

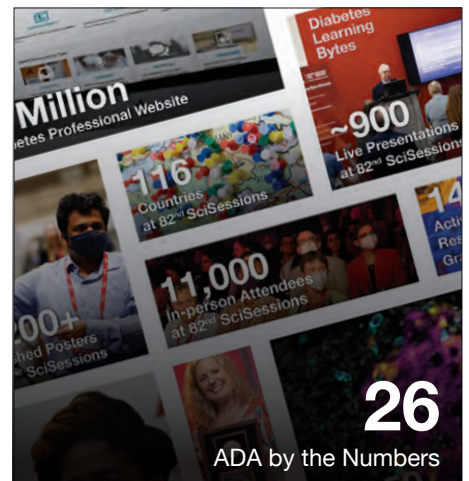
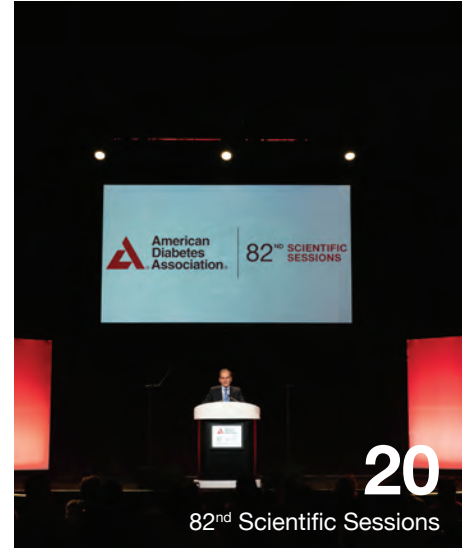
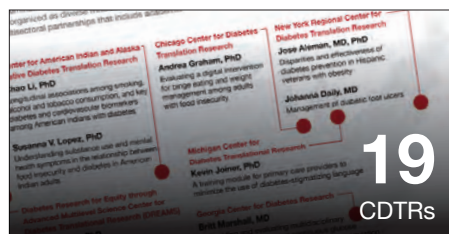
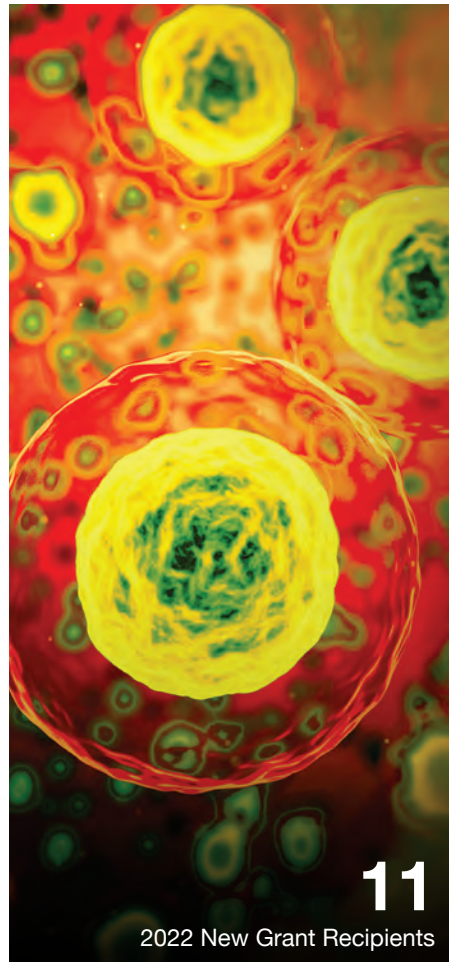
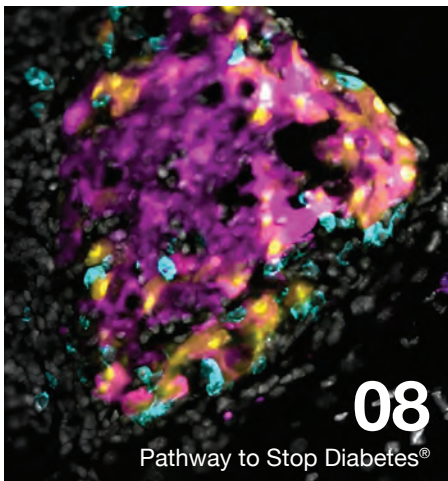
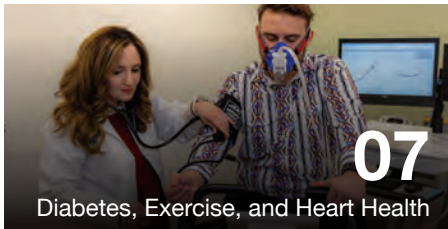
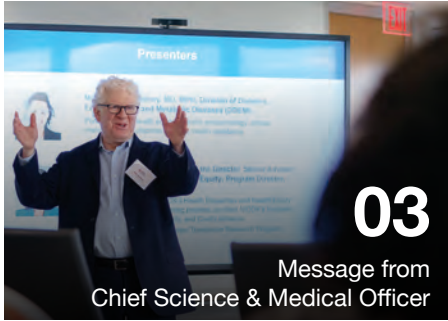


# 2022 Research Report

 **American  
Diabetes  
Association®**

Connected for Life®

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**Message from**  
**Robert A. Gabbay, MD, PhD**  
*Chief Science & Medical Officer*

American Diabetes Association® (ADA) exists to improve care and help people with all forms of diabetes thrive. Research at the ADA is the engine that drives forward discoveries and clinical advances. In 2022, we have had many significant victories. This report highlights some of these achievements.

I am very proud of the ways we are moving forward in diabetes research. In 2020, we made a strategic decision to be more targeted in our research funding. This approach allows us to dive deep and accelerate innovations that are ready for expansion. Our Health Disparities Research portfolio is a great example of this and is on full display in this report. Excitingly, our strategic focus is to help researchers cultivate concepts and establish collaborative networks to maximize their research and, ultimately, their innovations into the hands of individuals with diabetes. This goal strikes the heart of the very nature and intention of ADA research—cultivating scientists and moving discoveries into practice.

The Pathway to Stop Diabetes® (Pathway) program is another example of this collaborative spirit and dedication. Pathway supports extraordinary minds at the peak of their creativity and provides them with the autonomy, flexibility, and resources on the road towards breakthrough discoveries in diabetes. Our formula is to invest in brilliant individuals with the most promising research approaches and strategically pair these trailblazers with world-class mentors to refine and enhance their work. To date, Pathway has been incredibly successful, and in 2022 we added two more brilliant scientists to this remarkable group.

Moving forward, ADA will continue to invest heavily in research—both basic science and translational studies. We are looking for innovative projects that have high impact and push concepts forward. Each year, we will have two funding cycles for targeted research with numerous funding opportunities for all stages of diabetes research professionals. This report presents all the new award recipients, as well as illustrates our continued commitment to cultivating exceptional talent, including early-career scientists, in the diabetes field.

Our commitment to research also spans to our partnership with the Centers for Diabetes Translation Research, which are part of an integrated program funded by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). In addition, this report highlights ADA's 2022 Scientific Sessions, where researchers share exciting progress and study results with the global diabetes community. We hosted our first hybrid event in June 2022, where we welcomed more than 11,000 in-person attendees and thousands more virtual participants.

The last 12 months are showing a vibrant return to normalcy and harbinger exciting developments ahead. We thank you for being part of our efforts and continuing our partnership to creating a world free of diabetes and all its burdens.

Robert A. Gabbay, MD, PhD  
*Chief Science & Medical Officer*



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*Our goal is to improve the lives of all people with diabetes through science, medicine, and health care as a whole. All of us are working towards one common purpose while we continue to focus on a cure.*





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## Health Disparities Research

Pervasive health inequities across the country contribute to higher risks of poor physical and mental health outcomes for people with diabetes from historically minoritized and low-income backgrounds. Inequities are driven by social stressors that include food and housing insecurity, unemployment, and limited access to diabetes supplies and health care.

For example, almost one third of African American grandmothers care for their grandchildren on a full-time basis. Many of these grandmothers are overweight, at risk for diabetes, and unintentionally model unhealthy eating behaviors to their grandchildren. In 2010, the Centers for Disease Control and Prevention (CDC) launched Diabetes Prevention Program (National DPP) to prevent or delay type 2 diabetes through lifestyle changes. The program has been successful but has a high attrition rate among African American participants.

“We have a great program that we know can delay the progression of diabetes, but how do we get buy-in?” asks **A** Eva Marie Vivian, PharmD, University of Wisconsin-Madison. “I decided to use a community-based participatory research approach where I partnered with community organizations to find an ideal way to offer the program to grandmothers at risk for diabetes.”



