The Diabetes Research Institute has made quantum leaps in the lab and these ground-breaking discoveries are here and now. By applying next-generation thinking, bridging research expertise across the globe and turning revolutionary ideas into actions, the DRI is Leading with Excellence toward a cure for diabetes.

About the Diabetes Research Institute: Solely focused on one goal: a cure.
Pioneering New Therapies to Restore Insulin Production

The Institute is an innovator in several research areas, however its principal focus is the biological replacement of natural insulin function to restore blood sugar control. DRI scientists have already shown that insulin independence can be achieved through cell replacement strategies. Expert teams continue to make strides in the two overarching research issues necessary for curing this disease:

1. Retraining the immune system – preventing the rejection of donor tissue and reversing the autoimmune attack which caused the onset of diabetes.

2. Increasing the supply of insulin-producing cells – identifying, developing and/or regenerating a limitless supply of cells to sense blood glucose levels and produce insulin.

The Hub of a Global Research Alliance
The DRI has an impressive track record of scientific collaboration and its most far-reaching initiative to date is the Diabetes Research Institute Federation. Researchers from more than 20 medical centers from all corners of the world have agreed to form a one-of-a-kind alliance. This international network of collaborators share knowledge, pool expertise in specific research areas, and apply a diverse set of skills to the eradication of diabetes. The DRI leads this expanding effort with an underlying belief that the best way to make transformative discoveries – in the shortest amount of time – is to work together toward a cure.

The Best Work, The Best People, The Shortest Path
The Institute’s open-door philosophy provides opportunities for scientists and biomedical companies around the world to develop and quickly test their most promising findings. Much of this work begins in the DRI’s Stern Fast Track Center for Testing, where investigators can access all three phases of research – basic (in the lab), pre-clinical (study models), and clinical (patient studies) – at the Institute and through its collaborating centers. This translational approach enables researchers to take potential new therapies begun in the lab and further develop these techniques to benefit those with diabetes.

International Recognition
For more than 35 consecutive years, DRI scientists have been awarded competitive federal and state grants in the field of diabetes. The resulting discoveries have been published extensively in peer-reviewed journals and many of the DRI’s innovations are in current use at diabetes centers worldwide. As leaders in their respective fields, the Institute’s faculty serves on numerous national and international committees and provides leadership on many scientific review panels and associations.

The Strength of Private Funding
While competitive research grants are the mainstay of world-class research institutes, the Diabetes Research Institute Foundation provides the DRI with critical seed funding to gather data that is often a prerequisite for larger grants. This funding stream is at the heart of DRI’s ability to innovate and make quantum leaps in the race for a cure. Supported by private philanthropy, the DRI Foundation also fills the gaps in many stages of the research process for which there is little federal funding, or for areas in which federal funding falls short of actual need. Driven by its core mission, the DRI Foundation’s support also ensures the body of work conducted at the DRI remains cure-focused and will ultimately benefit those with diabetes.

A Community Resource
The DRI is a designated Center of Excellence at the University of Miami Miller School of Medicine, providing informative education and training programs for many types of health care professionals and industry representatives. For patients with diabetes and their families, the DRI’s Kowal Diabetes Treatment Center offers the highest standards of health care delivery, ongoing management and education support, and numerous clinical research possibilities.

The Best Hope for a Cure
The Diabetes Research Institute was created for one reason – to cure diabetes – which is and will continue to be its singular focus until that goal is reached. With an aggressive approach to curing those living with diabetes, along with its unique spirit of collaboration and notable accomplishments, the DRI is leading the international effort to eradicate this disease. For the millions of people affected by diabetes, the DRI is the best hope for a cure.
The Mission of the Diabetes Research Institute:
To develop and rapidly apply the most promising research to treat and cure those now living with diabetes.

Goals

• To foster a dynamic multidisciplinary research team comprised of basic and clinical scientists that conduct innovative diabetes research.

• To facilitate the translation of new research findings into novel therapies for patients with diabetes as quickly as possible.

• To improve clinical care and enhance the quality of life for all patients with diabetes through professional training and education programs.

• To expand collaborative alliances with other leading centers of research, thus creating a global intellectual environment, which streamlines research efforts worldwide and furthers our mission to cure diabetes.

• To establish corporate, philanthropic and academic partnerships to share in the costs of research and development, thus accelerating the testing of new approaches and developments to cure diabetes.
Increasingly, we at the DRI find ourselves reaching out to like-minded scientists across the globe who are eager to share a curious finding with us, to senior investigators who want to partner with us in a fast-tracked project, and to newly-formed teams abroad who seek and would benefit from our expertise in transplantation. The end game is the same for all of us in this field, the cure of a formidable disease that affects us all. What’s different today, however, is that limited resources are becoming even more scarce as typical sources of funding, like NIH grants, become more rare and difficult to secure for type 1 diabetes cure-focused research for example. The pace of communication is also much quicker, as findings in one lab can have immediate impact on work being carried out in another country, and no longer need to wait for publication in a paper journal.

This brave new world we live in has made global outreach and collaborative research that much more vital to progress in the field of diabetes. Thus, we at the DRI have moved quickly to adapt and make the changes work for us.

With the worldwide network of centers comprising the DRI Federation, we have altered the way we do business, and have revised our model of translational research so that experimental agility and harmonization is at the forefront of all our work:

• We have committed to leverage every dollar of support we receive and make it the most intelligently spent dollar possible. This means we conduct clinical trials with partners that have more streamlined regulatory processes, so that trials are conducted more expeditiously and results achieved with shorter timelines.

• We actively seek partners who bring unique talents to the table, regardless of where their base institutions may reside. Thus, our collaborators on a given project can be from the West Coast, the Pacific Rim, and the Netherlands – each contributing simultaneously to answer a critical question that is perhaps unanswerable unless we all work together.

• We reaffirm on a daily basis our open door philosophy of sharing with colleagues instead of competing with them, because that way it is the patient with diabetes that ultimately wins.

In short, we at the DRI make our position as ‘the best hope for a cure’ a reality – as no other research center I know of does.

Please look through this compendium of work, and continue to support the work we do, together with our global partners. I believe it is only through collaboration and partnership that we can unlock the cure to diabetes in the shortest, most efficient way possible.

Warmest regards,

Camillo Ricordi, M.D.
Stacy Joy Goodman Professor of Surgery
Distinguished Professor of Medicine
Professor of Biomedical Engineering, Microbiology & Immunology
Director, Diabetes Research Institute and Cell Transplant Center
University of Miami
Mesenchymal stem cells (MSCs), which are found in many tissues of the body, have a number of beneficial properties. Co-transplanting MSCs with islets can help prolong their survival and function.

THE CHALLENGE OF THE IMMUNE SYSTEM – THE CELLS OF OUR OWN BODY MAY HOLD THE KEY

In type 1 diabetes, the immune system poses significant challenges. First you have the autoimmune attack that caused the initial onset of diabetes. This occurs when the body’s own immune system mistakenly destroys its insulin-producing beta cells in the pancreas. Halting the autoimmune attack on these cells and restoring natural insulin production continues to be an area of intense focus at the Diabetes Research Institute and several strategies are underway to address this issue.

Our scientists have been working on ways to give patients new insulin-producing cells through a procedure known as islet cell transplantation, which has shown great promise in ongoing clinical trials. DRI researchers have already shown that transplanting donor islet cells into patients with diabetes can restore natural insulin production. Some of our study patients have been insulin-free for more than a decade.

Yet again, the immune system is at play because the body’s natural response is to reject these “foreign” cells. To prevent the destruction of the donor islets, transplant recipients must take powerful immunosuppressive (anti-rejection) drugs for life. These drugs often cause unwanted side effects, including damage to the islets themselves. They also shut down the patient’s entire immune system, leaving him/her susceptible to other viruses and infections. So, reversing diabetes requires a two-pronged strategy: to halt autoimmunity and to prevent rejection of newly-transplanted cells. In both cases, the body must be re-educated to tolerate insulin-producing cells. The DRI is studying a number of ways to achieve tolerance and safely block the immune attack with a particular focus on using cells in the body that offer natural defenses. This past year, our researchers have pursued a number of promising strategies and were recognized for their ground-breaking discoveries in peer-reviewed scientific journals and by the National Institutes of Health.

