

JDRF has made exciting progress this year in our mission of accelerating life-changing breakthroughs to

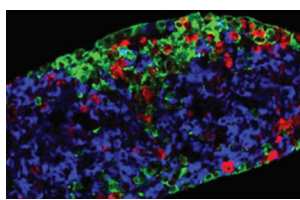
CURE | PREVENT | TREAT

type 1 diabetes (T1D) and its complications. This update will feature several prominent advances in T1D research made possible by JDRF's supporters.

CURE

Paving a pathway to a cure

JDRF's ultimate goal is to cure T1D. One pathway to get us there is to pursue research priorities that can improve treatment of T1D in the short term and mature over time into curative therapies. Strategies for islet cell replacement have this potential, and during FY16, JDRF supported clinical trials of three of these strategies, including ViaCyte's VC-01 device.



Early promise in ViaCyte trial

VC-01 features pancreatic precursor cells enclosed in a device to protect them from immune attack. In January 2016 ViaCyte reported that VC-01's precursor cells showed signs of developing into insulin-producing beta cells in one participant of the phase 1 safety trial. Although the observations are preliminary, they suggest the VC-01 device is working as designed.

Preclinical success for microencapsulation

JDRF-funded researchers Daniel Anderson, Ph.D., Robert Langer, Sc.D., and Douglas Melton, Ph.D., are collaborating on another strategy for beta cell replacement. Their strategy combines a novel encapsulation material with islet cells derived from stem cells in large quantities using a laboratory procedure. In February 2016, the researchers reported that the encapsulated cells began producing insulin immediately after being implanted in mice and maintained healthy blood-glucose levels for six months and that the encapsulation material was compatible with living tissue in large animal models. The results indicate that the encapsulation material and islet cells may be viable components of a beta cell replacement therapy. Once the beta cell replacement strategy is optimized for use in people, it could be tested in a future clinical trial.

PREVENT

A future without T1D

Another way to realize our vision of a world without T1D is ensuring people never get the disease in the first place. JDRF's work over more than 10 years has made prevention a real possibility for future generations.

Learning to stop progression

In October, JDRF and other leading diabetes organizations published a classification system describing the early stages of T1D development before symptoms appear. The system defines a window of opportunity during which we may be able to interrupt disease development and delay the onset of symptoms. This laid the groundwork for trials to detect T1D during early stages and to test different ways of stopping its progression.

Screening for the future

JDRF is funding the Fr1da project, in which 3- and 4-year-olds in Bavaria are screened for early-stage markers of T1D at well-child visits. Those who test positive for the markers can enroll in a study monitoring disease progression or a trial testing whether oral insulin can stop progression of T1D—which launched in November. These trials raise the exciting prospect of stopping T1D in its tracks and changing the future for those at risk of developing T1D.



TREAT

Developing next-generation tools

As we work to delay or prevent the onset of T1D, we must also work to improve life for the millions of people who have T1D today. For more than a decade, JDRF has championed the development of artificial pancreas (AP) systems to improve outcomes for people with T1D. Thanks to our efforts, FY16 saw at least 18 different AP systems under development by industry and academic groups, including a team at the University of Virginia (UVA). JDRF is also pursuing other strategies to ease the burden and improve health outcomes for people with T1D, such as glucose-responsive insulins (GRIs).



Artificial pancreas system with real-world results

JDRF funded a clinical trial this year which showed UVA's AP system provided better blood-glucose management than a regular insulin pump when used by participants in their everyday lives. The results help to prove that the AP system can make diabetes management safer, easier and more effective. Favorable results in two additional trials this year could lead to approval from the U.S. Food and Drug Administration to bring the device to market. The new trials are funded by the Special Diabetes Program, which was renewed last year thanks to the efforts of JDRF and our legions of volunteer advocates.



Insulin that reacts to the body's needs

GRIs are innovative insulins that would activate when blood-glucose levels rise and deactivate when they fall, preventing dangerous highs and lows. In FY16, JDRF partnered with pharmaceutical leader Sanofi to commit almost \$5 million toward developing four different approaches to GRIs. The partnership will speed the development of GRIs for the T1D community by uniting JDRF's scientific leadership with Sanofi's expertise in bringing novel insulins to market. Partnering with industry is part of our strategic plan to do the greatest good for the most people in the shortest amount of time.

ADVOCACY



Increasing access, improving outcomes

JDRF drives innovation by supporting research and by ensuring people will have access to new therapies as they are developed. In FY16 JDRF launched a health policy initiative with the Helmsley Charitable Trust and T1D Exchange to increase access to emerging therapies. Maximizing access to advanced therapies can improve health outcomes for those living with T1D and encourage continued innovation in developing next-generation therapies.

THESE AND OTHER ADVANCES TOWARD OUR MISSION
WOULD NOT BE POSSIBLE WITHOUT JDRF'S MANY SUPPORTERS.
THANK YOU FOR JOINING JDRF IN CREATING A WORLD WITHOUT T1D!

For more information on all of our research projects, please visit jdrf.org.

