Pathway to Stop Diabetes®

The Pathway to Stop Diabetes initiative of the American Diabetes Association® is a transformational approach that is creating and supporting a new generation of exceptional diabetes researchers.
The prestigious, nomination-only Pathway awards attract and cultivate brilliant scientists at the peak of their creativity and accelerate research progress by providing substantial and sustained unrestricted funding; guiding the researchers with scientific and career mentoring; and creating systems and programs for collaboration, communication, and career advancement.

Three Pathway grant types support early-career investigators and those established in other fields:

• **Pathway Initiator**—For scientists currently in training through their transition to independence in diabetes research careers

• **Pathway Accelerator**—For diabetes researchers early in their independent careers

• **Pathway Visionary**—For scientists established in another field to apply their expertise and novel approaches to diabetes research for the first time

More than $40 million in generous gifts from individuals, foundations, and corporations, including Pathway corporate sponsors Novo Nordisk, Sanofi, AstraZeneca, the Eli Lilly and Company Foundation, and Merck, have allowed the Association to select and fund 23 stellar scientists who are already accelerating progress in diabetes research.

“**It’s been an honor for Lilly Diabetes to be part of the support for Pathway’s program. Having Pathway awards and Pathway awardees is critical if we are to continue in our efforts to improve outcomes for people with diabetes.”**

– David Kendall, MD, Vice President Medical, Lilly Diabetes
The Pathway Portfolio

The Pathway initiative supports a strong and balanced research portfolio, representing the full breadth of diabetes-related research topics.

2017 Pathway Initiator awardee Jonathan N. Flak, PhD, in the laboratory
The Pathway Scientists

Daniel J. Ceradini, MD, FACS
New York University

Mayland Chang, PhD
University of Notre Dame

Paul Cohen, MD, PhD
The Rockefeller University

Thomas Delong, PhD
University of Colorado, Denver

Michael D. Dennis, PhD
Pennsylvania State University, Hershey

Jonathan N. Flak, PhD
University of Michigan

Zhen Gu, PhD
North Carolina State University and University of North Carolina

Marie-France Hivert, MD
Harvard Medical School

Zachary A. Knight, PhD
University of California, San Francisco

Aleksandar D. Kostic, PhD
Joslin Diabetes Center

Kathleen A. Page, MD
University of Southern California

Stephen C.J. Parker, PhD
University of Michigan
Pathway Progress Through 2016

Cumulatively, the Pathway program has supported 23 investigators who are making substantial progress and achieving key program objectives.

**23**

Pathway scientists selected from

> 400

individuals, nominated as their institution’s single best candidate

**5**

Pathway Initiator awardees have secured their first independent faculty positions

**6**

New Pathway awardees were selected from

106

nominees to start funding in

2017

78

Research projects supported in 2016
38+
Peer-reviewed publications authored by Pathway awardees through 2016

3
Patents filed by Pathway scientists to protect intellectual property and translate discoveries into diabetes tools and cures

>$40M
Raised from corporate sponsors and individual philanthropists to support Pathway

378
research projects supported in 2016

365
24/7

$40M
Raised from corporate sponsors and individual philanthropists to support Pathway
Key Accomplishments of Pathway Scientists in 2016

The 17 Pathway awardees who were funded during the 2016 calendar year made substantial progress in understanding the causes of diabetes and its complications.
**TYPE 1 DIABETES**

Pathway Scientist Thomas Delong, PhD, has discovered a potential trigger for the autoimmune attack that causes type 1 diabetes. 

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**TYPE 2 DIABETES**

Pathway Scientist Stephen Parker, PhD, has identified links between genetics and environmental factors that influence type 2 diabetes risk. 

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**GESTATIONAL DIABETES**

Pathway Scientist Marie-France Hivert, MD, has discovered that gestational diabetes differs from one woman to another, and the different causes lead to different outcomes for women and their children. 