“Understanding our members’ comprehensive needs, beyond medicine, is key to helping them lead healthy lifestyles for themselves and their families.”

– Eva Marie Vivian, PharmD  
University of Wisconsin-Madison

Dr. Vivian’s project, Healthy Outcomes through Peer Educators (HOPE), enlists grandmothers to serve as peers to other grandmothers, providing encouragement and positive reinforcement to help their peers learn sustainable health behaviors, and be healthy role models to the next generation of African Americans. “The grandmothers are the glue of these communities.”

Dr. Vivian says the peer support efforts are as simple as sharing local resources.

For example, a grandmother was concerned about unhealthy food options in the vending machines in the community center. “She collected over 50 signatures of mothers and grandmothers in the community and met with the management to express the concerns and requested that the vending machines be removed,” she says. “They were successful and now there is a refrigerator stocked with water and fresh fruits and vegetables.”

The study was launched in 2021 and has already shown signs of success. To date, participation in the peer educator intervention group is above 90% while attendance in the control group is about 65–70%.

None of this would have happened without the ADA. “The funding has allowed me to expand my research to other underserved communities. Going forward, I would like to gather information from the grandchildren about their perceptions of their grandmother’s health behavior changes and how it has impacted their lives.”



Another innovative study in the Health Disparities Research portfolio is by **B** Tony Vesco, PhD, a clinical psychologist at Ann & Robert H. Lurie Children’s Hospital of Chicago, who specializes in diabetes psychology and at-risk youth. Dr. Vesco understands the negative impact of chronic health and health disparities from his work with youth in trauma centers.

Dr. Vesco is collaborating with colleagues in the Novel Interventions in Children’s Healthcare (NICH) program at Oregon Health & Sciences University. NICH aims to reduce health disparities for youth with diabetes in socially vulnerable and complex households, such as ones facing food insecurity, homelessness, and trauma.

NICH connects families 24/7 to a behavioral interventionist to help solve issues that get in the way of a child’s health or disease management. The interventionist provides intensive care coordination, case management, and individual and family skill-building.

Kids with diabetes who are exposed to social circumstances have higher A1Cs, more diabetes-related complications, and management difficulties. If we can figure out ways to relieve ongoing social stressors, we believe they will have better health outcomes,” says Dr. Vesco.

Dr. Vesco is comparing the outcomes of children with diabetes from NICH’s intensive intervention model versus the outcomes of children receiving from Lurie and La Rabida Children’s Hospital.

We’re trying to engage our participants by demonstrating interest in them as people first and then as people with diabetes,” says Dr. Vesco. “The flexibility of meeting over Zoom puts families at ease and allows participants who may not otherwise to engage in research.”

With families being more at ease, Dr. Vesco’s team has been able to create nice connections and learn more about them as people, in addition to data collection, which doesn’t typically happen in research studies or in a busy hospital environment.



“ADA’s funding has helped us connect with a team of investigators who have extensive clinical and research experience in working with youth with diabetes and their families to engage on this project in a meaningful way.

– Tony Vesco, PhD  
Ann & Robert H. Lurie  
Children’s Hospital of Chicago  
photo courtesy of Jan Terry, Lurie Children’s



## Education Level

People who have not completed high school have the highest prevalence of diabetes.

- 13.4%** Less than high school
- 9.2%** High school
- 7.1%** More than high school

### Rates of Diagnosed Diabetes in Adults By Race/Ethnic Background



<https://diabetes.org/about-us/statistics/about-diabetes>



ADA is funding several studies focused on addressing health equity among adults with diabetes. These projects include looking to improve disease self-management skills and knowledge among the most vulnerable populations in our society. As an example, **C** Louise A. Reagan, PhD, University of Connecticut School of Nursing, is using a mobile app to help formerly incarcerated individuals with type 1 or type 2 diabetes reenter the community and stay healthy.



**D** Ramin Asgary, MD, The George Washington University, aims to improve disease self-management among homeless individuals with diabetes. Approximately 3.5 million Americans are homeless, and type 2 diabetes is common in this population. An estimated 44% of homeless individuals with diabetes have uncontrolled diabetes, where blood glucose levels remain too high despite treatment, putting the person at risk of short- and long-term complications. Dr. Asgary's project utilizes texting as a way to increase adherence to therapy and to remind individuals to take actions.



Another innovative project is led by **E** Rachel Goode, PhD, University of North Carolina at Chapel Hill, who is developing an effective intervention to curb binge eating and improve long-term management of type 2 diabetes among African Americans living in low-resource communities.



In addition to funding pivotal research, ADA also contributes to scientific progress by convening key stakeholders, fostering collaboration, and enhancing training opportunities. Last November, ADA brought together a group of health disparities researchers to share progress, challenges, and brainstorm solutions. **F** Monica Peek, MD, MPH, from The University of Chicago chaired this meeting, which included leadership from the NIDDK such as **G** Pamela L. Thornton, PhD, Senior Advisor for Workforce Diversity and Health Equity and Program Director of Centers for Diabetes Translation Research.

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## Diabetes, Exercise, and Heart Health

People with diabetes have increased risk of death related to heart disease. Layla Abushamat, MD, MPH, at Baylor College of Medicine aims to reduce these risks.

“My project tests whether fat tissue is a modifiable risk factor for heart failure in type 2 diabetes. It will also look at whether exercise improves fat health and thereby improves heart health. This will play a role in improving heart failure outcomes in those with type 2 diabetes.”

People with diabetes are known to have lower cardiorespiratory fitness than people without diabetes. And it’s important because cardiorespiratory fitness is actually a very big predictor of mortality and morbidity when it comes to cardiovascular disease. People who have low cardiorespiratory fitness have higher cardiovascular disease events and we’re trying to understand that question a little bit better.”

Using data from a comprehensive study, Dr. Abushamat and her team are facilitating a supervised three-month exercise intervention looking at changes in fat across time, and whether they see changes or improvements in heart function.

This research is personal to Dr. Abushamat because diabetes runs rampant on both sides of her family. “I grew up in Southwest Louisiana, where these issues are prevalent,” says Abushamat.

“*When I was 15, I learned about nutrition and was excited about the benefits of healthy eating and how lifestyle changes can effectively manage these diseases, and I asked my dad, who is a nephrologist, whether there was a specific doctor that dealt with obesity and diabetes. He told me about endocrinology and how they look at hormones in the whole body and from that point on, I wanted to become an endocrinologist. We have all these tools and medications that help prevent future complications, particularly with type 2 diabetes, and lifestyle changes are the foundation of these interventions.*

A fellowship with Jane Reusch, MD, at CU Anschutz Medical Center studying exercise and cardiorespiratory fitness in diabetes, led Dr. Abushamat to her current research studying fat hormones, heart disease and exercise in people with diabetes, and establishing relationships between variables to better understand their impact on disease progress.

The ADA grant has allowed her to continue working with Dr. Reusch. “Jane has been an incredible mentor,” says Dr. Abushamat. She’s won multiple mentoring awards, she’s mentored so many PhDs, med students, grad students, and MDs through this whole path. Her passion is infectious. She’s so supportive of women in the field of science and helped establish the Women’s Interprofessional Network of the American Diabetes Association (WIN ADA), a members-only network for female clinicians, scientists, educators, and other health professionals in diabetes. She’s a big proponent for women in their careers and especially as a physician scientist.”



## Pathway Awardees' Achievements



**16+**

Start-up companies founded by Pathway scientists



**>320**

Original publications in high impact scientific journals



**36**

Funded researchers awarded



**>530**

Invited presentations and lectures



**46+**

Patent applications filed



**>700**

Nominations received and reviewed since program inception



**100%**

Initiator awardees secured first independent faculty position within first two years of award

“

*ADA's funding has made a whole world of a difference.*

*It has allowed me to explore ideas that are high risk, but also very high reward. It has also made me visible to the community and important researchers in diabetes doing complementary work to drive progress.*

## Pathway to Stop Diabetes: Outsmarting the Immune System

Judith Agudo, PhD, Assistant Professor in the Cancer Immunology and Virology Department at the Dana-Farber Cancer Institute and Department of Immunology at Harvard Medical School, has been working in beta cell regeneration and diabetes for two decades. As the recipient of ADA's Pathway to Stop Diabetes grant in 2020, Dr. Agudo has reasons to smile.

“We are in a very exciting moment. Recent clinical trials have demonstrated that we are capable of generating beta cells in the lab, which means there's potentially an unlimited supply of beta cells,” Agudo says with the excitement obvious on her face. “I do believe this is going to happen in the near future. All patients could potentially be cured.”

Diabetes is sometimes described as a beta cell disease. For people with type 1 diabetes (T1D), their bodies attack beta cells, which produce the insulin needed to convert food into energy. For people with type 2 diabetes, their bodies are unable to produce enough insulin or the insulin does not function properly.