Advancing Transplant Immunology with Mesenchymal Stem Cells (MSCs)

Mesenchymal stem cells (MSCs) are found throughout the body and are considered “adult” stem cells because they are already committed to become tissues such as cartilage, bone and fat, among others. Several years ago, the DRI’s Dr. Norma Sue Kenyon, Martin Kleiman professor of surgery, medicine, microbiology and immunology and biomedical engineering and DRI senior scientist, also discovered that MSCs obtained from the bone marrow have other unique properties that enhance transplant acceptance, including the ability to limit inflammation, stimulate blood vessel growth (increase vascularization), prevent rejection and promote long-term function of islets.
In a study that was published in the journal *Diabetes*, Dr. Kenyon, together with collaborator Dr. Amelia Bartholomew from the University of Illinois/Chicago, demonstrated that when MSCs were transplanted alongside islets into the liver, recipients had double the function or more as compared to the recipients of islets alone. Furthermore, when the team observed a rejection episode, they administered additional MSCs, which resulted not only in reversed rejection but in enhanced function of the transplanted insulin-producing cells.

**Furthering MSC Studies with a Major National Institutes of Health Grant**

The data from these preliminary MSC studies, which were funded by the Diabetes Research Institute Foundation, were so significant that Drs. Kenyon and Bartholomew and their collaborators were awarded a nearly $10 million five-year, multi-center grant from the National Institutes of Health to further their work with mesenchymal stem cells in the cellular and kidney transplant settings.

In this next series of studies, the collaborative team will seek to identify the optimal source of mesenchymal stem cells to enhance engraftment – whether these cells should come from the recipient or from a different person. Thereafter, they will seek to verify that MSCs can consistently reverse rejection and, if so, then develop an MSC-based anti-rejection therapy; 2) to identify and characterize the factors required for the optimal type of MSCs, since all of these cells are not identical; and finally 3) to complete islet and kidney pilot studies for inclusion in FDA Investigation New Drug (IND) submissions.

**Targeting Inflammation with Antioxidants**

For years we’ve been reading about the benefits of antioxidants in helping to ward off the effects of free radicals that can damage cells and contribute to heart disease, cancer and other conditions. Now, DRI researchers have found that antioxidants, like MSCs, can help to prevent the inflammatory reaction often associated with transplanted islets. Ongoing studies conducted by the team led by Dr. Antonello Pileggi, director of the Preclinical Cell Processing and Translational Models Program at the DRI, demonstrated that antioxidants can be used to maximize the long-term acceptance of transplanted islets and the establishment of immune tolerance. The studies demonstrate the critical role of targeting inflammation pathways at the time of islet transplantation to enhance islet engraftment and long-term function.

**Learning from Cancer**

DRI scientists are taking a page from new findings in cancer research and testing how naturally-occurring cells may be used to protect transplanted insulin-producing cells. Cancerous tumors are capable of escaping the immune system by surrounding themselves with a subset of bone marrow cells called myeloid-derived suppressor cells (MDSCs). These naturally-occurring cells play a major role in shielding the tumor from an immune attack by inducing a tolerogenic response, meaning the body does not recognize them as foreign or as a dangerous threat.

**Observing Cell Attack Through the Eye in Real Time**

A 2011 DRI study showed that the anterior chamber of the eye provides researchers with a unique platform to gain insights into the mechanisms involved in the cellular progression of autoimmunity. The research builds on our groundbreaking work with the “living window” – a revolutionary technique that allows scientists to view, in real time through the cornea of a mouse, how transplanted insulin-producing cells function when they are inside a living organism. While researchers set out to use the living window to study islet cell biology and to monitor transplanted tissue, the technology is now allowing them to study the destruction of islet cells due to the body’s autoimmune attack. DRI scientists were among a group of collaborators that published the results of the pioneering study in the Proceedings of the National Academy of Science (PNAS) in 2011.
DRI researchers want to use these myeloid-derived suppressor cells for the better — to protect transplanted islets — and have found increasing evidence that MDSCs could represent an important tool for the treatment of autoimmune diseases and to prevent transplant rejection.

In 2011, the DRI’s immunobiology team, led by Dr. Luca Inverardi, research professor of medicine, microbiology and immunology and deputy director of translational research, was able to mobilize and harvest large numbers of MDSCs from bone marrow and expand them in great quantities using a cocktail of drugs that is already FDA-approved for other medical uses. This provides researchers the opportunity to quickly translate this therapy into clinical trials if the use of MDSCs to prevent transplant rejection.

In related research, the DRI’s Dr. Alice Tomei, research assistant professor of surgery and cell transplantation, and her team studied additional characteristics of cancerous tumors, and specifically, the role of a protein called CCL21 in evading immune system attack. Similar to MDSCs, CCL21 production has been shown to induce local immunosuppression by suppressing the activation of the killer T cells. The preliminary findings indicate that CCL21 may show promise in diabetes research by recruiting MDSCs to the site of CCL21-expressing grafts. The goal is to exploit the way tumor cells successfully evade immune recognition, which may be a safer alternative than the current immunosuppressive drugs used to promote islet survival after a transplant.

In another important advancement, the team showed that MDSCs can also be harvested from cord blood, which our researchers are already using to address the cell supply issue. The ability to utilize cord blood, which is in plentiful supply, as immune-regulatory cells represents an efficient and exciting new research pathway. The important role that MDSCs may play in modulating the immune system was also demonstrated in a separate study involving the use of another FDA-approved drug called Filgrastim (G-CSF), in the study, Filgrastim, which is used to stimulate the growth of white blood cells, induced the growth of MDSCs and promoted longer islet transplant survival. The researchers will now further investigate its potential to improve islet transplantation outcomes.

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DRI researchers have also focused their attention on another type of immune system cell called Regulatory T-cells or T-regs. This subset of immune cells actively prevents the immune system from reacting against the body’s own tissues and cells. They work with other protective factors to ensure that infections and foreign invaders are destroyed, but that “self” is not. It is a delicate balance. A loss of T-regs can cause several autoimmune diseases, including type 1 diabetes.

Researchers believe that correcting this imbalance by replacing T-reg cells may be beneficial for promoting the acceptance of transplanted islet cells without the use of strong, immunosuppressive drugs and, potentially, for reversing autoimmunity.

In related studies, the research team is also investigating a natural substance known as IL-2 that is released by a type of white blood cell in the immune system. IL-2 is required for T-reg function and survival, as well as other immune cell types. Researchers have shown that administering low doses of IL-2 reverses type 1 diabetes in experimental models by improving T-reg function. Therefore, IL-2 itself could be seen as a potential drug for controlling autoimmunity. IL-2 is already being used in clinical trials, but at much higher doses for cancer therapy.

Armed with this information and bolstered by a grant from the Peacock Foundation, Inc., Drs. Alberto Pugliese, professor of medicine, immunology and microbiology and head of the DRI’s Immunogenetics Program, and Thomas Malek, professor and vice-chair of microbiology and immunology, and their teams have launched a new research initiative that focuses on identifying novel T-reg/IL-2 therapies in patients with type 1 diabetes. The goal is to identify ways that IL-2 can selectively promote and/or restore immune system function and halt the autoimmune attack by positively affecting T-reg function.

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THE CELL SUPPLY CHALLENGE – CREATING MORE INSULIN-PRODUCING CELLS

In addition to addressing the issues related to the immune system, another major challenge we face is the short supply of insulin-producing tissue for transplant. At the DRI, researchers are pursuing several strategies to create an unlimited supply of insulin-producing cells and/or to regenerate the islets that have been destroyed by the immune system. To create a new supply of cells, we have focused our attention on stem cell research, a field in which many promising developments have been made. In fact, there is no other discipline in the history of medicine that has been advancing as fast as stem cell research. At the DRI, which was the first center to bring embryonic stem cell research technology to the University of Miami, we continue to make steady progress. In 2011, our researchers reported on a number of significant developments with both embryonic and adult stem cells.

