

Cure Therapeutics

Autoimmunity

A key part of JDRF's research is aimed at stopping or reversing the immune system response that causes diabetes: the attack on insulin-secreting cells in the pancreas. Research is focused on blocking the effect of the immune system cells that kill off the insulin-producing cells. You need to stop the immune attack, so that any therapies involving replacing or regenerating insulin-producing cells can work long-term.

Regeneration

Among the fastest-growing scientific areas JDRF supports is research aimed at regenerating insulin-producing cells in people who have diabetes (as opposed to transplanting cells from organ donors or other sources). This involves triggering the body to grow its own new insulin producing cells, either by copying existing ones – some are usually still active, even in people who have had diabetes for decades – or causing the pancreas to create new ones.

Replacement

An alternative to sparking the body into growing new insulin-producing cells is replacing cells killed off by diabetes with functioning ones from a donor – similar to a heart or kidney transplant. Beyond improving transplantation techniques, our research is focused on increasing the supply of cells that can be transplanted – from animals, like pigs, or by finding ways to change different types of cells, such as liver cells, or coaxing adult or embryonic stem cells into becoming insulin-producing cells.

Complications

Diabetes-related complications include eye disease, nerve damage, kidney disease, and heart disease and stroke. A significant part of JDRF's research is focused on understanding how diabetes causes complications, and developing drugs, treatments, and therapies to stop that process, or reverse the impact of the different types of individual complications.

Metabolic Control

Treatments that continually monitor the body's blood sugar levels, and automatically respond with the correct dose of insulin would significantly enhance metabolic control. JDRF research is focused on demonstrating that advanced monitoring tools might significantly improve the health of people with diabetes, and on developing technologies that link insulin pumps and continuous glucose monitors. Such a "closed loop" system would, in effect, be an artificial pancreas. Tighter control is key to reducing complications, and is critical in allowing regenerated insulin-producing cells to function normally.