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**DIABETES COMPLICATIONS**

Pathway Scientist Michael Dennis, PhD, has identified a master regulator of diabetic retinopathy, the leading cause of blindness in working age American adults. 
Pathway Scientists Drive Progress

COMMUNICATING ADVANCES TO MOVE THE FIELD FORWARD

Science succeeds by building on the collective knowledge of the field. Communicating results—through publications and presentations—is how scientists share their findings with their peers and drive progress. Pathway scientists collectively have published nearly 40 research papers and reviews. In 2016 alone, they published 22 original research manuscripts and four reviews, and delivered 147 presentations. In addition, all of the awardees presented their research at the American Diabetes Association’s Scientific Sessions, the world’s largest diabetes meeting.

“AstraZeneca is committed to pushing the boundaries of science to discover life-changing medicines. A big part of that commitment has been our support of the Pathway to Stop Diabetes program. The support of these up-and-coming researchers is critical to advance the science for the treatment of diabetes.”

— Jim McDermott, Vice President, Medical Affairs—Diabetes, AstraZeneca

Above: 2015 Pathway Visionary awardee Mayland Chang, PhD (right), talks with Mentor Advisory Group member Lawrence Chan, MD, during the 2016 Pathway Symposium in New Orleans.
SELECT 2016 PUBLICATIONS


Pathway Accelerates Diabetes Research

“Novo Nordisk is dedicated to working on excellence in diabetes and diabetes research. And this program, working together with the American Diabetes Association and supporting young investigators, is important for the future. It’s important for nurturing talent. It’s important also for supporting science that will increase the understanding we have of the diabetes disease, but also will hopefully lead to better therapies for people with diabetes.”

—Peter Kurtzhals, PhD, Senior Vice President and Head of Global Research, Novo Nordisk Inc.

“I think Sanofi engaged in Pathway’s program very early on for a very simple reason. And that is, compared to other disease areas, research in diabetes was actually quite meager, at least from a funding perspective. It really gives the investigator—the recipient of the grant—time to focus on what matters the most, and that is, really, to do the science.”

—Philip Larsen, MD, PhD, Vice President and Global Head of Diabetes Research and Translational Medicine, Sanofi
“I decided to give to the Pathway to Stop Diabetes program because I wanted to be a part of something bigger than myself, something that will have a ripple effect and help many people. I also wanted to encourage the young scientists and let them know that others care about the important work they are doing.”

– Gladyce Anderson, philanthropic supporter of Pathway to Stop Diabetes
“We support the Pathway initiative because we are anxious to see diabetes research progress as quickly as possible, using the best young minds in the country. Research costs money and researchers should not be the ones worried about raising it. Pathway helps scientists stay fully focused on their work and offers us hope that cures are in sight.”

– Eileen and Steven Cortese, founding philanthropic supporters of Pathway to Stop Diabetes
Announcing the 2017 Pathway

This year, 106 institutions nominated Pathway candidates. Of these, six new awardees were selected. They represent the highest quality scientists proposing novel and bold approaches to conquer diabetes.

INITIATOR AWARDS

New Avenues to Avoid Hypoglycemia
Jonathan N. Flak, PhD, University of Michigan, Ann Arbor, Mich.
Project Title: Targeting the VMN to Understand Hypoglycemia Pathogenesis

Diabetes therapies often lead to the risk of hypoglycemia—blood glucose levels that are too low. Hypoglycemia is especially dangerous in individuals who lack the normal nervous system response that alerts them to low blood glucose levels. This condition, which is called “hypoglycemia-associated autonomic failure” (HAAF), causes more frequent and more severe hypoglycemic episodes. This study will explore the role of the brain in development of HAAF. The results will identify potential treatment or prevention targets for HAAF and may also reveal previously unknown mechanisms that regulate glycemic control in diabetes.

The Role of Gut Bacteria in T1D Risk
Aleksandar David Kostic, PhD, Joslin Diabetes Center, Boston
Project Title: Generation of an In Vivo System for Dissection of the Human Type 1 Diabetes-associated Microbiome

The bacteria that inhabit the intestinal tract may contribute to development of T1D. This project will explore whether gut microbes produce a stimulus that causes islet autoimmunity. The study aims to identify particular microbe species, genes, and metabolites that impact the immune system and metabolism in such a way that either promotes or prevents T1D. Specific species associated with T1D will be identified and introduced into animal models to induce autoimmune diabetes. Then the investigators will directly target the microbiota therapeutically in a way that could be translatable to human disease. Targeting the mechanisms by which these microbes impact disease offers a potential new, widely accessible public health approach to preventing T1D.