Improving Safety in Stem Cell Research

Embryonic stem cells are considered the gold standard of all stem cells. They proliferate at a remarkable rate and have the potential to develop into any cell type within the body. These beneficial characteristics, however, also pose significant risks. When left unchecked, even a single, wildly-dividing embryonic stem cell can cause tumors to form. We are working to eliminate that risk by developing safer, more efficient protocols for the use of these cells.

Led by Dr. Juan Dominguez-Bendala, director of stem cell development for translational research, our stem cell development team is genetically engineering embryonic stem cells so that they contain “suicide genes” that will kill cells that keep dividing or don’t produce insulin—a kind of double-fail-safe mechanism. Over the past year, the team has been focusing on building this very complex sequence of genes containing these instructions and is now ready to begin in vitro work leading to pre-clinical testing.

Testing Adult Stem Cells

Our scientists are investigating a variety of adult stem cell sources to induce their differentiation into beta cells. Of particular interest are stem cells obtained from cord blood, which are plentiful and pose no ethical barriers. DRI researchers have identified and isolated a unique population of these cord blood cells, known as mesenchymal stem cells (MSCs). As mentioned before, a mesenchymal stem cell is a type of cell that can become cartilage, bone, fat, blood vessels and other cell types. In this section on cell supply, we report on how our researchers are focusing on coaxing them to behave similar to beta cells. This past year, the team, including Drs. Luca Inverardi and Juan Dominguez-Bendala, has been successful in consistently harvesting these precursor cells, or stem cells, from the cord blood, expanding them and pushing them down a path to sense glucose and secrete insulin. These promising findings were reported in the journal Cell Transplantation. The next step will be to expand them in numbers that are sufficient for clinical translation and to ensure that these newly-derived beta cells are able to safely function like normal beta cells. DRI researchers are also looking at other possible adult stem cell sources that may be turned into insulin-producing cells, including the extra-hepatic biliary tree (in the liver), which is a relatively new development, and adipose (fat) cells. In preliminary studies conducted with our collaborators in Milan, Italy, a portion of adipose-derived cells were transformed into insulin-producing cells. Among the many possible sources, the team will identify the most promising option for adult stem cell focus and ongoing study.

Transforming Other Cell Types into Insulin-Producing Cells

Another avenue we’re pursuing to alleviate the shortage of insulin-producing cells is a process called transdifferentiation. Rather than educating a stem cell from its earliest stages of development, transdifferentiation—or cell reprogramming—can potentially offer a “short cut” by enabling a more mature cell type to be transformed directly into a beta cell.

To accomplish this, our stem cell development and molecular biology teams have been focusing on the acinar tissue of the pancreas. This "exocrine" or non-islet tissue produces digestive enzymes to process food and makes up almost 98 percent of the organ. It is typically discarded after an islet isolation procedure. Since the DRI is a leading islet isolation facility, we have a plentiful supply of acinar tissue.

This past fall, DRI researchers conducted preliminary experiments on the transdifferentiation of human acinar tissue resulting in a detectable increase in insulin production from these newly-reprogrammed cells. Previously, the teams had been testing a number of different proteins to try to reprogram these cells. In this latest study, led by Drs. Juan Dominguez-Bendala and Ricardo Pastori, research associate professor of medicine, immunology and microbiology and director of the DRI’s molecular biology laboratory, and published in Public Library of Science One, the team used a slightly modified protein known as TAT-MafA. This particular protein was chosen because previous studies showed its potential at enhancing beta cell development. When delivered into the embryos of experimental models, the protein caused a faster maturation of beta cells. The pancreas of the study models also had twice as much insulin as the untreated control models, their islets were bigger, better formed, and, overall, exhibited traits of better functioning islets.
Results of a preliminary study conducted in 2011 for years, recently-discovered technologies make now testing the order, timing and duration of the compared to previous approaches. Our scientists are signals to achieve maximum efficiency. While this approach has been theoretically feasible own cell transformation is to instruct cells to make their own proteins. We’re using synthetic versions of molecules called "mesenger RNAs" to relay the developmental signals necessary for that process. While this approach has been theoretically feasible for years, recently-discovered technologies make it practical.

Results of a preliminary study conducted in 2011 are promising. By using synthetic messenger RNAs, more cells are receiving the developmental signals compared to previous approaches. Our scientists are now testing the order, timing and duration of the signals to achieve maximum efficiency.

Exploring the Natural Re-growth of Insulin-Producing Cells

One other strategy to address the issue of supply is to induce islet regeneration—the natural re-growth of insulin-producing cells. We’re exploring this strategy in partnership with DRI Federation partner, Dr. Antonio Cuesta-Muñoz, of the Carlos Haya Hospital in Málaga, Spain, a leading worldwide expert in glucokinase (GK), a molecule that is considered the “glucose sensor” of the beta cell. This enzyme instructs the beta cell to secrete more or less insulin according to the concentration of sugar sensed in the blood. Inactivating mutations of the enzyme cause diabetes, whereas activating mutations result in the opposite effect, i.e., hypoglycemia.

One of the patients examined by Dr. Cuesta was a girl with one of the latter GK mutations. She experienced extreme and continuous hypoglycemia requiring the surgical removal of approximately 98 percent of her pancreas to stop the dangerous low blood sugars. Amazingly, several years after this drastic operation, the patient leads a normal life with just around 20,000 islets (as opposed to the normal 1 million). Biopsies of her “superislets” reveal that her beta cells are not only larger and more active than typical beta cells, but also replicate safely. These findings, published in the New England Journal of Medicine, provide us with a potential strategy to induce the natural re-growth of insulin-producing cells. In 2011, we began a partnership with Dr. Cuesta to further explore these findings as part of the Diabetes Research Institute Federation, a global alliance of research centers focused on curing diabetes.

Since MafA is an essential molecule to drive the process of transdifferentiation, this study represents a significant step toward reprogramming acinar tissue into insulin-producing cells for transplantation. One other approach to induce the process of stem cell transformation is to instruct cells to make their own proteins. We’re using synthetic versions of molecules called "mesenger RNAs" to relay the developmental signals necessary for that process. While this approach has been theoretically feasible for years, recently-discovered technologies make it practical.

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While these study results are most encouraging, several challenges must be overcome before we can offer this therapy to millions of children and adults with diabetes. In addition to the aforementioned issues of immune tolerance and cell supply, researchers are investigating an optimal site within the body to house the transplanted cells—another key element towards discovering a universal cure.

Although the liver has traditionally been the site of implantation, we’ve discovered that it is likely not the most ideal site for the transplanted cells. It is problematic for a variety of reasons. Upon infusion through the portal vein, a major vein that leads to the liver, islets are confronted with a variety of factors that cause inflammation which damages a large percentage of the fragile cells. Inflammation causes a stronger response by the immune system to “attack the problem,” much like what occurs when you get a splinter in your finger. Furthermore, when infused, the islets tend to clump together, preventing oxygen from reaching all the cells. Finally, the liver metabolizes the immunosuppressive drugs used to prevent rejection, which exposes the transplanted cells to the highest levels of these powerful drugs.

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But an alternative transplant site must do more than just serve as a new home for the insulin-producing cells. Prior to their destruction by the immune system, islets are very happy inside the pancreas, where they are surrounded by supporting tissue and other pancreatic cells. Additionally, there they receive an abundance of critical oxygen and other blood nutrients that are required to perform all the functions necessary to normalize blood sugar levels—both the highs and the lows. Considering the many needs of islets, the alternative site must provide the appropriate physical support for housing the new insulin-producing cells, an ability to deliver essential oxygen and nutrients, and finally, a means of protecting the cells from immune attack.

Here’s where tissue engineering comes in. At the DRI, researchers are creating bio-engineered transplant sites that can provide the physical support necessary to house the islets—but that is just one piece of the puzzle. Our ultimate goal is to develop a “mini organ” that can mimic the native pancreas and be enhanced with oxygen, nutrients, nerves and blood vessel growth factors and other agents to protect the cells and promote their long-term survival.
The effort is being led by the DRI’s tissue engineering team, which is working together with the Institute’s many other research teams to bridge the areas necessary to attack each challenge.

The DRI’s unique multidisciplinary structure, together with its worldwide network of collaborators through the DRI Federation, is what makes a project of this magnitude and significance possible. Over the last year, the DRI has taken a number of steps toward the realization of a “mini organ,” testing various bio-engineered devices together with immune agents and other enhancements.

