

## Diabetes Center Celebrates 10th Anniversary



For nearly 80 years UCSF researchers and clinicians have been making breakthrough discoveries that have improved diabetes treatment and care for individuals with diabetes and their families. Ten years ago a new, comprehensive Diabetes Center was created to unite UCSF's research, clinical care and education efforts to more rapidly improve the quality of life of those living with diabetes. Throughout that decade the Center has accelerated its basic research efforts and aggressively pursued promising clinical research to help generate new treatments.

To acknowledge the Center's progress and to celebrate its worldwide partnerships with researchers, clinicians, collaborators, supporters and donors, a number of events will take place this fall in conjunction with a 10th Anniversary Celebration, including a Scientific Symposium and Dinner on Friday, Sept. 24, and a Pediatric Diabetes Family Fun Day & Educational Program on Saturday, Sept. 25. For more information, please contact Suzanne Ritchie at 415/476-6334 or [sritchie@support.ucsf.edu](mailto:sritchie@support.ucsf.edu).



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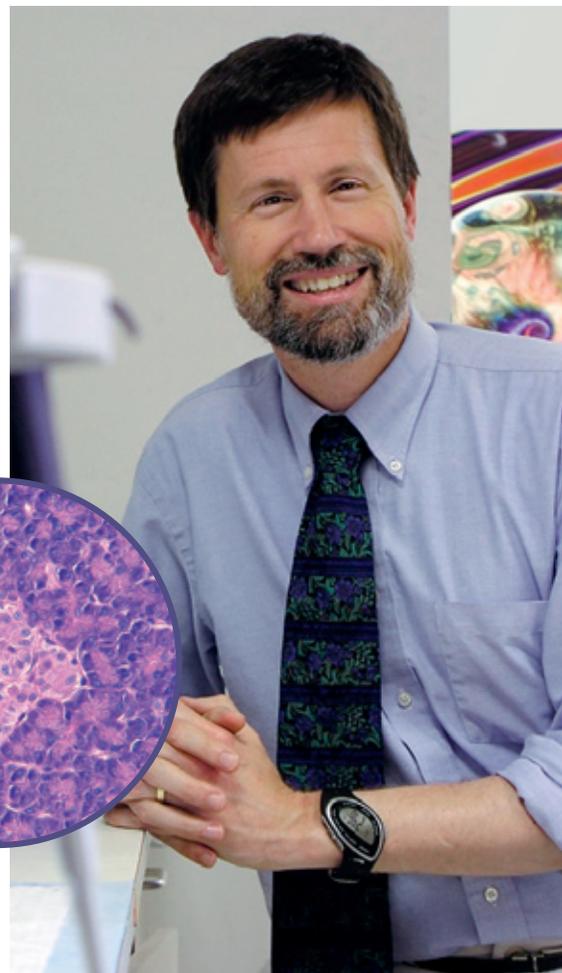
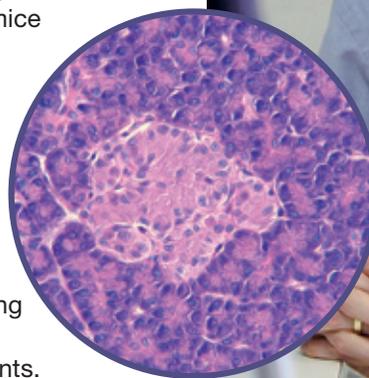
## Breakthrough Discoveries

# Generating Replacement Beta Cells and Halting Beta Cell Destruction

*There are two parts to the puzzle of curing type 1 diabetes: generating new insulin-producing beta cells to replace those destroyed by the disease, and stopping the autoimmune destruction of these cells so that the disease does not return. Groundbreaking research conducted by two faculty members is enabling the UCSF Diabetes Center to make progress on both fronts.*

Scientists are one step closer to generating replacement beta cells thanks to a recent study involving a previously unexamined gene known as Rfx6. It appears that this gene is necessary for cells to differentiate into beta and other types of cells in the pancreas. This study was led by Michael German, MD, UCSF Diabetes Center clinical director and the Justine K. Schreyer Endowed Chair in Diabetes Research, and his colleague Constantin Polychronakos, MD, of McGill University.

