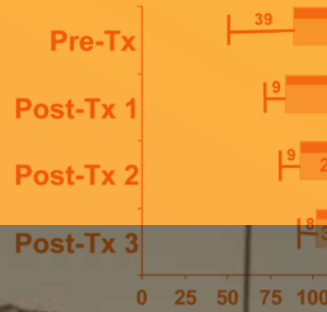
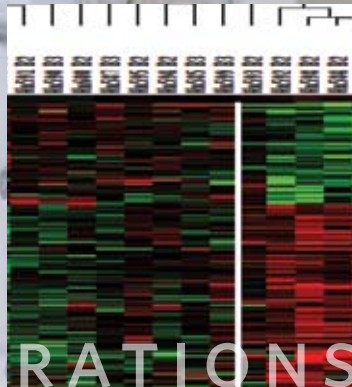




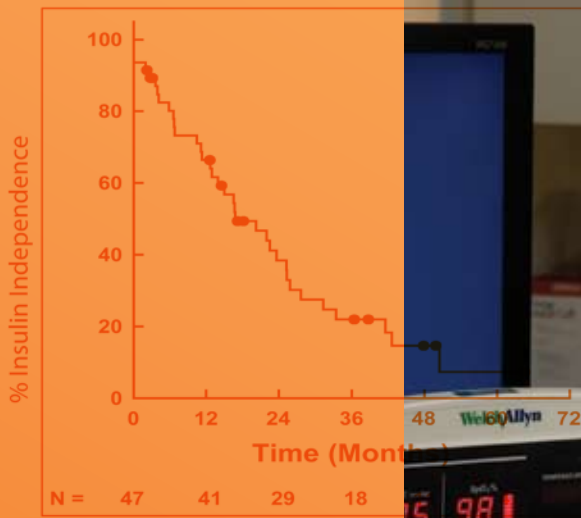
Upper left:  
Foad R. Kandeel, M.D., Ph.D.,  
City of Hope

Center:  
Genomic analysis of islet  
function.

Lower right:  
Donald C. Dafoe, M.D.,  
Director, Pancreas Transplantation,  
Cedars-Sinai Medical Center



# COLLABORATIONS



# ADVANCING AGAINST DIABETES

## ISLET CELL TRANSPLANTATION

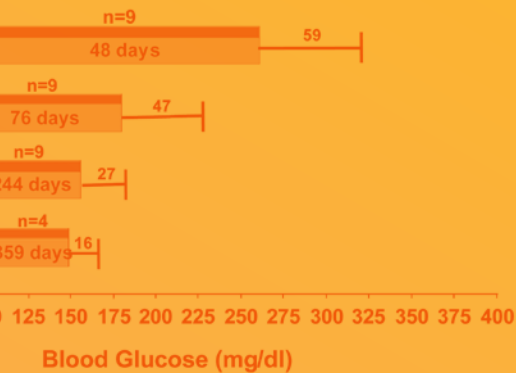
The greatest challenge in medical research is to find a permanent cure for a life-threatening disease. For 5 million people around the world, that disease is type 1 diabetes.

Also called insulin-dependent diabetes, type 1 diabetes is an autoimmune reaction that destroys the beta cells of the pancreas. The result is a lifetime of insulin injections, threats of cardiovascular, nerve and kidney disease, and dangerous low-blood-sugar episodes. While healthy insulin-producing pancreatic islet cells can be transplanted from donor organs, donors are in short supply. And transplant procedures require special technology, immune-suppressing drugs and considerable expertise.

City of Hope is a leader in diabetes research, having pioneered the development of Humulin, the synthetic human insulin that was the first biotechnology product approved by the Food and Drug Administration, now used by millions of diabetics worldwide.

That leadership continues with advancing islet cell transplantation.

As one of only seven islet cell resource (ICR) centers funded by the National Institutes of Health, City of Hope performed the most islet transplants in the United States in 2004 and 2005 and has distributed the largest number of islets to basic science programs in the U.S. since 2004. City of Hope is the only currently funded ICR center in the western U.S. In 2006, the Juvenile Diabetes Research Foundation (JDRF) designated City of Hope



City of Hope's renowned diabetes program, including its lifesaving work in islet cell transplant, is centralized in the Leslie and Susan Gonda (Goldschmied) Diabetes and Genetic Research Center at City of Hope.

as a JDRF Islet Cell Transplant Center, making it one of only 14 in the nation and the only Southern California organization to receive this distinction.

Three clinical trials involving islet cell transplantation are under way at the City of Hope Leslie and Susan Gonda (Goldschmied) Diabetes and Genetic Research Center led by Fouad R. Kandeel, M.D., Ph.D, director, Department of Diabetes, Endocrinology & Metabolism. One study seeks to improve upon the Edmonton Protocol, a widely adopted transplant procedure requiring two to three islet cell infusions. Multiple infusions and organ donors are needed because the drugs used to overcome transplant rejection are toxic to islet cells. As an alternative, the City of Hope phase I/II trial is employing a different immune suppression strategy together with the use of growth factors to expand the number of islet cells before and after transplantation. The goal is to develop a single infusion that can free patients from insulin dependence.