Biohybrid Scaffolds – the framework for the “mini organ”

Dr. Cherie Stabler, assistant professor of biomedical engineering and surgery and director of tissue engineering, and her team have developed a bio-engineered scaffold to serve as the platform for building a “mini organ.” These scaffolds, developed at the DRI, provide a three-dimensional framework to house and protect insulin-producing cells. Like the spacing in the native pancreas, the scaffolds help to prevent islets from clumping together, allowing oxygen and other nutrients to efficiently reach each cell. In 2011, the team saw promising results using the scaffolds in pre-clinical models, achieving insulin independence for extended periods of time. Also last year, we explored using scaffolds to deliver beneficial cells or agents to further increase the viability of transplanted islets. One strategy involved incorporating an oxygen-generating compound into the scaffolds. As mentioned above, oxygen is vital to islet health; while insulin-producing islets make up only one to two percent of the entire pancreas where they reside, they use almost 25 percent of the oxygen that flows through the organ. In one pre-clinical study, an oxygen-binding compound incorporated into a scaffold did improve the viability of islets and glycemic control in recipients. A second strategy involves co-transplanting into the scaffolds insulin-producing cells and mesenchymal stem cells (MSCs), which have shown the ability to minimize inflammation that enhances acceptance and prolongs the health and function of transplanted insulin-producing cells. These studies are currently underway in pre-clinical models.

Moving Toward Clinical Trials

DRI researchers began pre-clinical testing of the sponge-like scaffolds to implant insulin-producing islets in sites other than the liver. The plan is to optimize the scaffolds and conduct clinical pilot studies. During different phases of this project, DRI scientists will test the long-term viability of the materials and the effects of co-transplanting “helper” cells alongside the islets into the scaffolds. These approaches include oxygen-binding compounds and other agents, the potential of low-dose local drug delivery and mesenchymal stem cells (MSCs) as described above.

Improving Encapsulation by “Shrink-Wrapping” Cells

Further means to shield islets from immune attack may be achieved by encapsulating the cells in protective coatings. DRI researchers are developing and testing a number of ways to coat transplanted insulin-producing cells. In one method, our scientists devised a means to “shrink-wrap” cells with a protective layer that literally conforms to the size and shape of each cell. The conformal coating makes it easier for nutrients and oxygen to reach the cell, and for insulin to be released without the delay typical of previous encapsulation methods. The results of the conformal coating study, led by Drs. Alice Tomei and Chris Fraker, research assistant professor of surgery and cell transplantation, were reported at 2011 Cell Transplant Society-International Xenotransplantation Association combined conference. The team is currently testing materials to identify the optimal coating.

[diabetes research institute foundation] 18
The DRI’s Dr. Rodolfo Alejandro, professor of medicine and director of clinical cell transplantation (seated, center) and the clinical cell transplant team.

Clinical Study Update

A clinical study shows that exenatide, a medication approved for the treatment of type 2 diabetes, had a positive impact on the survival of transplanted islets. In the study, transplant recipients were treated with exenatide over four years. According to DRI researchers, the use of exenatide prolongs islet function in islet transplant recipients although in many cases, the side effects made it difficult to tolerate the drug.

In another study, the DRI’s Dr. Rodolfo Alejandro and the clinical cell transplant team together with collaborators Dr. Bernhard Herling and his team at the University of Minnesota have shown that long-term insulin independence can be achieved in islet transplant patients who receive potent immunosuppression during the pre-transplant phase. The patients who received the new immunosuppressive regimen were twice as likely to remain insulin free for more than five years as compared to patients receiving the previously-tested drug levels. Insulin independence rates in the recipients approach those seen in pancreas transplants. The results of the study, which were published in the Journal of Transplantation, suggest that this drug regimen may benefit long-term outcomes through improved engraftment of a greater number of islets – less islets die off during initial implantation – and minimized recurrent autoimmunity.

TrialNet Update: Results Released for Two Drug Studies Designed to Slow Progression of Type 1 Diabetes

The results of two diabetes drug studies, including one that shows promise for stopping the immune system’s attack on insulin-producing cells in people newly diagnosed with type 1 diabetes, were presented at the American Diabetes Association’s Scientific Sessions in San Diego. They were simultaneously published online in the British medical journal The Lancet. The studies were conducted by the National Institutes of Health’s international network of researchers. Type 1 Diabetes TrialNet Study Group, which is housed at the DRI, under the direction of Dr. Jay Skyler, TrialNet national chairman. To learn more about TrialNet, visit DiabetesTrialNet.org.

Collaboration, innovation, integration and evaluation continue to be the driving force of the Diabetes Education, Nutrition and Exercise Service at the DRI’s Eleanor and Joseph Kosow Diabetes Treatment Center. The past 18 months has seen exciting expansion and coordination of education services, especially in the areas of nutrition and exercise, to meet the growing health and lifestyle needs of our diverse patient population. We continue to strive for excellence and optimal quality of patient education services, as evidenced by our certification as an American Diabetes Association’s Education Recognized Program (ADAERP).

We are proud of our accomplishments over the past 18 months but we possess a greater excitement about our plans for further service expansion over the next 18 months. Looking back:

• Increase in referral sources, now reaching 70 internal DRI and external community referrers. Implementation of the University’s electronic medical record, UChart, has facilitated timely electronic referrals, coordination of education appointments and enhanced awareness and communication of education services provided to our patient population.

• Further development of our Patient Education Service Electronic Data Management System (EDMS) has provided the ability to capture and now retrieve automated reports regarding essential demographic, clinical, education outcomes, department productivity and billings of all patients now attending our Service. With over 6,000 visits captured, the EDMS is an essential tool in both review of existing services and establishing direction of internal processes and future provision of services. An abstract on the EDMS will be published in the 2012 American Diabetes Association National Conference. A key objective now is to make the EDMS available to other Diabetes Education Services.

• Patient Education Service team expansion has enabled the development of new programs and services, especially in the essential area of nutrition and exercise. Patients now have access to comprehensive nutrition classes in English and Spanish, as well as group exercise classes at the University’s state-of-the-art Wellness Center (Gymnasium). In addition to our 14 monthly education classes, we continue to conduct four times annually, our pinnacle five-day intensive insulin management program, Mastering Your Diabetes (MYD). Translated and implemented in Italy (Milan and Palermo) in 2010, MYD now has plans underway for webinar based components to provide greater access to this unique diabetes self-management program.

• Increased collaboration with the DRIF has augmented both disease and Service awareness through newspaper, web, journal, seminar presentation and television opportunities.

Looking forward, the Patient Education Service has plans to develop and implement:

• A multi-disciplinary Transition Program, to assist children and parents in transition from pediatric to adult based diabetes management and care

• A multi-disciplinary weight management program

• A Type 1 diabetes Elite Athlete Program, in collaboration with our endocrinologists and the University’s Department of Exercise Physiology (upon employment of an exercise physiologist)

• On-site and on-line general and specialized diabetes training programs for health care professionals involved in the care of people living with diabetes. This will also include collaboratives with dietetic, nursing and medical training programs to provide clinical rotations through the Education Service.