German's team, led by Stuart Smith, PhD, found that mice lacking the Rfx6 gene failed to generate most of the normal cells in the pancreas, including beta cells. They also found that the absence of this gene in humans will cause a complete absence of insulin, leading to a rare syndrome of neonatal diabetes in infants. Published in the prestigious journals *Nature* and the *New England Journal of Medicine*, this study provides vital insights for both beta cell development and insulin production. It may also help create new drugs to regenerate beta cells in patients with diabetes.



Michael German; pancreatic beta cells (inset)

*Continued inside*

# New Diabetes Education Program Available for Bay Area Businesses

Last year the UCSF Diabetes Teaching Center launched its free, online educational website for the public, *Diabetes Education Online*: [www.deo.ucsf.edu](http://www.deo.ucsf.edu). This year the Diabetes Teaching Center has created a new public service program to help educate employers and their employees on diabetes and disease prevention.

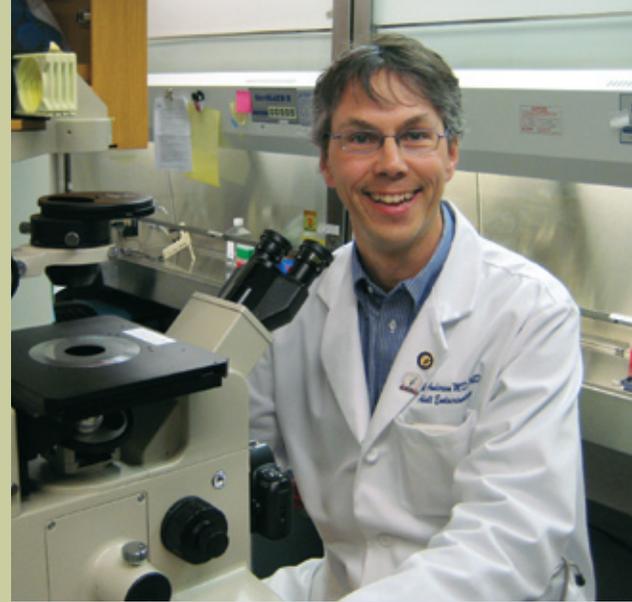


Peggy Huang

Thanks to generous philanthropic support, one-hour diabetes group instruction is being provided to local businesses in the Bay Area, free of charge. These informational sessions are being led by Peggy Huang, RN, CDE, an accomplished diabetes nurse educator who co-founded the Teaching Center.

Bay Area employers should be concerned about the rising incidence of diabetes in today's society, especially since one in three families is affected by diabetes or is at risk for contracting the disease. Providing education on prevention, warning signs, common myths and general treatment options is vitally important to keep staff healthy and happy.

**To sign up your company for this new program, please contact Lorraine Stiehl at 619/885-1212 or [lstiehl@diabetes.ucsf.edu](mailto:lstiehl@diabetes.ucsf.edu).**



Mark Anderson

## Breakthrough Discoveries

*Continued from front page*

In order to tackle the second part of the type 1 diabetes puzzle, it is important to study the process of autoimmunity. It's long been known that autoimmune diseases such as type 1 diabetes occur when the immune system's T cells attack "self" cells, including insulin-producing beta cells. Mark Anderson, MD, PhD, the Robert B. Friend and Michelle M. Friend Endowed Chair in Diabetes Research, is rapidly unlocking the mystery of autoimmunity through his discovery of a unique gene called AIRE that enables a group of specialized educator cells in the thymus to teach developing T cells how to identify and not attack "self."

In a recent breakthrough discovery published in *Science*, Anderson and his colleagues identified a "back-up" system that appears to help catch any dangerous T cells that may have escaped elimination in the thymus. A new class of cells named extrathymic AIRE-expressing cells (eTACs) resides outside the thymus in the lymph nodes and spleen, where immune cells circulate to patrol the body for pathogens. These eTACs can directly contact and destroy renegade self-reactive T cells. The discovery of these cells outside the thymus suggests that this self-educational system may extend throughout the rest of the body, hinting at a potential role for "continuing education" in maintaining immune tolerance to "self."

By targeting specific genes or proteins to these eTACs, Anderson hopes to improve the body's educational system to prevent immune cells from attacking the beta cells.

