JDRF Research
Top 10 Advances of FY2012

JDRF Cure Research
Halting the autoimmune process and restoring normal insulin production.

Targeted Immune Rebalancing Therapy Starts Clinical Study
A JDRF-supported study launched at the University of California at San Francisco is enrolling patients with recent onset T1D to test a therapy for rebalancing their immune system. A patient’s “T-reg” cells that regulate the immune system will be grown in the lab then re-infused to the patient. The hope is that these added T-reg will halt the destructive “killer” T-effector cells that attack beta cells. This milestone represents the first human test of such a T1D therapy. (Learn more at clinicaltrials.gov)

An Explosion of Newly Discovered Beta Cell Regeneration Pathways
Four JDRF-supported researchers (from Pittsburgh, Stanford, Zurich and Jerusalem) have identified unique and new pathways that control beta cell proliferation and might be activated with novel drug therapies. Some have even been turned on with prototype drugs in animal studies; others are at an earlier research stage. The concept of drugs to stimulate beta cell proliferation is becoming a reality. Drugs exist to promote cell proliferation in other diseases; hopefully one of these newly discovered pathways will yield a T1D drug for beta cell proliferation in the future. (Learn more at jdrf.org/betacell/regeneration)

Invention of Novel Oxygen-Producing Biomaterial for Beta Cell Encapsulation
Implanting encapsulated beta cells in a person with T1D could make them independent of external insulin use, but several hurdles exist. The key challenges are keeping the cells alive with oxygen and nutrients and protecting them from further immune attack. JDRF-supported researchers at the University of Miami invented a new type of biomaterial that produces oxygen to sustain beta cells immediately after implantation. This novel biomaterial should accelerate beta cell encapsulation progress by overcoming a key technical hurdle. (Learn more at jdrf.org/betacell/replacement)

Blood Test for Beta Cell Death Discovered
Current tests to detect and measure T1D are crude and cannot directly measure beta cell death. JDRF-supported researchers at Yale University discovered a new blood test that measures the release of beta cell DNA after they die. In mice, it could distinguish between mice with and without T1D. Better tests will allow earlier T1D detection and treatment by signaling the first signs of the disease process at the beta cell level. Such tests could also speed clinical studies of promising new therapies by allowing more rapid assessments of the effect of a new therapy on beta cell survival. (Learn more at jdrf.org/cureTID)

JDRF Treat Research
Developing new devices and therapies that optimize blood sugar control and treat or prevent T1D complications.

FDA Issues Draft AP System Guidance as a Result of JDRF-Led Effort
JDRF-led grassroots advocacy including support from professional clinical associations helped drive FDA to produce draft guidance for development of artificial pancreas systems. While JDRF provided FDA suggestions to improve the draft guidance, the expectations for clinical studies and approval of such systems are reasonable. JDRF is working closely with the FDA as the draft guidance is finalized. This guidance will speed JDRF’s APP clinical studies, especially outpatient studies, by informing researchers and companies of FDA’s recommendations. (Learn more at jdrf.org/app/plan)
JDRF APP Consortium Conducts the First Real World Test of an Artificial Pancreas System
Previously, all APP human testing had been done in a controlled hospital setting to be certain there were no significant safety concerns and because of the lack of regulatory guidance for such systems. The JDRF-supported study of a handheld device for controlling insulin delivery performed well in controlling non-mealtime insulin requirements. JDRF-supported real world testing in the US has recently begun, coordinated by the University of Virginia. Real world testing of AP systems moves them a big step closer to delivering them to patients. (Learn more at jdrf.org/app/plane)

JDRF Challenged the World to Invent Glucose Responsive Insulin Products for T1D
A glucose responsive insulin (GRI) would release insulin in the body only when needed and might be taken only once daily or once weekly. JDRF issued a $100,000 Challenge Prize to anyone who could develop a novel way to achieve a GRI product. JDRF will announce the Challenge Prize winners in summer 2012. JDRF is seeking creative solutions for novel T1D products from anywhere around the world; expanding the pool of talent focused on discovering and developing new T1D products. While still at an early stage, such a GRI product could transform T1D management. (Learn more at jdrf.org/gct)

Novel Markers of Kidney Disease Risk in T1D Discovered
Kidney disease is a serious complication of T1D and is very difficult to predict in people with T1D, since not everyone with T1D develops it. JDRF-supported researchers at the Joslin Diabetes Center in Boston have discovered proteins in the blood that are strongly associated with kidney disease risk in people with T1D. This finding could form the basis of a simple blood test for kidney disease risk in people with T1D. The earlier identification of someone with T1D at risk for kidney disease will allow earlier treatment and better management of this serious T1D complication. (Learn more at jdrf.org/complications/prevention)

JDRF Prevent Research
Preventing the autoimmune process from starting or stopping it before the onset of insulin dependence.

Focused a Novel Vaccine Technology on T1D Prevention
Targeted T1D vaccines are ones focused on the specific beta cell components to which the immune system mistakenly reacts. A vaccine focused on these beta cell components could stop the autoimmune process before a person becomes insulin dependent. JDRF is supporting this unique nanoparticle-based vaccine technology by partnering with Selecta (a Massachusetts based company) to ensure they focus their efforts on T1D, something not previously a priority for them. Vaccine research is one of the most promising approaches to prevent or halt the beta cell-specific autoimmunity in T1D. (Learn more at jdrf.org/prevention/strategy)

Strengthened the Link between Enteroviruses and T1D
Enteroviruses are small viruses often found in a person’s gut. Previous studies have linked them to T1D but the connection was not clear. This new JDRF-supported research in Finland has now shown that enteroviruses can become a persistent infection in the gut lining of people with T1D and showed they can cause related inflammation, potentially a trigger for the T1D autoimmune response. Development of a vaccine or anti-viral agents that target these enteroviruses may be a possible T1D prevention strategy. (Learn more at jdrf.org/prevention/strategy)

- Your Generous Support of JDRF Made These Important Advances Possible - Thank You!

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