“We know that replacing the beta cells works, which is amazing, but they require immune suppression that puts the recipient at risk for things like COVID and cancer,” says Dr. Agudo. “So, the next frontier is finding ways to protect the islets from being attacked. We need to be clever and discover how to outsmart the immune system.”





“ *The long-term objective of our work is to make islet/beta cell transplant a feasible and safe reality, by ensuring that these precious cells, once in the patient, are not killed by immune cells.* ”

The Pathway grant—the crown jewel in ADA’s research portfolio—has provided Dr. Agudo with the resources to develop strategies to ensure the survival of transplanted or regenerated beta cells, by effectively and safely cloaking them from immune cells.

The Pathway grant became a launchpad for Dr. Agudo’s research career, as her training began with a doctorate in beta cell regeneration followed by a post-doctoral fellowship in immunology at Mount Sinai Medical Center in New York.

“When I started my own lab with the Pathway grant, I was able to combine my knowledge in immunology with my background in beta cell biology. What we are trying to do is examine the one beta cell that survived and find out how and why it worked,” says Dr. Agudo, “A potential risk of engineering islets is the possibility of changing them so much that they are no longer functional.”

Part of Dr. Agudo’s research with immunotherapy has involved looking at cancer cells. “Cancer cells are very cunning and they actually find ways to escape from immune recognition. We can learn a lot from how tumor cells escape from immune recognition and apply this to precious, vulnerable islets.”

One of the greatest advantages of being a Pathway scientist is access to the Mentor Advisory Group, a group of eminent scientists from diabetes research fields. Dr. Agudo’s mentor is Andrew Stewart, MD, Director of Diabetes, Obesity & Metabolism Institute, at the Icahn School of Medicine at Mount Sinai in New York City.

“I had read so many of Andy’s papers as a PhD student and had always admired his work,” she says. “I was so honored as a Pathway recipient to have the opportunity to work with him given his expertise in beta cell engineering and a track record of successful people that have come out of his lab. He has been super generous with his time and connected me with many people in the field...many more discussions and collaborations, which make my work even more exciting.” Dr. Agudo says.

Dr. Agudo is a visionary who does not hesitate to chase potential, life-altering solutions and will not stop until she finds the solution to protecting beta cells from attack. “Imagine if we had a factory of islets, an off-the-shelf therapy that we could give to everyone with diabetes.” The Pathway grant is bringing Agudo closer to this vision.

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## New Pathway Recipients

### Anna Kahkoska, MD, PhD

*University of North Carolina at Chapel Hill*



**Project Summary:** Psychosocial and behavioral interventions (interventions with psychological, educational, behavioral change, and peer support components) can support individuals living with T1D to attain their best health and wellness outcomes. Yet, even when new interventions are successful in clinical trials, it is notoriously challenging to implement and sustain them in the busy clinical settings where patients receive their routine T1D care.

This proposal aims to learn how to translate evidence-based psychosocial and behavioral interventions into routine care where they will support people living with T1D. The research strategy proposes combining scientific methodology from the fields of implementation science, quality improvement, and precision medicine in a translational pipeline. The early pipeline swiftly implements new evidence-based guidance within routine care, while the latter rigorously tests how well they work and for whom. The use case to test the pipeline will focus on diabetes distress in adults with T1D. This pipeline can be reused to transform T1D care, at scale, by translating other evidence-based psychosocial and behavioral interventions in clinical settings.



### Lisa R Beutler, MD, PhD

*Northwestern University Medical School*

**Project Summary:** Sugary beverages are a major contributor to the diabetes and obesity epidemics, but the mechanisms underlying this connection remain poorly understood. Specifically, it is unknown how chronic overconsumption of sugar compared with the chronic overconsumption of fat changes neural responses to food intake and satiation signals that may lead to the development of obesity or diabetes.

Understanding how diet changes neural dynamics is critical for developing novel approaches to prevent and treat these diseases. Neuromodulatory therapies that harness the ability of the nervous system to control appetite and blood glucose hold tremendous promise in this arena, and not knowing which neural populations to target and how to modulate them remain a major barrier to their implementation. This project seeks to change that and aims to enhance understanding of how nutrition impacts brain function, determine how this goes awry during the development of obesity and diabetes, and identify neural targets for preventing and treating these diseases.



# Centers for Diabetes Translation Research



“ADA’s partnership and financial support of the CDTRs’ pilot and feasibility projects significantly leverages the federal investment in research and helps to grow the science of diabetes and health equity research, as well as nurture the careers of future leaders in the field . . . Making strategic investments in these areas are critically important for building evidence-based solutions to diabetes care and prevention for everyone.

– Pamela L. Thornton, PhD  
Director of the CDTR Program, NIDDK

ADA proudly partners with the Centers for Diabetes Translation Research (CDTR), a program funded by the NIDDK at the National Institutes of Health (NIH).

The CDTR’s aim is to improve the translation of research findings related to diabetes prevention, treatment, and health equity by supporting research across the translational spectrum (i.e., bedside to clinical practice and community settings, dissemination and implementation research). They are organized as diverse multidisciplinary and multisectoral partnerships that include academic

institutions, community health center networks, human service agencies, and other organizations. ADA supported the following pilot and feasibility projects in 2022 to advance research in health disparities and health equity through highly specialized technical expertise as well as support research resources to established and early-stage investigators.

For more information about the CDTR program, visit [diabetes-translation.org/](https://diabetes-translation.org/).

## Center for American Indian and Alaska Native Diabetes Translation Research

### Chao Li, PhD

Longitudinal associations among smoking, alcohol and tobacco consumption, and key diabetes and cardiovascular biomarkers among American Indians with diabetes

### Susanna V. Lopez, PhD

Understanding substance use and mental health symptoms in the relationship between food insecurity and diabetes in American Indian adults

## Diabetes Research for Equity through Advanced Multilevel Science Center for Diabetes Translational Research (DREAMS)

### Sarah Haynes, PhD

A pilot study to improve pediatric to adult transitions of care for adolescents and young adults with T1D from low-income families

### Waghata Semere, MD

Examining clinical decision-making in secure messaging communication among a cohort of racially/ethnically diverse patients with type 2 diabetes and their primary care physicians

## Chicago Center for Diabetes Translation Research

### Andrea Graham, PhD

Evaluating a digital intervention for binge eating and weight management among adults with food insecurity

## Michigan Center for Diabetes Translational Research

### Kevin Joiner, PhD

A training module for primary care providers to minimize the use of diabetes-stigmatizing language

## Georgia Center for Diabetes Research

### Britt Marshall, MD

Embedding and evaluating multidisciplinary diabetes management and continuous glucose monitoring into primary care for vulnerable populations

### Alexandra Morshed, PhD

Identification of complex mechanisms responsible for disparities in participation and engagement in evidence-based weight-gain prevention interventions among mothers of young children

## New York Regional Center for Diabetes Translation Research

### Jose Aleman, MD, PhD

Disparities and effectiveness of diabetes prevention in Hispanic veterans with obesity

### Johanna Daily, MD

Management of diabetes-related foot ulcers

# 2022 New Grant Recipients



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## Research Overview

We are strongly committed to research and have been at the forefront of landmark studies leading to making diabetes a disease we can treat and often prevent. We remain committed to providing critical funding to support innovative scientific discovery that translates to better treatment, healthier lives, and eventual cures.

Since starting research funding in 1952, ADA has invested approximately \$950 million in innovative studies. While we have learned much, there is much left to discover about diabetes.

Today, our research strategy is on strategically targeted topics that we aim to solve in the near future. This approach is helping us invest in meaningful, actionable changes in specific areas that are highly relevant to people with diabetes. We remain dedicated to supporting key aspects of research that have been part of our commitment for decades, such as: funding for early career investigators, fostering the next generation of leaders, and support for investigator-initiated research, generating discoveries that will bring us effective new treatments and paths to a cure.

In 2022, we awarded new research grants on the topic listed below. These topics not only align with ADA's mission, but will have a significant impact on improving the health outcomes of people with diabetes or prediabetes. Each topic offers three funding levels—postdoctoral fellows, junior faculty, and faculty at any level.



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# Precision Medicine Research

Precision medicine is the ability to identify the right treatment for each patient at the right time. ADA is investing in research that generates new insights into factors underlying diabetes, illuminating the differences in how diabetes presents, its variable prevalence, and best practices in clinical care across different populations.