• Enhancement of the Education section of the DRI website to provide interactive education opportunities

The Patient Education Service and its team members, while proud of our past achievements, are excited about the direction we are taking to further enhance the Service we are providing to our referrers and people living with diabetes, to both optimize healthcare delivery and health outcomes.
Faculty

Dr. Camillo Ricordi
Stacy Jay Goodman Professor of Surgery
Distinguished Professor of Medicine
Director, Diabetes Research Institute and Cell Transplant Center

Dr. Rodolfo Alejandro
Professor of Medicine
Director, Clinical Cell Transplant Center (CCTP)
Associate Director of Clinical Research
Associate Director, Cell Transplant Center

Dr. Allison Bayer
Research Assistant Professor of Microbiology and Immunology

Dr. Per-Olof Berggren
Mary Lou Hold Visiting Scientist
Adjunct Professor of Surgery
Head of Cell Biology and Signal Transduction
Professor and Head, Experimental Endocrinology at the Karolinska Institute in Sweden

Dr. Dora Berman-Weinberg
Research Associate Professor of Surgery

Dr. Peter Buchwald
Assistant Professor
Department of Molecular and Cellular Pharmacology
Director, Drug Discovery Program and Fast Track Program

Dr. Juan Dominguez-Bendala
Research Associate Professor of Surgery
Director, Stem Cell Development for Translational Research

Dr. Alessia Fornoni
Assistant Professor of Clinical Medicine,
Division of Nephrology and Hypertension

Dr. Chris Frakes
Research Assistant Professor of Surgery and Cell Transplantation

Dr. Jeffrey Hubbell
Adjunct Professor of Biomedical Engineering
Director, Integrative Biosciences Institute
Institute for Chemical Sciences and Engineering at Ecole Polytechnique Fédérale de Lausanne, Switzerland

Dr. Luca Inverardi
Research Professor of Medicine, Microbiology and Immunology
Director, Immunology of Islet Transplantation
Deputy Director for Translational Research

Dr. Norma S. Kenyon
Martin Kleiman Professor of Surgery, Medicine, Microbiology and Immunology and Biomedical Engineering
Director, Wallace H. Coulter Center for Translational Research
Chief Innovation Officer, University of Miami

Dr. Livio Luzi
Adjunct Professor of Physiology
Director, Amino Acid and Stable Isotopes Laboratory, Nutrition and Metabolism Program
University of Milan, San Raffaele Scientific Institute, Milan, Italy

Dr. Thomas Malek
Professor and Vice-Chair of Microbiology and Immunology

Dr. Jennifer Marks
Professor of Medicine
Division of Endocrinology, Diabetes and Metabolism

Dr. Armando Mendez
Research Associate Professor of Medicine
Division of Endocrinology, Diabetes and Metabolism

Dr. Luigi Meneghini
Associate Professor of Clinical Medicine
Director, Eleanor and Joseph Kosow Diabetes Treatment Center

Dr. Daniel H. Mintz
Scientific Director Emeritus
Professor of Medicine

Dr. Bresta Miranda-Palma
Assistant Professor of Medicine
Division of Endocrinology, Diabetes, and Metabolism

Dr. Robin Nemery
Adjunct Professor of Pediatrics
Division Head of Pediatric Endocrinology at Joe DiMaggio Children’s Hospital

Dr. Ricardo Pastori
Research Professor of Medicine, Immunology, and Microbiology
Director, Molecular Biology Laboratory

Dr. Maria del Pilar Solano
Assistant Professor of Medicine

Dr. Antonello Pileggi
Research Associate Professor of Surgery
Director, Pre-Clinical Cell Processing and Translational Models

Dr. Alberto Pugliese
Research Professor of Medicine, Immunology and Microbiology
Director, Immunogenetics Program

Dr. Jay Skyler
Professor of Medicine, Pediatrics and Psychology
Division of Endocrinology, Diabetes and Metabolism
Deputy Director for Clinical Research and Academic Programs,
Diabetes, Obesity, and Vascular Disease (DOVAD) Chair

Dr. Cherie Stabler
Assistant Professor of Biomedical Engineering
Director, Tissue Engineering Laboratory

Dr. Alice Tomei
Research Assistant Professor of Surgery and Cell Transplantation

Dr. Andreas Tzakis
Professor and Director, Miami Transplant Institute
Director of Microsurgery Core Facility in the Cell Transplant Center
Chief of the Division of Liver and Gastrointestinal (GI) Surgery
Administrative

Dr. Mitra Zehab, Chief Operating Officer and Deputy Director
Margie Collado, Chief Financial Officer
Angie Arzani, Manager, Finance
Sabiha Bouazreg, Sr. Manager, Business Operations
Edmundo Caldera, Accounting Assistant
Dora Cardenal, Manager, Accounting
Ligia Delgado, Accounting Assistant
Marc Friedenthal, Buyer
Mabel Luis, Executive Assistant
Grace Perez, Sr. Buyer
Juan Perez-Scholz, Manager, Sponsored Programs
Ilvis Torres, Administrative Assistant

Medical Development
Gary Kleiman, Sr. Development Director, Major Gifts
Aimee Siegel-Harris, Manager, Donor Relations

Bio-Informatics
Roopesh Sadasivash Reddy, Database Administrator

Clinical Chemistry Lab
Dr. Armando Mendez, Research Associate Professor
Dr. Ronald B. Goldberg, Professor of Medicine
Elsa Carbo, Sr. Research Assistant
Rosa Hernandez, Sr. Research Lab Tech
Dr. Erica Leonardi, Research Scholar
Espe Perez, Supervisor, Medical Technology

Clinical Cell Transplant Program (CCTP)
Dr. Rodolfo Alejandro, Professor and Director
Dr. Livio Luiz, Adjunct Professor of Surgery
Dr. Eduardo Peixoto, Post Doctoral Associate
Alina Cueno, Sr. Medical Biller
Eva Herrada, Manager, Research

Clinical Research Center
Dr. Luigi Meneghini, Associate Professor of Clinical Dr. Claudia Arribia, Post-Doctoral Associate
Ada Konwal, Sr. Research Assistant
Burlett Masters, Research Support Specialist
Jose Carlos Amecua Martinez, Research Scholar

Diabetes Prevention Program (Type 2)
Dr. Ronald B. Goldberg, Professor of Medicine
Jeanette Gonzalez-Calles, Research Associate
Juliet Ojito, Nurse Specialist, Research
Lissett Oropeza, Senior Research Associate
Wanda Ramirez, Secretary
Bertha Veciana, Medical Assistant

Drug Discovery Program
Dr. Peter Buchwald, Director
Dr. Sirlene Cecchini, Sr. Research Associate

Eleanor and Joseph Kosow Diabetes Treatment Center
Faculty
Dr. Ronald B. Goldberg, Professor of Medicine
Dr. Jennifer Marks, Professor of Clinical
Dr. Luigi Meneghini, Professor of Clinical Medicine
Dr. Daniel H. Mintz, Professor of Medicine
Dr. Bresta Miranda-Palma, Assistant Professor of Medicine
Dr. Jay S. Skyley, Professor of Medicine, Pediatrics and Psychology
Dr. Maria del Pilar Solano, Assistant Professor of Clinical Medicine

Health Care Professionals
Andrea Allouche, Dietitian
Alejandra Cardovez, Dietitian
Kellie Rodriguez, Manager, Nursing
Aleida Saenz, Nurse Educator
Dr. Rogelio Suarez, Clinical Research Coordinator
Allison Wich, Advanced Registered Nurse Practitioner

Clinic Administration
Dina Bardales, Sr. Patient Access Representative
Arleen Barreiros, Sr. Administrative Assistant
Starlette Canamero, Sr. Administrative Assistant
Odaly Cano, Patient Access Representative
Ilana Gonzalez, Patient Access Representative
Evelin Gonzalez-Paniagua, Patient Access Representative
Rubin Michel, Patient Access Representative
Harriammys Suarez, Patient Access Representative

Flow Cytometry Lab
Dr. Oliver Umland, Assistant Scientist

Human Cell Processing (cGMP) Facility
Asha Khan, Director, Laboratory Services
Dr. Elina Linetzky, Director, Quality Assurance
Xiumin Xu, Director, China-US, Collaborative Human Cell Transplant Program
Dr. Alejandro Alvarez-Garcia, Associate Scientist
Carmen Castillo, Research Laboratory Technician
Dr. Omaira Malik, Associate Scientist
Kevin Peterson, Research Associate
Tammy Susumnur, Sr. Administrative Assistant
Dr. Joel Suszt, Scientist
Dr. Xiao Jing Wang, Associate Scientist

Image Analysis Facility
Dr. George McNamara, Scientist

Immunobiology of Islet Transplantation
Dr. Luca Inverardi, Director
Dr. Paolo Serafini, Research Assistant Professor
Dr. Kamalaveni Prabakar, Scientist
Dr. Alessia Zoso, Scientist
Kevin Johnson, Sr. Research Associate
Rejane Lamazres, Research Associate
Dr. Roberto Codella, Research Scholar
Dr. Giacomo Lanzoni, Research Scholar