ACCELERATOR AWARDS

The Impact of Fat-Derived Factors on Glucose Levels
Paul Cohen, MD, PhD, The Rockefeller University, New York
Project Title: Dissecting the Role of Beige Fat in Metabolic Homeostasis

Not all fat cells are the same. Most of the fat tissue in the body is composed of white fat cells that are primarily used for storage of excess energy. In the obese state, white fat cells become inflamed and contribute to diabetes. In contrast, brown fat cells dissipate energy as heat and protect against obesity and diabetes. Beige fat cells are present within white fat. They share many properties with brown fat, and, as a result, are an interesting target for modulating metabolism. This study will test whether factors present in beige fat can reduce glucose production by the liver, thereby lowering blood glucose levels. The results could facilitate the development of novel mechanism-based therapies to treat diabetes and other obesity-associated diseases.
ACCELERATOR AWARDS (CONTINUED)

The Brain’s Role in Glucose Regulation
Sarah A. Stanley, MD, PhD, Icahn School of Medicine at Mount Sinai, New York
Project Title: Central Nervous System Regulation of Glucose Metabolism

The brain is a crucial part of the complex system that regulates blood glucose levels. Defects in these responses limit therapy in T1D and may contribute to T2D. This study examines regions of the brain that may link hormone responses and emotion. These areas may contribute to glucose regulation through circuits linked to the pancreas. The investigators will use novel techniques to determine the contribution of a specific population of glucose-sensing neurons to glucose metabolism and diabetes. With this foundation, future studies will explore whether restoring glucose responses in these neurons can prevent or reverse diabetes and its complications.

VISIONARY AWARDS

Engineering a Minimally Invasive Continuous Glucose Monitoring Patch
Sumita Pennathur, PhD, University of California, Santa Barbara, Calif.
Project Title: Untethering Diabetes Through Innovative Engineering

Achievement of good glucose control in people with diabetes depends on frequent self-monitoring of blood glucose values and appropriate adjustment and administration of therapeutics. Current developments in continuous glucose monitoring (CGM) strive to provide more precise readings with convenient and pain-free devices. This project aims to apply novel engineering approaches to develop a painless, minimally invasive, accurate, and disposable CGM patch. Advances like these will be critical for bringing the benefits of CGM to more people with diabetes.

A New Approach to Reversing Diabetes Complications
David A. Spiegel, MD, PhD, Yale University School of Medicine, New Haven, Conn.
Project Title: Targeting Glucosepane Crosslinks in Diabetes

Glucosepane is a product in cells that results from interactions between proteins and glucose. It occurs naturally in many cellular proteins. Because glucose levels are high in people with diabetes, glucosepane levels are 20 times higher in people with diabetes than those without. High glucosepane is an independent risk factor for the onset of complications of diabetes, including nephropathy, retinopathy, and neuropathy. This project aims to determine the extent of glucosepane modifications in tissues throughout the body, the effects of these modifications, and mechanisms by which glucosepane formation can be altered. The idea is that preventing or reversing glucosepane formation may have the potential to undo diabetes-associated tissue damage.
The Mentor Advisory Group

Eminent leaders in diabetes research serve on the Pathway to Stop Diabetes Mentor Advisory Group. They seek in the Pathway applicants the core elements for exceptional science: rigorous thought processes, keen intellect, and capacity for innovation, creativity, and productivity. And they serve as mentors to the awardees throughout the duration of their grants.

C. Ronald Kahn, MD  
Chair, Mentor Advisory Group  
Joslin Diabetes Center and  
Harvard Medical School, Boston

Domenico Accili, MD  
Columbia University Medical Center,  
New York

Barbara J. Anderson, PhD  
Baylor College of Medicine,  
Houston

Mark S. Anderson, MD, PhD  
University of California, San Francisco

Mark A. Atkinson, PhD  
The University of Florida,  
Gainesville, Fla.