**Kimberly Alonge, PhD**  
*University of Washington*



**Michael Bancks, PhD**  
*Wake Forest University Health Sciences*



**Richard Benninger, PhD**  
*CU Anschutz Medical Center*



**Karen Cerosaletti, PhD**  
*Benaroya Research Institute at Virginia Mason*



**William G. Chang, MD, PhD**  
*Yale University School of Medicine*



**Howard W. Davidson, PhD**  
*University of Colorado Denver*



**William Holland, PhD**  
*University of Utah*



**Phyo Htoo, MD, PhD**  
*Brigham and Women's Hospital*



**Mark Huising, PhD**  
*University of California, Davis*



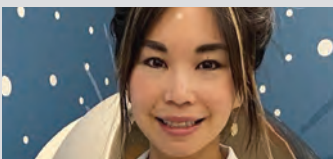
**Josep M Mercader, PhD**  
*Broad Institute, Inc*



**Susanne Mohr, PhD**  
*Michigan State University*



**Rochelle Naylor, MD**  
*The University of Chicago*



**Wei Perng, PhD**  
*Colorado School of Public Health*



**Marcus Pezolesi, PhD**  
*University of Utah*



**Matthew Poy, PhD**  
*Johns Hopkins University School of Medicine*



**Lukasz Szczerbinski, MD, PhD**  
*Mass General Hospital*



**MD Imam Uddin, PhD**  
*Vanderbilt University Medical Center*



**Tiansheng Wang, PharmD**  
*University of North Carolina at Chapel Hill*



“ADA funded my first research proposal to investigate the mechanism leading to diabetic ketoacidosis in obese African Americans. This grant served as the springboard to a successful academic career helping me build a strong research team. Twenty years later, this research has contributed to the training of more than ten endocrinology fellows and multiple junior faculty members, and it continues to be an active focus for our group.

– Guillermo Umpierrez, MD, CDCES  
Emory University, 2022 President of Medicine & Science, ADA



**Anas El Fathi, PhD**  
University of Virginia



**Uta Erdbruegger, MD**  
University of Virginia



**Ankit Gilani, PhD**  
Joan & Sanford I. Weill Medical  
College of Cornell University



**Ivan Jozic, PhD**  
University of Miami



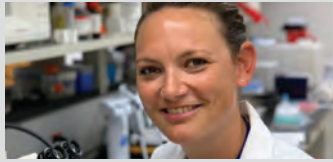
**Jenny Kanter, PhD**  
University of Washington



**Aaron Leong, MD, MSc**  
Massachusetts General  
Hospital



**Orhan Öz, MD, PhD**  
UT Southwestern Medical  
Center at Dallas



**Julia K Panzer, PhD**  
University of Miami School of  
Medicine



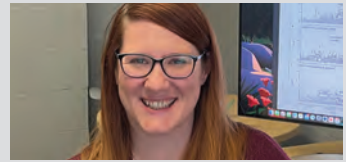
**Udit Parekh, PhD**  
Stanford University School of  
Medicine



**Magdalena Sevilla-  
Gonzalez, PhD**  
Mass General Hospital



**Anu Sharma, MD**  
University of Florida School of  
Medicine



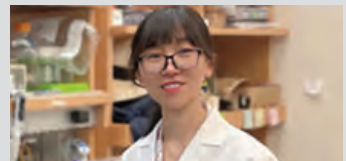
**Cassandra Spracklen, PhD**  
University of Massachusetts  
Amherst



**Yong-Xu Wang, PhD**  
University of Massachusetts  
Medical School



**Yue Wang, PhD**  
Florida State University



**Dongxiang Xue, PhD**  
Joan & Sanford I. Weill Medical  
College of Cornell University

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## Health Disparities Research

These are multi-faceted approaches to prevent health disparities and improve outcomes.



**Rosa Arriaga, PhD**  
*Georgia Institute of Technology*



**Aprill Dawson, PhD**  
*Medical College of Wisconsin*



**Jaclynn Hawkins, PhD**  
*University of Michigan*



**Michelle Litchman, PhD**  
*University of Utah*



**Kelly Palmer, PhD**  
*University of Arizona*

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## Nutrition & Behavioral Health

These projects seek to develop person-centered, yet scalable, dietary and lifestyle interventions with the greatest potential for adoption and maintenance of diabetes-preventing or diabetes-mitigating lifestyles by individuals at greatest risk.



**Samantha Ehrlich, PhD**  
*University of Tennessee*



**Jennifer Falbe, PhD**  
*University of California, Davis*



**Megan Gray, MD**  
*University of Texas at Austin*



**Belinda Lennerz, MD**  
*Boston Children's Hospital*



**Frank Materia, PhD**  
*The Children's Mercy Hospital*



**Josiemer Mattei, PhD**  
*Harvard University*



**Katherine Sauder, PhD**  
*University of Colorado*



**Grace Shearrer, PhD**  
*University of Wyoming*



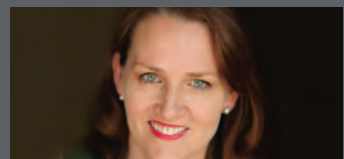
**Brittany Smalls, PhD**  
*University of Kentucky*



**Deirdre Kay Tobias, DSc**  
*Brigham and Women's Hospital*



**Alaina Vidmar, MD**  
*Children's Hospital Los Angeles*



**Windsor Westbrook Sherrill, PhD**  
*Clemson University*





**Mary de Groot, PhD**  
*Indiana University*



**Taressa Frazee, PhD**  
*University of California,  
San Francisco*



**Alona Furmanchuk, PhD**  
*Northwestern University  
Medical School*



**Melissa Santos, PhD**  
*Connecticut Children's Fdn.*



**Janet Snell-Bergeon, PhD**  
*CU Anschutz Medical Center*



**Yuqing Zhang, PhD**  
*University of Cincinnati*



**Katherine Baucom, PhD**  
*University of Utah*



**Nadine Budd Nugent, PhD**  
*Gretchen Swanson Center for  
Nutrition*



**Carolina Casellini, MD**  
*Eastern Virginia Medical  
School*



**Michele Heisler, MD**  
*University of Michigan*



**Lu Hu, PhD**  
*New York University School of  
Medicine*



**James Landay, PhD**  
*Stanford University*



**Wanda Nicholson, MD**  
*University of North Carolina at  
Chapel Hill*



**Natalie Ritchie, PhD**  
*Denver Health and Hospital  
Authority*



**Stephanie Samuels, MD**  
*Yale University School of  
Medicine*



**Laureen Smith, PhD**  
*The Ohio State University*



**Felicia Steger, PhD**  
*University of Kansas Medical  
Center*



**Sarah Stotz, PhD**  
*Colorado School of Public  
Health*



**Holly Willis, PhD**  
*HealthPartners Institute*

# Award Cycles

## SPRING CYCLE

RFA Launch: **April**

Submission Deadline: **June**

Scientific Review: **July–October**

Projected Start Date: **Sept 1 or Nov 1**

## FALL CYCLE

RFA Launch: **September**

Submission Deadline: **November**

Scientific Review: **Nov–May**

Projected Start Date: **April 1–July 1**

\*Cycles contingent on availability of funds.

## PATHWAY CYCLE

RFA Launch: **March**

Submission Deadline: **August**

Scientific Review: **August–November**

Projected Start Date: **December 31**

# Review Process



### Grant Review Panel

Each grant is reviewed by three external panel members. Reviewers are experts in the diabetes field and are carefully selected based on their areas of expertise.



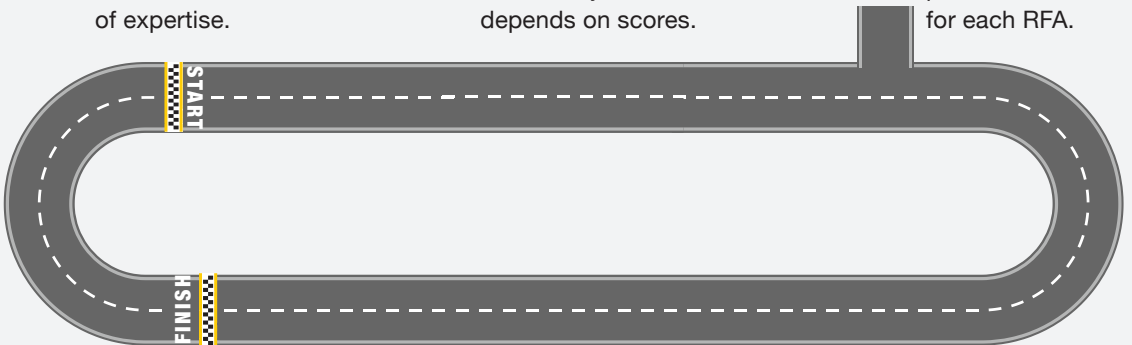
### Review/Score

Reviewers are provided application information and carefully review and score each assigned to them. Preliminary round status depends on scores.



