapeutic areas: regeneration (triggering the body to re-grow insulin-producing beta cells) and replacement (replacing the beta cells lost to type 1 diabetes). While these two therapeutic areas were once considered different paths to potential cures and treatments for type 1 diabetes, research has shown they often converge, with scientific findings in one area advancing the other. The combination of regeneration and replacement into Beta Cell Therapies joins the resources and strengths of each into a stronger, more collaborative, and more targeted union that will drive toward a cure faster.

JDRF's Beta Cell Therapies Research Goals

The overall goal of JDRF's Beta Cell Therapies research is to find ways to restore the body's ability to make insulin, either through the regeneration of insulin-producing beta cells (for patients at all stages of type 1 diabetes) or through the replacement of beta cells (for patients who have been living with the disease for some time).

Priority Program

Within Beta Cell Therapies, JDRF prioritizes regeneration because of its potential to restore beta cell function in the largest number of people with type 1 diabetes. Scientists working in this field are investigating ways to generate new beta cells from progenitor cells, promote beta cell growth and survival, and reprogram cells that do not normally produce insulin into cells that do.

A second research track focuses on finding better replacement therapies, through stem cell research and transplantation methods that will not require strong immunosuppressive drugs. The success of both research tracks will depend on scientists being able to stop the body's attack on new beta cells.

Specific Research Goals

JDRF has developed a set of specific goals for Beta Cell Therapies and the rest of our therapeutic areas. These goals are guiding every decision we make about where to direct our funds and energies to bring results as quickly as possible. For Beta Cell Therapies, our goals include:

- Identifying the cells that should be targeted by new drugs.
- Learning how the body expands beta cells in situations like pregnancy, growth, and obesity.
- Determining which biological processes are at work and should be targeted in developing new regeneration drugs.
- Exploring the use of stem cells and other precursor cells as sources of new beta cells.
- Identifying the cells that give rise to beta cells and determining their potential as a source of new beta cells.

- Determining whether beta cells from animals work in humans.
- Exploring whether encapsulating islets improves the success of islet transplantation.
- Identifying biomarkers—biological clues to gauge whether a treatment is working—to help speed the progress of research.

Beta Cell Therapies Facts

JDRFI Funding:	\$39 million (U.S.); 39 per cent of all FY09 funding
Potential Sources of Insulin-Producing Cells:	Stem cells, reprogrammed cells, cells from pigs and other animals
Human Clinical Trials:	10

What Will Your Support Mean?

We cannot cure type 1 diabetes without finding a way for people to begin producing their own insulin again. Your support of JDRF's Beta Cell Therapies research will help us follow the most promising paths to that goal.

Recent Research Progress

- Researchers discover why insulin-producing beta cells lose their ability to regenerate with age—and identify the proteins that may control this process.
- Scientists identify compounds that trigger beta cell replication.
- By driving the expression of a gene, researchers turn pancreas cells that normally do not make insulin into cells that do.
- Scientists identify a protein that regulates beta cell regeneration.
- Scientists show cells that become insulin-producing cells can survive, proliferate, and mature in a transplanted encapsulation device. ■