Richard N. Bergman, PhD  
Cedars-Sinai Medical Center,  
Los Angeles

Morris J. Birnbaum, MD, PhD  

Charles Burant, MD, PhD  
University of Michigan Medical School,  
Ann Arbor, Mich.

John B. Buse, MD, PhD  
University of North Carolina School of  
Medicine, Chapel Hill, N.C.

Lawrence Chan, MD  
Baylor College of Medicine, Houston

Silvia Corvera, MD  
University of Massachusetts Medical School,  

Robert H. Eckel, MD  
University of Colorado Anschutz  
Medical Campus, Aurora, Colo.

Michael S. German, MD  
University of California, San Francisco

Margaret Grey, DrPH, RN, FAAN  
Yale University School of Nursing,  
New Haven, Conn.

David M. Harlan, MD  
University of Massachusetts Medical School,  

Barbara V. Howard, PhD  
MedStar Research Institute and Georgetown  
University, Hyattsville, Md.
Barbara Kahn, MD
Beth Israel Deaconess Medical Center, Boston

Steven E. Kahn, MB, ChB
VA Puget Sound Health Care System and University of Washington School of Medicine, Seattle

Martin G. Myers, MD, PhD
University of Michigan, Ann Arbor, Mich.

Christopher B. Newgard, PhD
Duke University, Durham, N.C.

Alvin C. Powers, MD
Vanderbilt University School of Medicine, Nashville, Tenn.

Susan E. Quaggin, MD
Northwestern University Feinberg School of Medicine, Chicago

Christopher J. Rhodes, PhD
MedImmune, LLC, Gaithersburg, Md.

Stephen S. Rich, PhD
University of Virginia School of Medicine, Charlottesville, Va.

Alan R. Salteil, PhD
University of California, San Diego, School of Medicine, La Jolla, Calif.

Jean E. Schaffer, MD
Washington University School of Medicine, St. Louis

Philipp E. Scherer, PhD
University of Texas Southwestern Medical Center, Dallas

Elizabeth R. Seaquist, MD
University of Minnesota, Minneapolis, Minn.

Randy J. Seeley, PhD
University of Michigan, Ann Arbor, Mich.

Gerald I. Shulman, MD, PhD
Yale University School of Medicine, New Haven, Conn.
The American Diabetes Association recognizes the Pathway to Stop Diabetes founding corporate sponsors, Novo Nordisk, Sanofi, The Eli Lilly and Company Foundation, and AstraZeneca, for the generous contributions that ensured the initiative’s successful launch.

Matching Gift Program

Lilly Diabetes challenges other corporations and foundations to support Pathway to Stop Diabetes. We are excited to announce a unique matching gift program for Pathway donations received from new corporate and foundation donors in 2017. Lilly will contribute up to $500,000 in matching funds for corporations and foundations that have not donated in the previous calendar year.

For More Information

Corporations should contact:
Judy Lewis
jlewis@diabetes.org
1-800-676-4065, ext. 1416

Family foundations should contact:
Elaine Curran
ecurran@diabetes.org
1-800-676-4065, ext. 3413
The Association extends deep appreciation for the generosity of the corporate sponsors and philanthropic supporters who have made the Pathway to Stop Diabetes initiative possible.

**PHILANTHROPIC SUPPORTERS**

**VISIONARY**
($1 million and above)

- Pete and Linda Cummin
- Peter and Valerie** Kompaniez
- Drs. Karen Talmadge and John Fiddes
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- Drs. David and Jane Bloomgarden
- Elly and Roger Brtva
- Eileen and Steven Cortese
- Mara Darsow and Anthony Moreau
- Richard J. Farber and Janet M. Leahy
- Vivian and Sarita Fonseca
- John Griffin and Lynn Knaupp
- Dr. and Mrs. Robert R. Henry
- Dwight Holing and Annie Notthoff
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- Dr. David M. Kendall
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- Charitable Trust

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- Robert Singley
- Bess Weatherman

*Contributions through 12/31/2016  **Deceased