### Finalists

Final round applications will be reviewed by the full review panel selected for each RFA.



### Award

Once final scores are determined, ADA selects the highest ranked applications for funding. At this point, all applicants will be sent final status notifications, including reviewer comments. The number and percentage of applications accepted for funding each round depends on the number of applicants and funds available.



### Notification

All applicants will be notified of their application decision.

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# Mentor Advisory Group

Pathway scientists are selected by a Mentor Advisory Group—an assemblage of eminent scientists from diabetes research and other fields who personify the core elements needed for exceptional science: rigorous thought processes, keen intellect, and the capacity for innovation, creativity, and productivity.

In addition to the selection process, the mentors/advisors will provide ongoing scientific and career advice to Pathway scientists throughout the duration of the awards, creating a challenging and collaborative environment in which transformative science can thrive.



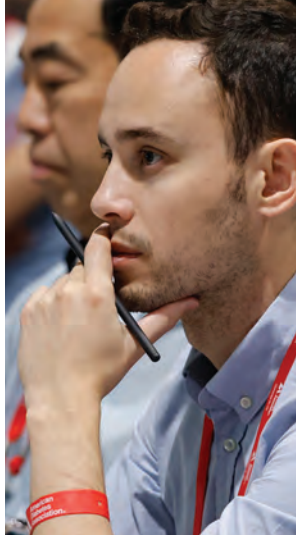
“ADA gave me one of my first research grants. That support set the stage for my work for the next 10 to 15 years, helping me move from basic science to translational research. It also showed me the importance of having mentors. This is why mentorship remains a priority in my career.

– Jane Reusch, MD

*University of Colorado Anschutz Medical Center,  
2022 Research Policy Committee Chair & ADA Mentor*



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## 82<sup>nd</sup> Scientific Sessions

After a two-year hiatus, ADA hosted the 82<sup>nd</sup> Scientific Sessions in New Orleans, LA in June 2022. ADA's Scientific Sessions is the world's premier meeting for diabetes professionals with a broader reach than ever with in-person and hybrid options for attendees. The latest scientific findings in diabetes research, prevention, and care were shared through nearly 900 live presentations, 1,200+ published posters, and 80+ exhibitors, in addition to providing in-person networking opportunities for professionals from 116 countries.

The 82<sup>nd</sup> Scientific Sessions launched with the Pathway Symposium, which highlighted two studies funded by ADA's Pathway to Stop Diabetes<sup>®</sup> research program: Michael L. Stitzel, PhD, The Jackson Laboratory, and Sumita Pennathur, PhD, UC Santa Barbara. Dr. Stitzel's team completed the largest single-cell genomic analysis to date, representing the largest, both in number of cells studied and number of people without diabetes, people with prediabetes, and people with type 2 diabetes. Dr. Pennathur presented on her research towards a painless, minimally invasive, low cost, calibration-free, insulin pump-compatible continuous glucose monitor (CGM), which aims to address the painful, invasive, and cumbersome nature of current products on the market, as well as improved sensitivity needed for real-time insulin dosing.

Several studies at the Scientific Sessions addressed the impact of COVID-19 on the diabetes community. A new study by Jessica L. Harding, PhD, Emory University, found that individuals with diabetes are up to four times more likely to develop long COVID-19—a daunting reminder of

how important scientific research is in changing the health outcomes of people with diabetes.

A major theme at the 82<sup>nd</sup> Scientific Sessions was incretin-based therapies to treat diabetes and obesity, as well as provide kidney protection. Two major trial results were presented with the simultaneous publication of papers in the *New England Journal of Medicine*. Findings from the SURMOUNT-1 trial reported that tirzepatide, a recently approved FDA drug, may be a potential therapeutic option for individuals living with obesity. Trial participants lost 16%–22.5% of their starting weight and lowered their A1C to the range of those without diabetes.


Results from the AWARD-PEDS trial showed that dulglutamide was superior to placebo in improving glycemic control in trial participants ages 10–18. These findings, also published in the *New England Journal of Medicine*, represented a potential breakthrough in the pediatric diabetes space, as cases of type 2 diabetes among youth have more than doubled since the pandemic.

Other studies highlighted the importance of bridging the gap between clinical advances and clinical practice. The work of Alexander Blood, MD, at Brigham and Women's Hospital, reported that only one in six eligible people with diabetes received the recommended therapy to reduce cardiovascular and renal risks. ADA's Overcoming Therapeutic Inertia initiative was created precisely to address these barriers and help promote the adoption and integration of practice guidelines to ensure timely prescription and intensification of therapy as needed.



Other highly anticipated presentations were on diabetes technologies. Boris Kovatchev, PhD, University of Virginia, reported on the real-world data of 20,000+ Control-IQ users with type 1 or type 2 diabetes. These individuals demonstrated an overall improvement with average time in range of 71% after three months on the system. Martin de Bock, MD, Otago University, readout topline results from the six-month CREATE trial, which was the first-ever randomized controlled trial comparing open-source automated insulin delivery device with sensor-augmented pump in 97 participants with T1D. Study results showed that participants on OpenAPS systems had a mean adjusted treatment effect of +3.4 hours/day time in range compared to the define arm (71% vs. 55%), which was encouraging data to provide another treatment option for people with diabetes.

Despite the technology advances, researchers presented that alarmingly severe hypoglycemia persists in people with T1D. Jeremy Pettus, MD, UCSD School of Medicine, reported that despite improvement in glucose management with CGMs, 40% of overall study participants using CGMs did not reach their A1C goal.

The Scientific Sessions also provided a forum to recognize and celebrate individuals whose accomplishments have significantly changed the lives of people with diabetes. The 2022 Banting Medal for Scientific Achievement Award, the highest scientific award of the ADA, was conferred on  Frances Ashcroft, PhD, University of Oxford. Dr. Ashcroft with Professor Andrew Hattersley discovered that KATP channel serves as the molecular link between changes in blood glucose concentration and insulin secretion, and that mutations in KATP channel genes cause neonatal diabetes. This finding has allowed physicians to switch from insulin injections to drug therapy, changing the lives of these individuals.



**Joining Dr. Ashcroft in this celebration were the following 2022 award winners:**

Outstanding Scientific Achievement Award

**Anna L. Gloy, DPhil**

Albert Renold Award

**Jane E. B. Reusch, MD**

Outstanding Achievement in Clinical Diabetes Research Award

**Hertzel C. Gerstein, MD, MSc, FRCPC**

Outstanding Educator in Diabetes Award

**Amy Hess-Fischl, MS, RDN, LDN, BC-ADM, CDCES**

Outstanding Physician-Clinician in Diabetes Award

**Janet B. McGill, MD, MA, FACP**

Kelly West Award for Outstanding Achievement in Epidemiology

**Jill M. Norris, MPH, PhD**



**83<sup>RD</sup> SCIENTIFIC SESSIONS**  
SAN DIEGO | JUNE 23-26

An exciting itinerary is in store with new innovations, such as dynamic panel discussions and debates, interactive Ask the Experts sessions, and audience polling.

# Publications

The publications and reports showcased here represent a sample of the incredible work done by researchers with active grant awards from ADA in 2022. In total, the 2022 ADA researchers contributed more than 595 articles on diabetes in well-respected journals, including *Diabetes*, *Diabetes Spectrum*, *Journal of Clinical Investigation*, *The Journal of the American Medical Association*, and *The Lancet*.

**nature communications**

Article

**A brown fat-enriched adipokine Adissp controls adipose thermogenesis and glucose homeostasis**

Received: 15 July 2022 | Accepted: 20 November 2022

Qingbo Chen<sup>1</sup>, Lei Huang<sup>2</sup>, Dengming Pan<sup>1,3</sup>, Kai Hu<sup>1</sup>, Rui Li<sup>1,4</sup>, Randall H. Friedline<sup>5</sup>, Jason K. Kim<sup>6,7</sup>, Lihua Julie Zhu<sup>8</sup>, David A. Guerin<sup>9</sup> & Yong-Xu Wang<sup>1</sup>

The signaling mechanisms underlying adipose thermogenesis have not been fully elucidated. Particularly, the involvement of adipokines that are selectively expressed in brown adipose tissue (BAT) and beige adipocytes remains to be

EDITORIAL

**Limited Diabetes Education and Resources in American Sign Language**

Michelle L. Litchman<sup>1</sup>, Christopher Moreland<sup>2</sup>, Angela Fagerlin<sup>3,4</sup> and Poorna Kushalnagar<sup>5</sup>