## Diabetes Center Leadership Council

In this 10th year of the Diabetes Center at UCSF, it is important to recognize the tremendous contributions of the Leadership Council. This organization was formed in the summer of 2001 and has provided guidance, advocacy, and business and community expertise – in addition to critically important philanthropy – to support the Center's multidisciplinary research, compassionate clinical care and cutting-edge diabetes education. Thanks to the members of the Leadership Council, research facilities have been created, clinical care facilities have been renovated, faculty members have been recruited, endowed chairs have been awarded to deserving faculty, clinical care and education programs have been expanded, and exciting basic and clinical research discoveries have occurred. Thanks to all of the members of the Leadership Council, and to all friends and donors, for your ongoing support of the Diabetes Center at UCSF.

### 2009-2010 Leadership Council Members

Lisa Altman  
A.W. Clausen  
Thomas M. Coleman  
Robert B. Friend  
Loren K. Gordon  
Michael B. Gordon  
J. George Hume  
Joanne Kagle  
Robert C. Kagle  
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Alan B. Lefkof  
Donald A. Lucas  
Sarah S. Lucas  
Connie C. Price  
P. Anthony Price  
Chara Schreyer  
Will K. Weinstein  
Michael W. Wilsey

# History of Diabetes Research and Clinical Care at UCSF

As we celebrate the 10th anniversary of the comprehensive Diabetes Center that united the research, clinical care and education aspects of diabetes efforts at UCSF, we also celebrate the many scientists who have made breakthrough discoveries in diabetes in previous decades. Over the past 80 years UCSF researchers and clinicians:

- cloned the gene that produces insulin, making possible the unlimited supply of human insulin available today
- discovered that glucagon was the hormone needed to prevent hypoglycemia
- co-founded stem cells that are widely believed to have implications for diabetes and for numerous other diseases
- identified autoimmune predictors of type 1 diabetes, helping to develop tests to predict those at risk for developing the disease
- were the first to demonstrate that elevated blood sugar caused health complications, helping to pioneer the intensive glucose-control strategies now utilized throughout the world
- were the first to link obesity to type 2 diabetes, resulting in revolutionary changes in diabetes treatment and prevention
- first described the changing phases of insulin secretion, used today for detecting early defects in type 2 diabetes and for insulin therapy in type 1 diabetes.

Two research units at UCSF played major roles in these advances – the Hormone Research Institute (HRI) and

the Metabolic Research Unit (MRU). The scientists who worked in these units were instrumental in shaping the future of research and clinical care for both type 1 and type 2 diabetes at UCSF and throughout the world.

## Patient Care Legacy

As researchers in the HRI and MRU were making significant discoveries, UCSF clinicians were blazing new trails with innovative clinical care and education programs for people with diabetes.

In the midst of the Great Depression, UCSF pediatric physicians

founded the first camp for diabetic children west of the Mississippi, and one of the first in the country, forever altering the lives of children with diabetes.

Additionally, thanks to the vision and dedication of our adult diabetes clinicians, including Peggy Huang, RN, CDE, the UCSF Diabetes Teaching Center was launched in 1977. One of the first comprehensive programs of its kind, the Diabetes Teaching Center united physicians, nurses, counselors, pharmacists and nutritionists to provide individuals with diabetes education and self-management resources. Thousands of people around the world have benefited from its workshops and programs.

## A New, Comprehensive Program to Accelerate Advances

Ten years ago, Jeffrey Bluestone, PhD, one of the world's leading experts on the body's immune system and autoimmunity, came to UCSF. In addition to leading his own research program, Bluestone, the A.W. and Mary Margaret Clausen Distinguished Professor, was

charged with uniting the HRI, the MRU, the pediatric and adult diabetes clinics, and the Diabetes Teaching Center into one comprehensive program.

Bluestone, whose research has catalyzed recent progress in stem cell research, islet cell transplantation and immune tolerance therapies, created a team of researchers and clinicians that strengthened the diabetes research program, launched a clinical research effort and helped improve the quality of life for patients with diabetes. Since 2000 they have:

- initiated phase III clinical trials of a promising monoclonal antibody to investigate its ability to halt the autoimmune destruction of insulin-producing beta cells in type 1 diabetes
- created one of the world's most advanced stem cell programs in diabetes focused on creating an unlimited source of beta cells
- established one of the first, fully certified, state-of-the-art human islet and cellular transplantation facilities to help isolate pancreatic islets for transplantation
- developed less toxic anti-rejection therapies to preserve insulin-producing beta cells without causing dangerous side effects for patients.