Immunogenetics Program
Dr. Alberto Pugliesi, Director
Dr. Isaac Snowhite, Associate Scientist
Dr. Francesco Vendrame, Scientist
Gloria Allende, Jr. Research Associate

Islet Physiology
Dr. Per-Olof Berggren, Director
Dr. Midhat Abdulreda, Post Doctoral Scholar
Dr. Alberto Fachado, Sr Research Associate
Dr. Rayner Rodriguez-Diaz, Research Associate
Dr. Joana Almaka, Research Scholar

Microbiology and Immune Tolerance
Dr. Tom Malek, Director
Dr. Allison Bayet, Assistant Professor
Cecilia Cabello, Research Scholar

Molecular Biology
Dr. Ricardo Pastoni, Director
Dr. Dagmar Klein, Scientist

Nephrology
Dr. Alessia Formoni, Assistant Professor of Clinical
Dr. Johanna Guzman, Post Doctoral Associate
Dr. Dony Maiguel, Sr. Research Associate
Dr. Rodrigo Villarreal, Post Doctoral Associate
Dr. Yao Tae Hyun, Research Scholar

Pre-Clinical Cell Processing and Translational Models
Dr. Antonello Pileggi, Director
Dr. Damaris Molano, Scientist and Core Director
Dr. Carmen Fotino, Post Doctoral Associate
Maité Lopez-Cabezas, Research Associate
Adriana Lopez-Ospina, Research Assistant
Yelena Gadea, Sr. Veterinary Technician
Irayme Labrada, Research Assistant
Alejandro Tamayo-Garcia, Research Assistant
Elise Zähr, Jr. Research Associate
Carlo Rosati, Research Scholar

Pre-Clinical Research
Dr. Norma Sue Kenyon, Director
Dr. Dora Berman-Weinberg, Research Associate Professor
Waldo Diaz, Manager, Research Laboratory
Dr. Dongmei Han, Scientist
Ana Hernandez, Associate Scientist
Tamura Levine, Sr. Manager, Business Operations
Ema Poumian-Ruiz, Supervisor, Research Laboratory
James Geary, Veterinary Tech
Alexander Rabassa, Research Associate
Reiner Rodriguez-Lopez, Veterinary Technician
Melissa Willman, Sr. Manager, Research Laboratory

Stem Cell Development for Translational Research
Dr. Juan Dominguez-Bendala, Director
Silvia Alvarez, Manager, Research Laboratory
Dr. Nancy Vargas, Research Associate
Simona Maciotta, Research Scholar
Carmen Rodriguez, Research Scholar

Biomedical & Tissue Engineering
Dr. Cherie Stabler, Director
Dr. Jeffrey Hubbell, Research Scholar
Dr. Kerim Gattas-Asfura, Associate Scientist
Jaime Giraldo, Research Associate
Dr. Heerman Rengifo, Post Doctoral Associate
Dr. Alice Tomel, Research Assistant Professor
Dr. Chris Fraker, Research Assistant Professor
Elda-Margarita Duran, Research Associate
Vita Manzoli, Sr. Research Associate
Chiara Villa, Research Scholar

Diabetes TrialNet
Dr. Jay Skysky, National Chairman
Dr. Norma Sue Kenyon, Associate Chair for Immunology
Dr. Jennifer Marks, Principal Investigator – TrialNet Clinical Center
Dr. Alejandro Pugliese, Co-Investigator, Clinical Center
Lisa Falkin-Meriv, Study Co-Chairman
Ray Arce, Registered Nurse
Dr. Carlos Blascio, Clinical Research Coordinator
Della Matheson, Trial Coordinator
Elizabeth Machado, Administrative Assistant
Irene B. Santiago, Sr. Administrative Assistant
The Diabetes Research Institute Foundation (DRIF) is the organization of choice for those who are serious, passionate and committed to curing diabetes. Its mission – to provide the Diabetes Research Institute with the funding necessary to cure diabetes now – is a testament to the belief that tomorrow is not soon enough to cure those living with diabetes.

The Diabetes Research Institute has become the world leader it is today through the substantial funding provided by the Foundation. Supported by private philanthropy, the DRIF ensures the jumpstarting of new ideas and the continuation of innovative research projects that remain cure-focused and will ultimately benefit those with diabetes.

The DRIF’s history of commitment dates back to 1971 when it was founded by a small group of parents of children with diabetes who were dedicated to finding a cure. Driven by a shared mission, they banded together to support a promising research program at the University of Miami solely aimed at curing those living with diabetes. In an unprecedented partnership that spans more than two decades and continues today, the AFL-CIO’s Building and Construction Trades Department (BCTD) joined with the Foundation’s leadership to help fulfill its mission to cure diabetes. The DRIF’s largest contributor, the BCTD committed to funding – and building – the Diabetes Research Institute facility. The unions have raised tens of millions of dollars for the DRI and today, under the banner of Project Type Zero, thousands of union members undertake fundraising projects nationwide to provide ongoing support.

The DRIF Foundation is recognized as one of the world’s most respected diabetes organizations. Garnering the attention of influential people who are personally affected by diabetes, the Foundation has grown into an international coalition of business leaders, celebrities, scientists, clinicians, families and other concerned individuals who have elevated the importance of cure-focused research and provided meaningful support for the DRI’s multidisciplinary research program. This funding is provided through individual and corporate donations, special events, sponsorships, cause marketing relationships and planned giving, which allows donors to provide a gift in the form of a will, trust or other deferred giving vehicle.

In an effort to increase awareness about the latest advances toward a cure, the Foundation conducts a wide variety of activities both online and offline, hosts research updates and workshops for people with diabetes and their families, and produces numerous printed publications and e-communications to make this information accessible to people nationally and internationally. A 501(c)(3) not-for-profit corporation, the DRI Foundation has thousands of supporters in the United States and worldwide, and, in addition to its headquarters in Florida, operates regional development offices in New York, Long Island and Washington, D.C.

The Diabetes Research Institute Foundation was created for one reason – to cure diabetes – which is and will continue to be its singular focus until that goal is reached. For the millions of individuals and families affected by diabetes, the Diabetes Research Institute Foundation is the best hope for a cure.
message from the chairman and president

After launching our Reason to Believe campaign last fall, there was an outpouring of emotion from the diabetes community. Notes of gratitude were emailed to us and posted on our social media pages from around the world. Parents wrote about their children. Those with diabetes expressed hope for themselves.

The R2B campaign reaffirmed our tireless dedication to a cure-focused mission, shined the spotlight on this significant department and renewed hope that we will get the job done. In one of our videos, DRI researchers asserted their own reasons to believe, enumerating a string of research accomplishments in support of that notion, many of which are outlined in the Research Review section of this report. You can also hear about this progress directly from our scientists by viewing the Diabetes 2.0 research update online at DiabetesResearch.org/Diabetes2_0.

The DRI has made quantum leap over time and much was accomplished this past year. From investigating ways to eliminate the need for powerful anti-rejection drugs by using the body’s own cells, to identifying new sources of stem cells to increase supply, to building a bio-engineered novel, conformal coating to protect islet cells, the millions of children and adults living with diabetes.

Progress on this scale is only possible with a true disease. DRI Scientific Director Dr. Camillo Ricordi, own cells, to identifying new sources of stem cells to increase supply, to building a bio-engineered novel, conformal coating to protect islet cells, the millions of children and adults living with diabetes.

Many of these strategic alliances reach across the globe, while others are practically in the DRI’s backyard, like our partnership with Hackensack University Medical Center (HUMC). The two world-class centers were brought together through the passionate commitment of the Inserra family, who created the The Lindsay Diabetes Research Foundation at Hackensack University Medical Center to support this combined research effort. The Inserra family is one of our most substantial contributors and their support of the DRI goes well beyond the DRI-HUMC alliance, which is just one example of their generous involvement over the years.

Also this year, another long-time donor, Shirley Harris, reconfirmed her commitment to the DRI with an extraordinary legacy gift of $3 million to ensure that research toward a cure will continue beyond her lifetime. In honor of her generosity, we dedicated the Shirley Harris Administrative Pavilion during a special ceremony and installed a permanent tribute in the DRI lobby.