<sup>1</sup>University of Utah College of Nursing, Salt Lake City, UT; <sup>2</sup>Department of Internal Medicine, Dell Medical School at the University of Texas at Austin, Austin, TX; <sup>3</sup>Department of Population Health Science, University of Utah, Salt Lake City, UT; <sup>4</sup>VIA Informatics, Decision-Enhancement and Analytic Sciences (IDEAS) Center for Innovation, Salt Lake City, UT; <sup>5</sup>Center for Deaf Health Equity, Gallaudet University, Washington, DC

ORIGINAL ARTICLE

**A low n-6 to n-3 polyunsaturated hyperinsulinaemia by restoring**

Dominico Trico MD<sup>1</sup>, Alfonso Galderisi M. Sonia Caprio MD<sup>2</sup>, Stephanie Samuels MD<sup>3</sup>, Brittany T. Galuppo BS<sup>3</sup>, Mary Savoye RD<sup>3</sup>, Ariel E. Feldstein MD<sup>3</sup>, Nicola Santoro MD<sup>3</sup>

Journal Pre-proofs

Review

Two Decades of Diabetes Prevention Efforts: A Call to Innovate and Revitalize Our Approach to Lifestyle Change

Iyo Golovaty, Natalie D. Ritchie, Jaakko Tuomi, V. Mohan, M.K. Ah, E.W. Gregg, M. Mohammed K. Al, Edward W. Gregg, Michael Bergman, Tamaz Moin

DOI: <https://doi.org/10.1016/j.diabetes.2022.110195>

Reference: DIAB 110195

To appear in: *Diabetes Research and Clinical Practice*

Received Date: 26 July 2022  
Revised Date: 7 November 2022  
Accepted Date: 28 November 2022

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Journal of the Endocrine Society, 2022, 4, 1-4

**The Use of Ceramides to Predict Metabolic Response to Metformin in Women With PCOS**

Anu Sharma, Benjamin Krick, Ying Li, Scott A. Summers, Mary C. Playdon, and Corrine Welt

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nature metabolism

Article

**Pharmacological targeting of neurons within the brain reduces**

Received: 23 September 2021 | Accepted: 4 October 2022

Mark Schneeburger<sup>1,2,3,4</sup>, Jordan T. Shukla<sup>1,2</sup>, Keith Douglas W. Barrow<sup>1,2</sup>, Victoria M. Mulligan<sup>1,2</sup>, Daniel F. Barker<sup>1,2</sup>, Angelica Nicolea Renier<sup>1,2</sup>, Paul C. Jeffrey M. Friedman<sup>1,2</sup>

SCIENCE ADVANCES | RESEARCH ARTICLE

**Diabetic hyperglycemia promotes primary tumor progression through glycation-induced tumor extracellular matrix stiffening**

Wenjun Wang<sup>1</sup>, Lauren A. Hapach<sup>2,3</sup>, Lauren Griggs<sup>3</sup>, Kyra Smart<sup>3</sup>, Yueheng Wu<sup>1</sup>, Paul V. Tauler<sup>1</sup>, Matthew M. Rowe<sup>1</sup>, Katherine M. Young<sup>1</sup>, Madison E. Bates<sup>1</sup>, Andrew C. Johnson<sup>1</sup>, Nicholas J. Ferris<sup>1</sup>, Ambre Pozar<sup>1</sup>, Cynthia A. Reinhart-King<sup>1,4</sup>

Diabetes mellitus is a complex metabolic disorder that is associated with an increased risk of breast cancer. Despite this correlation, the interplay between tumor progression and diabetes, particularly with regard to stiffening of the extracellular matrix, is still mechanistically unclear. Here, we established a murine model where hyperglycemia was induced before breast tumor development. Using the murine model, in vitro systems, and patient samples, we show that hyperglycemia increases tumor growth, extracellular matrix stiffness, glycation, and epithelial-mesenchymal transition of tumor cells. Upon inhibition of glycation or mechanotransduction in diabetic mice, these same metrics are reduced to levels comparable with nondiabetic tumors. Together, our study describes a novel biomechanical mechanism by which diabetic hyperglycemia promotes breast tumor progression via glycating the extracellular matrix. In addition, our work provides evidence that glycation inhibitors is a potential adjuvant therapy for diabetic cancer patients due to the key role of matrix stiffening in both diseases.

Article

**Whole-genome sequencing reveals host factors underlying critical COVID-19**

Received: 2 September 2021 | Accepted: 23 February 2022

Athanasios Koutroubas<sup>1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100,101,102,103,104,105,106,107,108,109,110,111,112,113,114,115,116,117,118,119,120,121,122,123,124,125,126,127,128,129,130,131,132,133,134,135,136,137,138,139,140,141,142,143,144,145,146,147,148,149,150,151,152,153,154,155,156,157,158,159,160,161,162,163,164,165,166,167,168,169,170,171,172,173,174,175,176,177,178,179,180,181,182,183,184,185,186,187,188,189,190,191,192,193,194,195,196,197,198,199,200,201,202,203,204,205,206,207,208,209,210,211,212,213,214,215,216,217,218,219,220,221,222,223,224,225,226,227,228,229,230,231,232,233,234,235,236,237,238,239,240,241,242,243,244,245,246,247,248,249,250,251,252,253,254,255,256,257,258,259,260,261,262,263,264,265,266,267,268,269,270,271,272,273,274,275,276,277,278,279,280,281,282,283,284,285,286,287,288,289,290,291,292,293,294,295,296,297,298,299,300,301,302,303,304,305,306,307,308,309,310,311,312,313,314,315,316,317,318,319,320,321,322,323,324,325,326,327,328,329,330,331,332,333,334,335,336,337,338,339,340,341,342,343,344,345,346,347,348,349,350,351,352,353,354,355,356,357,358,359,360,361,362,363,364,365,366,367,368,369,370,371,372,373,374,375,376,377,378,379,380,381,382,383,384,385,386,387,388,389,390,391,392,393,394,395,396,397,398,399,400,401,402,403,404,405,406,407,408,409,410,411,412,413,414,415,416,417,418,419,420,421,422,423,424,425,426,427,428,429,430,431,432,433,434,435,436,437,438,439,440,441,442,443,444,445,446,447,448,449,450,451,452,453,454,455,456,457,458,459,460,461,462,463,464,465,466,467,468,469,470,471,472,473,474,475,476,477,478,479,480,481,482,483,484,485,486,487,488,489,490,491,492,493,494,495,496,497,498,499,500,501,502,503,504,505,506,507,508,509,510,511,512,513,514,515,516,517,518,519,520,521,522,523,524,525,526,527,528,529,530,531,532,533,534,535,536,537,538,539,540,541,542,543,544,545,546,547,548,549,550,551,552,553,554,555,556,557,558,559,560,561,562,563,564,565,566,567,568,569,570,571,572,573,574,575,576,577,578,579,580,581,582,583,584,585,586,587,588,589,590,591,592,593,594,595,596,597,598,599,600,601,602,603,604,605,606,607,608,609,610,611,612,613,614,615,616,617,618,619,620,621,622,623,624,625,626,627,628,629,630,631,632,633,634,635,636,637,638,639,640,641,642,643,644,645,646,647,648,649,650,651,652,653,654,655,656,657,658,659,660,661,662,663,664,665,666,667,668,669,670,671,672,673,674,675,676,677,678,679,680,681,682,683,684,685,686,687,688,689,690,691,692,693,694,695,696,697,698,699,700,701,702,703,704,705,706,707,708,709,710,711,712,713,714,715,716,717,718,719,720,721,722,723,724,725,726,727,728,729,730,731,732,733,734,735,736,737,738,739,740,741,742,743,744,745,746,747,748,749,750,751,752,753,754,755,756,757,758,759,760,761,762,763,764,765,766,767,768,769,770,771,772,773,774,775,776,777,778,779,780,781,782,783,784,785,786,787,788,789,790,791,792,793,794,795,796,797,798,799,800,801,802,803,804,805,806,807,808,809,810,811,812,813,814,815,816,817,818,819,820,821,822,823,824,825,826,827,828,829,830,831,832,833,834,835,836,837,838,839,840,841,842,843,844,845,846,847,848,849,850,851,852,853,854,855,856,857,858,859,860,861,862,863,864,865,866,867,868,869,870,871,872,873,874,875,876,877,878,879,880,881,882,883,884,885,886,887,888,889,890,891,892,893,894,895,896,897,898,899,900,901,902,903,904,905,906,907,908,909,910,911,912,913,914,915,916,917,918,919,920,921,922,923,924,925,926,927,928,929,930,931,932,933,934,935,936,937,938,939,940,941,942,943,944,945,946,947,948,949,950,951,952,953,954,955,956,957,958,959,960,961,962,963,964,965,966,967,968,969,970,971,972,973,974,975,976,977,978,979,980,981,982,983,984,985,986,987,988,989,990,991,992,993,994,995,996,997,998,999,1000</sup>