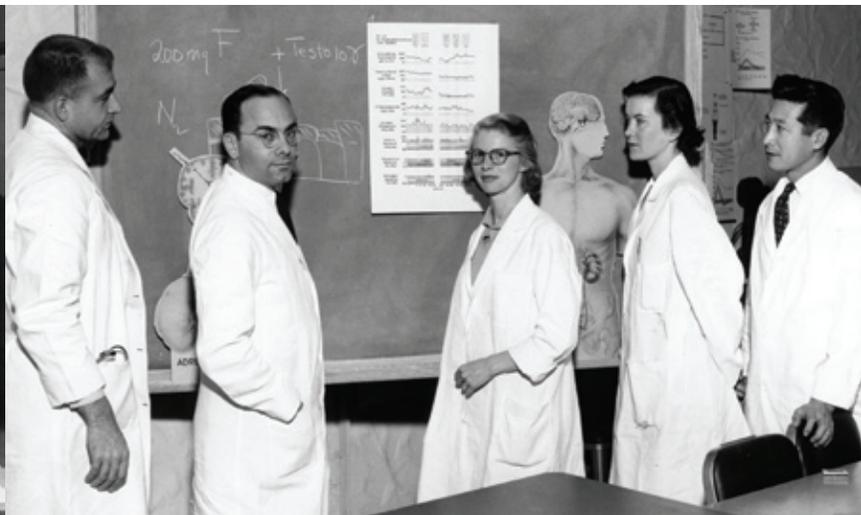
## A Promising Future

Everyone involved in the Diabetes Center is intensely proud of its history of research innovation and its tradition of providing quality education and care for diabetes patients from all walks of life. Our successes have given us a confidence that helps us to focus on the possibilities of the future.



William Rutter (pointing) and Raymond Pictet (far left) consult with colleagues over a DNA gel in the Hormone Research Institute.

Vincent DiRaimando (left), Peter Forsham (second from left), Satoshi Hane (far right) and colleagues in the Metabolic Research Unit.



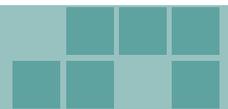
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# NEWS

 from the  
**Diabetes Center**  
at UCSF

SPRING 2010

**For more information on any of these stories, contact  
Suzanne Ritchie at 415/476-6334 or [sritchie@support.ucsf.edu](mailto:sritchie@support.ucsf.edu).**

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## A Message from Jeffrey Bluestone

**A**s you may have heard, after 10 years as the director of the Diabetes Center I have accepted a new opportunity at UCSF and am serving in the position of executive vice chancellor and provost. In this role I am honored to be guiding the research and academic enterprise of this outstanding institution.

Even though my position has changed, please know that I remain committed to the Diabetes Center through my research lab, which I continue to manage. In addition, I will continue to work with our incredibly talented and dedicated team of researchers and clinicians to maintain the level of excellence we have achieved this past decade. I am confident that the team we've assembled will keep making discoveries in diabetes that will change people's lives.



Jeffrey Bluestone

As members of the Diabetes Center community, you have supported our efforts and helped us to increase our stature and reputation in the country and around the world. Our progress in identifying better treatments and ultimate cures for diabetes would not have been possible without your generosity and support.

Matthias Hebrok, the Hurlbut-Johnson Distinguished Professor and a visionary member of our diabetes

community, has become interim director of the Diabetes Center. Dr. Hebrok is one of the world's foremost experts on pancreatic development. He joined the UCSF faculty in 1999 after completing his post-doctoral training as a Howard Hughes Medical Institute fellow under Douglas Melton, PhD, at Harvard and, earlier, his graduate work at the Max-Planck Institute for Immunobiology in Freiburg, Germany.

Again, thanks to all of you for your unwavering commitment to our team and to me personally. Together, we will continue to make progress in our quest to prevent, treat and ultimately cure diabetes.

Sincerely,

A handwritten signature in black ink that reads "Jeffrey Bluestone". The signature is fluid and cursive.

Jeffrey A. Bluestone, PhD

*A.W. and Mary Margaret Clausen  
Distinguished Professor*

*Executive Vice Chancellor and Provost, UCSF*