Major grants received from foundations serve as an important source of funding. We are grateful to the Children with Diabetes Foundation, the Foundation for Diabetes Research, the Fred and Mabel R. Parks Foundation, and the Peacock Foundation, among many others, that have supported countless research projects.

Significant contributions like these are the lifeblood of this organization and sustain the Institute’s scientific program. While we are grateful for this support, we are still facing harsh fundraising challenges.

Overall, these larger gifts have not rebounded at adequate levels. Indeed, there are positive signs of improvement in many industries, but the continued uncertainty in the global economic environment has affected many in the nonprofit sector, the DRI Foundation included. In response, we have continued to streamline the Foundation’s operations and implemented additional cost-saving initiatives.

Despite these challenges, our main priority remains providing our scientists with the funds they need to continue their research and maintain the scientific program at its highest standard. To bolster a steady stream of revenue, we are embarking upon a number of exciting initiatives, one of which is our participation in the University of Miami’s new $1.6 billion campaign, Momentumz: The Breakthrough Campaign for the University of Miami. The DRI Foundation has made the lead gift to this campaign, pledging $300 million for the DRI, a Center of Excellence at UM’s Miller School of Medicine. A gift of this magnitude presents a tremendous opportunity to fund the research at an unprecedented level and finally put an end to this disease.

While major gifts are most critical, income from events throughout our regions and the dedicated volunteers who make those events happen are invaluable. This past year, hundreds attended our three family events – Carnival for a Cure in New York City or Kids Party for a Cure in Long Island and South Florida – putting smiles on faces while supporting the work toward a cure.

Our perennial galas, like the Empire Ball, Crystal Ball, and Love and Hope Ball, together with engaging dinners like D.R.E.a.M.S. in the city and Stand Up for a Cure, golf tournaments and many more events throughout the year, brought the DRI message to a growing circle of people and raised much-needed funds for research.

Continuing their decades-long commitment, the men and women of the AFL-CIO’s Building and Construction Trades Department have stepped to the plate to support the DRI, despite suffering hard times themselves. The ongoing Project Type Zero fundraising effort raises significant funds each year through its two hallmark events, DAX’s Day (Dollars Against Diabetes) and the Labor of Love Golf Tournament, and numerous other fundraising activities.

Additionally, our corporate partners initiated a variety of programs on our behalf. In an ongoing alliance, Walgreens in Florida is raising awareness and funds for the DRI through statewide walkathons and other retail-based promotions, employee contests and creative fundraising initiatives. In the diabetes arena, Animas and LifeScan continue to sponsor many of our marketing efforts that reach patients and their families alike. PumpWear, Inc., has also named the DRI as a beneficiary of its “Wall of Change” fundraising effort, which encourages kids to use spare change and photos to tell their diabetes story.

We are grateful for the passionate commitment on everyone’s part to help us reach our ultimate goal. As we continue to work feverishly toward a cure for this disease, we are counting on you, our valued donors, to lend your support and take part in our mission. We cannot do it without you and we thank you for your ongoing generosity and involvement.

Robert A. Pearlm an
President and Chief Executive Officer

[diabetes research institute foundation] 28
Diabetes Research Institute Foundation
Statement of Activities for the Year ended June 30, 2011

<table>
<thead>
<tr>
<th>Support and Revenue</th>
<th>Amount</th>
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<tr>
<td>Contributions</td>
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<td>Reimbursement Contracts</td>
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<td>Special Events, net of expenses</td>
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<td>Investment Income</td>
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<td>Total Support and Revenue</td>
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<td>Program Services</td>
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<td>Community Education</td>
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<td>Total Program Services</td>
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<td>Support Services</td>
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<td>Administration and General</td>
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<td>Fundraising</td>
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<td>Net Assets, Beginning Year</td>
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<td>Net Assets, End of Year</td>
<td>$28,271,045</td>
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<table>
<thead>
<tr>
<th>Fundraising Percentage</th>
<th>Percentage of Support and Revenue</th>
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<tbody>
<tr>
<td>Fundraising Expense as a Percentage of Support and Revenue</td>
<td>17%</td>
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Diabetes Research Institute Foundation Statement of Activities

<table>
<thead>
<tr>
<th>Support and Revenue</th>
<th>Amount</th>
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<tr>
<td>Diabetes Research Institute Foundation</td>
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<tr>
<td>National Institutes of Health Grants</td>
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<td>Juvenile Diabetes Foundation International Grants</td>
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<td>University of Miami</td>
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<td>Kosow Center</td>
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<td>State of Florida Education Grant</td>
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<td>Total Support</td>
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<tbody>
<tr>
<td>Research Grants</td>
<td>$16,847,403</td>
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<td>Research &amp; Clinical Support</td>
<td>1,309,628</td>
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<td>Total Expenditures</td>
<td>$18,157,031</td>
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</tbody>
</table>

Through the support of private philanthropy, the Diabetes Research Institute Foundation has funded six chairs totaling over $10 million:
- The J. Enloe and Eugenia J. Dodson Chair in Diabetes Research
- Stacey Joy Goodman Chair in Diabetes Research
- Mary Lou Held Chair for Diabetes Research
- Martin Kleiman Endowed Investigatorship
- Daniel H. Mintz Visiting Professorship
- and the Ricordi Family Chair in Transplant Immunobiology.

“I saw something a few months back on the DRI website that just blew me away… ‘We are dedicated to putting ourselves out of business by finding a cure for Diabetes. At that very moment, I realized the DRI really and truly cared about families and kids like mine… the people I have met from the DRI have literally changed my life… I know in my heart I am in the right place and supporting the right people… It’s an overwhelming feeling of passion, on both the DRI’s part and on mine.”

-Dawn Liddell
We wish to gratefully acknowledge all of our donors whose continued support has allowed DRI scientists to pioneer new therapies aimed at restoring insulin production, maintain their focus on curing diabetes and lead with Excellence toward a cure for diabetes. The individuals, families, corporations and foundations listed on the following pages have been the backbone of this organization since our inception almost four decades ago. Their names appear in the corresponding giving levels as of December 31, 2011.

Again, we wish to deeply thank all of our donors the world over for your continued support of the Diabetes Research Institute and Foundation.

<table>
<thead>
<tr>
<th>Visionaries</th>
<th>$10,000,000+</th>
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<tbody>
<tr>
<td>Building and Construction Trades/AFL-CIO</td>
<td>J Einzer and Eugenia J. Dobson</td>
</tr>
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<td>Raymond and Russell Johnson*</td>
<td>Sylvia and Rowland Schaffer</td>
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</table>