Recessive Genome-Wide Meta-analysis of Genetic Architecture of Type 2 Diabetes

Mark J. O'Connor<sup>1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100,101,102,103,104,105,106,107,108,109,110,111,112,113,114,115,116,117,118,119,120,121,122,123,124,125,126,127,128,129,130,131,132,133,134,135,136,137,138,139,140,141,142,143,144,145,146,147,148,149,150,151,152,153,154,155,156,157,158,159,160,161,162,163,164,165,166,167,168,169,170,171,172,173,174,175,176,177,178,179,180,181,182,183,184,185,186,187,188,189,190,191,192,193,194,195,196,197,198,199,200,201,202,203,204,205,206,207,208,209,210,211,212,213,214,215,216,217,218,219,220,221,222,223,224,225,226,227,228,229,230,231,232,233,234,235,236,237,238,239,240,241,242,243,244,245,246,247,248,249,250,251,252,253,254,255,256,257,258,259,260,261,262,263,264,265,266,267,268,269,270,271,272,273,274,275,276,277,278,279,280,281,282,283,284,285,286,287,288,289,290,291,292,293,294,295,296,297,298,299,300,301,302,303,304,305,306,307,308,309,310,311,312,313,314,315,316,317,318,319,320,321,322,323,324,325,326,327,328,329,330,331,332,333,334,335,336,337,338,339,340,341,342,343,344,345,346,347,348,349,350,351,352,353,354,355,356,357,358,359,360,361,362,363,364,365,366,367,368,369,370,371,372,373,374,375,376,377,378,379,380,381,382,383,384,385,386,387,388,389,390,391,392,393,394,395,396,397,398,399,400,401,402,403,404,405,406,407,408,409,410,411,412,413,414,415,416,417,418,419,420,421,422,423,424,425,426,427,428,429,430,431,432,433,434,435,436,437,438,439,440,441,442,443,444,445,446,447,448,449,450,451,452,453,454,455,456,457,458,459,460,461,462,463,464,465,466,467,468,469,470,471,472,473,474,475,476,477,478,479,480,481,482,483,484,485,486,487,488,489,490,491,492,493,494,495,496,497,498,499,500,501,502,503,504,505,506,507,508,509,510,511,512,513,514,515,516,517,518,519,520,521,522,523,524,525,526,527,528,529,530,531,532,533,534,535,536,537,538,539,540,541,542,543,544,545,546,547,548,549,550,551,552,553,554,555,556,557,558,559,560,561,562,563,564,565,566,567,568,569,570,571,572,573,574,575,576,577,578,579,580,581,582,583,584,585,586,587,588,589,590,591,592,593,594,595,596,597,598,599,600,601,602,603,604,605,606,607,608,609,610,611,612,613,614,615,616,617,618,619,620,621,622,623,624,625,626,627,628,629,630,631,632,633,634,635,636,637,638,639,640,641,642,643,644,645,646,647,648,649,650,651,652,653,654,655,656,657,658,659,660,661,662,663,664,665,666,667,668,669,670,671,672,673,674,675,676,677,678,679,680,681,682,683,684,685,686,687,688,689,690,691,692,693,694,695,696,697,698,699,700,701,702,703,704,705,706,707,708,709,710,711,712,713,714,715,716,717,718,719,720,721,722,723,724,725,726,727,728,729,730,731,732,733,734,735,736,737,738,739,740,741,742,743,744,745,746,747,748,749,750,751,752,753,754,755,756,757,758,759,760,761,762,763,764,765,766,767,768,769,770,771,772,773,774,775,776,777,778,779,780,781,782,783,784,785,786,787,788,789,790,791,792,793,794,795,796,797,798,799,800,801,802,803,804,805,806,807,808,809,810,811,812,813,814,815,816,817,818,819,820,821,822,823,824,825,826,827,828,829,830,831,832,833,834,835,836,837,838,839,840,841,842,843,844,845,846,847,848,849,850,851,852,853,854,855,856,857,858,859,860,861,862,863,864,865,866,867,868,869,870,871,872,873,874,875,876,877,878,879,880,881,882,883,884,885,886,887,888,889,890,891,892,893,894,895,896,897,898,899,900,901,902,903,904,905,906,907,908,909,910,911,912,913,914,915,916,917,918,919,920,921,922,923,924,925,926,927,928,929,930,931,932,933,934,935,936,937,938,939,940,941,942,943,944,945,946,947,948,949,950,951,952,953,954,955,956,957,958,959,960,961,962,963,964,965,966,967,968,969,970,971,972,973,974,975,976,977,978,979,980,981,982,983,984,985,986,987,988,989,990,991,992,993,994,995,996,997,998,999,1000</sup>

**Navigating Diabetes Online Communities in Clinical Practice**

Meghan McLarney, MS, RDN, LMNT, CNSC, CDCES<sup>1</sup>, Michelle L. Litchman, PhD, FNP-BC, CDCES, FAANP<sup>2</sup>, Deborah Greenwood, PhD, RN, BC-ADM, CDCES, FADEA<sup>3</sup>, and Andjela Drincic, MD, FACP<sup>4</sup>

DATE OF DOCUMENT: February 6, 2023

**CURRICULUM VITAE**

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**BIBLIOGRAPHY**

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ELSEVIER

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**Heterogeneity of Diabetes:  $\beta$ -Cells, Phenotypes, and Precision Medicine: Proceedings of an International Symposium of the Canadian Institutes of Health Research's Institute of Nutrition, Metabolism and Diabetes and the U.S. National Institutes of Health's National Institute of Diabetes and Digestive and Kidney Diseases**

William F. Cryan<sup>1</sup>, Dana K. Anderson<sup>2</sup>, Guillermo Aronow-Rubin<sup>3</sup>, Christopher J. Fox<sup>4</sup>, Sheryl Lee<sup>5</sup>, E. Bruce Sirovica<sup>6</sup>, Andrew Weil<sup>7</sup>, and Norman D. Rosenblum<sup>1,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100,101,102,103,104,105,106,107,108,109,110,111,112,113,114,115,116,117,118,119,120,121,122,123,124,125,126,127,128,129,130,131,132,133,134,135,136,137,138,139,140,141,142,143,144,145,146,147,148,149,150,151,152,153,154,155,156,157,158,159,160,161,162,163,164,165,166,167,168,169,170,171,172,173,174,175,176,177,178,179,180,181,182,183,184,185,186,187,188,189,190,191,192,193,194,195,196,197,198,199,200,201,202,203,204,205,206,207,208,209,210,211,212,213,214,215,216,217,218,219,220,221,222,223,224,225,226,227,228,229,230,231,232,233,234,235,236,237,238,239,240,241,242,243,244,245,246,247,248,249,250,251,252,253,254,255,256,257,258,259,260,261,262,263,264,265,266,267,268,269,270,271,272,273,274,275,276,277,278,279,280,281,282,283,284,285,286,287,288,289,290,291,292,293,294,295,296,297,298,299,300,301,302,303,304,305,306,307,308,309,310,311,312,313,314,315,316,317,318,319,320,321,322,323,324,325,326,327,328,329,330,331,332,333,334,335,336,337,338,339,340,341,342,343,344,345,346,347,348,349,350,351,</sup>

**JCI INSIGHT**  
**Evidence of Islet CADM1-mediated immune cell interactions during human type 1 diabetes**  
 Chandan Sona, Laszlo Nagy, Matthew N. Poy  
 JCI Insight 2022;7(1):19138. <https://doi.org/10.1126/jci.insight.19138>

**nutrients** **MDPI**  
 Article  
**Breakfast Consumption May Improve Fasting Insulin, HOMA-IR, and HbA1c Levels in Predominately Low-Income, Hispanic Children 7–12 Years of Age**  
 Matthew R. Jeans<sup>1</sup>, Sarweena Vandyoussefi<sup>2</sup>, Matthew J. Lundy<sup>3</sup>, Heather J. Leidy<sup>4</sup>, Megan J. Gray<sup>5</sup>, Molly S. Bray<sup>6</sup>, Elizabeth M. Widen<sup>7</sup>, and Jamie N. Davis<sup>1,8</sup>

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- Department of Nutrition, Johns Hopkins University, Baltimore, MD 21205, USA

**frontiers** **Frontiers in Physiology**  
 OPEN ACCESS  
**Modulation of Gap Junction Coupling Within the Islet of Langerhans During the Development of Type 1 Diabetes**  
 Niko L. Farnsworth<sup>1</sup>, Robert A. Puccio<sup>2</sup>, Wolfgang E. Schliesser<sup>3</sup>, David G. Remer<sup>4</sup>, Jane G. Minetti<sup>5</sup>, and Richard K. R. Bertram<sup>1,6</sup>

