JDRF IMPROVING LIVES. CURING TYPE 1 DIABETES.

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COOL Research News

Every day, JDRF leverages the expertise and innovation of distinguished researchers from across the globe to support research for life-changing treatments and ultimately a cure for type 1 diabetes (T1D). Our aim is to progressively reduce the burden of the disease on people's lives until we can achieve a world without T1D. Please enjoy reading about some of the ways that we are working tirelessly to make that happen.

Getting to the Root of T1D

The human immune system comprises complex biological structures and processes that protect the body against disease. In people with T1D, the immune system destroys insulin-producing beta cells in the pancreas. This autoimmune attack can be indicated by the presence of tiny molecules called islet autoantibodies. Now, a decade-long study conducted by JDRF-funded investigators has strengthened the link between autoantibodies and the risk of developing T1D and emphasized the importance of prediabetes research into possible preventions for the disease.

A global team of researchers in Colorado, Finland, and Germany followed more than 13,000 children from infancy up to age three to detect the presence of islet autoantibodies. The results showed nearly 70 percent of the young children studied who had two or more autoantibodies developed T1D within 10 years, and 84 percent of that group developed T1D in 15 years. The study also revealed that 14.5 percent of the children with a single islet autoantibody developed T1D within 10 years, and that the disease progressed faster in those who developed autoantibodies before the age of three. Additionally, the risk for children without autoantibodies was only 0.4 percent by age 15.

The results give scientists the first true estimate of when the onset of T1D may begin, and will help to better identify children who are at the highest risk for developing T1D. They also highlight the importance of prediabetes research for disease prevention and allow scientists to focus prevention efforts on groups who are most likely to become insulin dependent.

Working Toward Interspecies Islet Transplants

Transplanting islet cells or a pancreas from a deceased donor can help restore beta cell function and insulin production in people with T1D. But there are not enough donor pancreases to go around, and a patient can suffer serious complications while waiting for a donor. Additionally, transplantation carries a high risk of the body rejecting the donor tissue, meaning that transplant recipients must take potentially toxic drugs called immunosuppressives for the rest of their lives to keep the cells healthy and decrease the risk for infections or disease.

But JDRF-funded researchers at Northwestern University Feinberg School of Medicine have taken the first step toward animal-to-human islet transplantation by successfully transplanting insulin-producing islets from one species to another without requiring medication. The scientists modified the immune systems of mice to recognize rat islets as their own and not reject them. The mice were monitored for 300 days, during which 100 percent of the transplanted islets continued to produce insulin—the first time that an interspecies transplant of islet cells has been successful for an indefinite period of time without the use of immunosuppressive drugs. The goal is to be able to transplant pig islets into humans, since pig islets make insulin that can control blood-glucose levels in humans.

Although the researchers acknowledge that it is probably easier to get mice to accept tissue from rats than to get a human to accept islet cells from a pig, they stress that this is a first step toward interspecies islet transplants without the need for immunosuppressive medications.

To find out more about T1D research, or how to get involved with JDRF in your community, visit jdrf.org.