<table>
<thead>
<tr>
<th>Chairman’s Council</th>
<th>$5,000,000+</th>
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<tr>
<td>Polly and Baron de Hirsch Meyer*</td>
<td>Leon J. Simkins</td>
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<table>
<thead>
<tr>
<th>Leadership Council</th>
<th>$1,000,000+</th>
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<tbody>
<tr>
<td>Anonymous</td>
<td>Michele Bowman and Joseph Underwood</td>
</tr>
<tr>
<td>Canes Entertainment</td>
<td>Trudy and Paul Cejas</td>
</tr>
<tr>
<td>Diabetes Foundation of Florida</td>
<td>Randy Dorfman</td>
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<tr>
<td>The Eftkess Family, Anne and Nate Eftkess</td>
<td>Foundation for Diabetes Research</td>
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<tr>
<td>Stacy Joy Goodman Memorial Foundation</td>
<td>Shirley D. Harris</td>
</tr>
<tr>
<td>Insera Family Foundation</td>
<td>International Association of Bridge, Structural and Ornamental and Reinforcing Iron Workers</td>
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<tr>
<td>International Association of Heat &amp; Frost Insulators and Asbestos Workers</td>
<td>International Brotherhood of boilermakers, Iron Ship Builders, Blacksmiths, Forgers &amp; Helpers</td>
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<tr>
<td>International Brotherhood of Electrical Workers</td>
<td>International Brotherhood of Teamsters</td>
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<td>International Union of Bricklayers &amp; Allied Craftworkers</td>
<td>International Union of Elevator Constructors</td>
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<td>International Union of Operating Engineers</td>
<td>International Union of Painters and Allied Trades</td>
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<tr>
<td>Richard M. Kline*</td>
<td>Eleanor C. and Joseph* Koslow</td>
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<tr>
<td>Larry P. International Union of North America</td>
<td>Alfred P. Lalibert*</td>
</tr>
<tr>
<td>The Molly and Lindsey Diabetes Research Foundation</td>
<td>Operative Plasterers’ &amp; Cement Masons’ International Association of the U.S. &amp; Canada</td>
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<tr>
<td>The Jack Parker Corporation</td>
<td>Peacock Foundation, Inc.</td>
</tr>
<tr>
<td>Ricardo Puente</td>
<td>William and Deborah Rand</td>
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<tr>
<td>Valerie and Camillo Ricordi</td>
<td>Sheet Metal Workers International Association</td>
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<tr>
<td>Dr. Debora R. and Thomas D. Stern</td>
<td>United Association of Journeymen &amp; Apprentices of Plumbing &amp; Pipe Fitting, Sprinkler Fitting Industry of the U.S. &amp; Canada</td>
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<tr>
<th>Governors’ Society</th>
<th>$500,000+</th>
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<tr>
<td>Jeannie and Virgil Christopher*</td>
<td>Rose Cohen*</td>
</tr>
<tr>
<td>Tom Curtis</td>
<td>Kelly and Harold Doran</td>
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<tr>
<td>E.R.A.S.E. Diabetes</td>
<td>Susan Gallagher</td>
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<tr>
<td>Florida Jaycees</td>
<td>Florence Frunk*</td>
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<td>Future Leadership Foundation, Inc.</td>
<td>Douglas D. Craggah</td>
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<td>Susan Gallagher</td>
<td>Paolo and Piero Ludovico Gandini</td>
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<td>Richard L. Gelf Family</td>
<td>Martin Gratowetz</td>
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<tr>
<td>Louise K. and Robert T. Held, Sr.*</td>
<td>Lucio and Derald Jacobson</td>
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<tr>
<td>Carole and Barry Kaye</td>
<td>Blanche E. Knitzel</td>
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<tr>
<td>Isabel and Sam* May</td>
<td>Amy and Alan Metzler</td>
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<td>Million Dollar Hole in One</td>
<td>Ted &amp; Brenda Novak and Family</td>
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<tr>
<td>Penny and Robert A. Pearlman</td>
<td>Phil Peterson Key West Poker Run, LLC</td>
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<tr>
<td>Risa and Jeff Pulver</td>
<td>Reddem Foundation</td>
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<td>Moriam and James J. Senale</td>
<td>The Family of Samantha Max Stern</td>
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<td>Ferne and Daniel Tocci</td>
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<td>ULLICO Management Company</td>
<td>Walgreens</td>
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<td>Bruce and Roberta Waller</td>
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<tr>
<th>Distinguished Humanitarians</th>
<th>$250,000+</th>
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<tbody>
<tr>
<td>Elizabeth M. and Robert W. Bradley*</td>
<td>Jane and Bill Burt*</td>
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<tr>
<td>Henry E. Cabalbin*</td>
<td>Jeet P. Cakela*</td>
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<tr>
<td>Pearl Coullier*</td>
<td>Diabetes Research &amp; Wellness Foundation</td>
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<tr>
<td>Lloyd and Helen Dirlworth Foundation</td>
<td>Betty and Lowell* Dunn</td>
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<tr>
<td>Joan and William J. Fiskinger</td>
<td>Florida Power &amp; Light Employees</td>
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<tr>
<td>Jeanine Forman-Ham</td>
<td>Paula N. Freund*</td>
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<tr>
<td>Dr. and Mrs. Phillip T. George and Family</td>
<td>Linda and Barry Gibb</td>
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<tr>
<td>Nancy and Lawrence E. Glick</td>
<td>Mary and Jay N. Goldberg</td>
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<td>Jill and Alan Greenwald</td>
<td>Fran and Mel Harris</td>
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<td>Barbara Herberg and Family</td>
<td>The Holtz Family</td>
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<tr>
<td>IBM Foundation and Employees</td>
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</tbody>
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| United Brotherhood of Carpenters & Joiners of America |

| United Union of Roofers, Waterproofers and Allied Workers |
| Cliff Viner | Jill Viner |

| Louis Kaizman* | Isolde Kastel* |
| The Martin Kleiman Family | Connee and Harvey Krueger |
| Ladysmith Family Foundation | Tova Linderstrom |
| Sandy and Sidney Levy | Lions Club International |
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| Ethel J. Vilen* |
| Shanghai Club |
| Rita and Stan Weinstein |
| Wellington Foundation |
| The Wofford Family |
| Sally Zab* |
| Sonja Zuckerman |

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<tr>
<th>Grand Founders</th>
<th>$100,000+</th>
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<tr>
<td>Lisette and Norman* Ackerman</td>
<td>Joseph Alexander Foundation, Inc.</td>
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<tr>
<td>Alliance Building Services</td>
<td>Barbara and Philip Althaim</td>
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<td>American Building Maintenance Co.</td>
<td>Arison Family</td>
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<td>Aurora Foods, Inc.</td>
<td>Bankers Life &amp; Casualty Co.</td>
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<td>Autus H. Barker*</td>
<td>The Bastin Family</td>
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<tr>
<td>Alan Boucher</td>
<td>Diane and Bernard Beber</td>
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<td>Margaret and Raymond Berner</td>
<td>Buddy Blau*</td>
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<tr>
<td>Nancy and Jerry Blair</td>
<td>Belle and Albert* Blanton</td>
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<td>Marion and Alfred* Blum</td>
<td>Florence Aweil Blocker*</td>
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<tr>
<td>The Family of D.O. Adam*</td>
<td>H. Stom Boehringer Mannheim Corp.</td>
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<tr>
<td>The Family of H.A. Blum</td>
<td>Delores S. and William K. Brehm</td>
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<tr>
<td>Sylvia Bruence*</td>
<td>Marty B. Bruder</td>
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<tr>
<td>Valeria Arlyne Byam</td>
<td>Carnival Cruise Lines</td>
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<td>synthia D. Carr</td>
<td>Roberta O. and Harvey E. Chaplin</td>
</tr>
<tr>
<td>Children with Diabetes Foundation</td>
<td>The Cohen Family Charitable Foundation</td>
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</table>
Founders - $50,000 +

Dr. and Mrs. Vincent J. Abbatiello
Founders - $50,000 +

Abbott Diabetes Care

AIG

American Fruit & Produce Corp.

Barbara Annis

Lillian Baker*

The Bakery, Confectionary, Tobacco Workers and Grain Millers International Union

Bertinck Veterans Foundation

Bayek and Bronxstonentown

Gloria* and Stanley Goldman

Sigrid Hauckland^  

Health North of South Florida

Henry L. Heifetz

M. L. Turner Foundation

Robert and Melvin Zolls

\[\text{diabetes research institute foundation}\]

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\[\text{diabetes research institute foundation}\]

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The Heritage Society of the Diabetes Research Institute Foundation was created to recognize individuals who have generously provided for our cure-focused research through their will, life insurance, charitable remainder trust and gift annuities, or other deferred giving vehicle. Their selfless legacy ensures that critical funding for the Diabetes Research Institute will continue into the future. Over the years, planned giving programs have allowed many donors to make substantial gifts to the DRI in ways that have complemented their personal financial objectives. Heritage Society members have chosen to create an enduring legacy and perpetuate their philanthropic goals to benefit countless children and adults affected by diabetes. The following list includes our Heritage Society members through December 31, 2011.

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Nancy Barr Bisco
E. Diane Beber
Thomas and Martha Blash*
Michele Bowman and Joseph Underwood
Annemarie and Lester Brockmann
Martty B. Bruder
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Ruth Plaks
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Barbara C. Popp*;
Hildine and Jerome Potashnick
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James and Dr. Wendy Rapaport
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Florida Region

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Nicole Otto
Assistant Director of Special Events
Meris Thomas
Special Events Coordinator

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honorary and regional boards

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national office
The Diabetes Research Institute leads the world in cure-focused research. As the largest and most comprehensive research center dedicated to curing diabetes, the DRI is aggressively working to shrink the timeline toward the discovery of a biological cure for this disease.