Kandeel also directs the Southern California Islet Consortium (SC-IC), a group of institutions sharing resources and expertise. Hosted by City of Hope, the SC-IC includes Cedars-Sinai Medical Center, Harbor-UCLA Medical Center, Loma Linda Medical Center, the Southern California Transplantation Institute, St. Vincent Medical Center, the Whittier Institute for Diabetes/Scripps Green Center for Organ & Cell Transplantation and the

City of Hope hosts the Southern California Islet Consortium, which represents an integrated effort of multiple academic and transplant institutions to merge resources and efforts in islet transplantation research.

UCLA Center for Health Sciences. Because kidney disease is a complication of diabetes, the SC-IC's first multicenter clinical trial focuses on islet cell transplantation after kidney transplant. City of Hope performs the majority of transplant procedures for the consortium, handles regulatory requirements and trains physicians in islet cell techniques.

With diabetes on the rise worldwide, the absolute shortage of islet cell donors is stimulating the search for new islet cell strategies, including stem cells. Looking beyond diabetes, progress in immune tolerance achieved through islet cell research could pave the way for advances in solid organ transplants, cellular and gene therapies and treatments for autoimmune conditions, Parkinson's disease and many other conditions that would benefit from cell replacement.

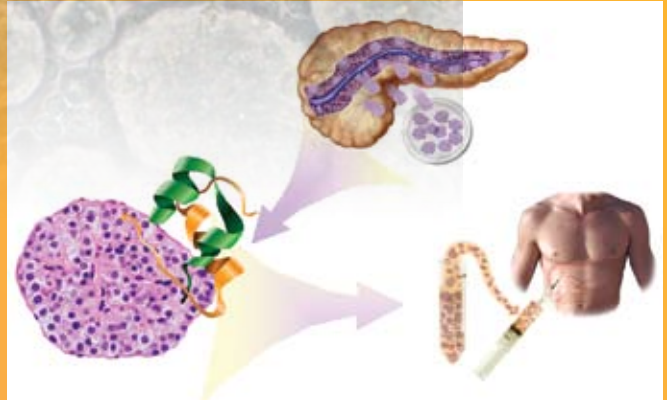
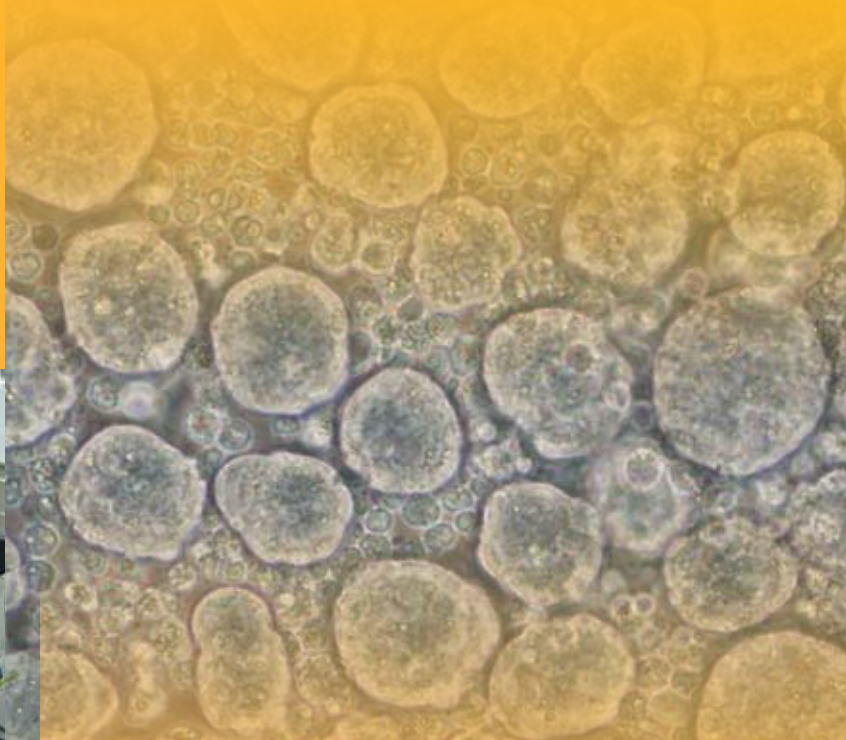
1940 Rachmiel Levine, M.D., City of Hope, discovers pathophysiological basis of type 2 diabetes in 1949

1950

1960

Samual Rahbar, M.D., Ph.D., City of Hope, discovers HgA1c in 1968

1970



City of Hope researchers work on islet cell isolation and distribution for clinical transplantation trials throughout the United States.

1980

Yoko Fujita-Yamaguchi, Ph.D., City of Hope, discovers cell insulin receptor in 1982

Arthur Riggs, Ph.D., and Keiichi Itakura, Ph.D., both from City of Hope, produce synthetic insulin from genetically engineered bacteria in 1978

1990

Leslie and Susan Gonda (Goldschmied) Diabetes and Genetic Research Center dedication in 1997

City of Hope designated as a Juvenile Diabetes Research Foundation Islet Cell Transplant Center in 2006

2000

Establishment of the Southern California Islet Cell Resource Center in 2001

2010

Stem cell transplantation without immune suppression for treatment of diabetes in the future