**OPEN ACCESS**  
 KEYWORDS: Type 1 Diabetes Mellitus, Islet Dysfunction, Insulin Secretion, Glucose Homeostasis, Pancreatic Islet, Gap Junctions, Electrical Coupling, Protein, Glucagon-Like Peptide-1, Insulin, Glucose, Diabetes Mellitus

**WILEY**  
**High saturated fatty acid ratio diet improves insulin clearance in obese youth**  
 MD<sup>1</sup> | Michelle A. Van Name MD<sup>2</sup> | J. Pope<sup>3</sup>, Zhongyao Li RD<sup>3</sup>, Andrea Mari PhD<sup>4</sup>

**Journal of Neurochemistry**  
**Role of glutamatergic system for weight**  
 Nicola L. Brice<sup>1,2</sup>, Kyle Pellegrino<sup>1,2</sup>, Luca Parolari<sup>1,2</sup>, J. Pope<sup>3</sup>, Françoise Marchalain<sup>4,5</sup>, Emma S. Carroll<sup>6</sup>, Thomas Topilko<sup>7</sup>, Bert Neuman<sup>8</sup>, Kevin Doyle<sup>9</sup>, Roland Bürl<sup>10</sup>, Julia Glin<sup>11</sup>, Maria José Oriáño<sup>12</sup>, Alexander R. Neclow<sup>13</sup>, Steven P. Mack<sup>14</sup>, Mark Carlton<sup>15</sup>, Nathaniel Heintz<sup>16</sup>

**Diabetes** Volume 71 March 2022  
**Insulin illuminates**

**Journal of Internal Medicine**  
**Insulin illuminates**  
 María Cortés-Sánchez<sup>1</sup>, J. Pope<sup>2</sup>, Karim Kaur<sup>3,4,5</sup>, Carsten F. Rundsten<sup>6,7</sup>, Aaron Leong<sup>1,2,3,4,5,8,9,10</sup>

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**BMC Pediatrics**  
**RESEARCH**  
**“Struggle at night – He doesn’t let me sleep sometimes”: a qualitative analysis of sleeping habits and routines of Hispanic toddlers at risk for obesity**  
 Megan J. Gray<sup>1</sup>, Christian E. Yaquez<sup>2</sup> and Ojasvya Aguiñol<sup>1</sup>

**JCI INSIGHT** **RESEARCH ARTICLE**  
**CFTR-mediated monocyte/macrophage dysfunction revealed by cystic fibrosis proband-parent comparisons**  
 Xi Zhang<sup>1</sup>, Camille M. Moore<sup>2</sup>, Laura D. Harnack<sup>3</sup>, Joanne Domenico<sup>4</sup>, Vittalba Ravikha Rangaraj<sup>5</sup>, Justin E. Ideozu<sup>6</sup>, Jennifer R. Knapp<sup>7</sup>, Katherine J. Woods<sup>8</sup>, Stephanie Jump<sup>9</sup>, Shuang Jia<sup>10</sup>, Jeremy W. Prokop<sup>11</sup>, Russell Bowler<sup>12</sup>, Martin J. Hessner<sup>13</sup>, Erwin W. Celfand<sup>14</sup>, and Hara Levy<sup>15</sup>

**cmgh** **CELLULAR AND MOLECULAR GASTROENTEROLOGY AND HEPATOLOGY**  
**EDITORIAL**  
**Hepatocentric Leptin Signaling Modulates Liponeogenesis via MKP-3**  
 Since its discovery in 1994, leptin has been recognized as a satiety hormone required for body weight homeostasis. Leptin is secreted predominantly by white adipose tissue, and its levels in blood are correlated positively with the amount of body fat. Extensive studies of leptin's actions in the central nervous system (CNS) have shown its ability to control food intake and energy expenditure. However, despite the profound obesity and diabetes resulting from homozygous loss of leptin or its receptor, there has been very limited efficacy of leptin treatment for obesity because most obese individuals already have high circulating leptin levels, rendering them unresponsive to its weight-reducing effects. Research now has shifted to leptin's effects in the periphery, particularly in the context of its glucoendocrine actions, where it may have a role independent of body weight regulation. Indeed, hyperinsulinemia occurs before weight gain in leptin-deficient *ob/ob* mice, and there are significant improvements in hyperglycemia and hyperinsulinemia data from the same research group showed that mitogen-activated protein kinase phosphatase-3 (MKP-3) is increased significantly in the liver of diet-induced obese mice and has regulatory control over glucoendocrine. They showed that MKP-3 dephosphorylates forkhead box protein O1 (FoxO1) to promote its nuclear translocation, subsequently inducing the transcription of glucoendocrine genes. The investigators now show that leptin and *Obrr* overexpression in the presence of leptin significantly decreases MKP-3 protein levels in primary hepatocytes and in mice, whereas *Obrr* suppression in primary hepatocytes increases MKP-3. Moreover, *Mkp-3* deficiency blocks the ability of leptin and *Obrr* overexpression to suppress glucose production and glucoendocrine gene expression, showing that MKP-3 mediates the effects of leptin signaling on hepatic glucoendocrine (Figure 1).

**JAMA Network Open**  
**Invited Commentary | Health Policy**  
**The Future of Behavioral Health—Harnessing the Potential of Psychiatric Mental Health Nurse Practitioners**  
 Lirio Marchi, PhD, MPH, Teresa E. Hoare, PhD

The toll of mental illness in the US is substantial in 5 adults with a mental illness. As the population ages, greater numbers of individuals will need care for the comorbidities associated with older age and their mental health needs. There is a lack of mental health services, resources, and access to clinicians who can provide high-quality behavioral health services will become paramount to achieving population health. Shortages in the behavioral health workforce have been noted for years. Primary care clinicians experience difficulty securing mental health referrals for their patients, requiring an already stretched primary care workforce to care for complex mental health needs. This problem is compounded by an uneven geographic distribution of specialty mental health clinicians, especially in rural areas where a primary care clinician might be the only clinician providing care. One of our examined changes in the number of psychiatric and psychiatric mental health nurse practitioners (PMHNPs) billing Medicare from 2015 to 2019. Linking data from all clinicians who have a National Provider Identification number with Medicare claims, they found that the total number of PMHNPs increased by 134.1% compared with 14.9% for psychiatrists. The number of psychiatrists billing Medicare decreased, and the number of PMHNPs held steady. It is unclear what is driving

**frontiers** **Frontiers in Psychology**  
**OPEN ACCESS**  
**Brief report of protective factors associated with family and parental well-being during the COVID-19 pandemic in an outpatient child and adolescent psychiatric clinic**  
 Tamaki Hosoda Urban<sup>1</sup>, Deborah Friedman, Maysa Marwan Kaskas, Alessandra J. Caruso, Katia M. Canenguez, Nancy Rotter, Janet Wozniak and Archana Basu

**npi** **genomic medicine** **www.nature.com/npgenmed**  
**BRIEF COMMUNICATION** **OPEN**  
**A dominant negative *ADIPOQ* mutation in a diabetic family with renal disease, hypoadiponectinemia, and hyperceramidemia**  
 Christopher A. Simone<sup>1,2,3,4</sup>, Joseph L. Wilkerson<sup>5,6</sup>, Arnelise M. Poss<sup>7</sup>, James A. Banks<sup>8</sup>, Joseph V. Varre<sup>9</sup>, Jose Lazaro Guevara<sup>10</sup>, Edgar Javier Hernandez<sup>11</sup>, Bushra Gorsi<sup>12</sup>, Donald L. Atkinson<sup>13</sup>, Turun Turapov<sup>14</sup>, Scott G. Frodsham<sup>15</sup>, Julio C. Pierno Morales<sup>16</sup>, Kristina O'Hall<sup>17</sup>, Barry Moore<sup>18</sup>, Mark Yandell<sup>19</sup>, Scott A. Summers<sup>20</sup>, Andrej S. Kolesovsk<sup>21</sup>, William L. Holland<sup>22</sup>, and Marcus G. Prezelius<sup>23,24,25</sup>

**Correspondence**  
**Free Şebnem Korur Fincancı and end systemic silencing of health professionals**  
 On Oct 26, 2022, as part of a mourning crowd on human rights and of the medical profession specifically, the Turkish Government deposed our colleague and friend, Şebnem Korur Fincancı. Fincancı is a globally renowned forensic physician who in the past 30 years has worked to ensure the full and objective documentation by forensic physicians of evidence of torture and ill treatment. In the face of threats allegations that chemical weapons had been used, an act that was fully in-line with internationally accepted best practices. By attacking Fincancı's freedom of expression and professional conduct, the Turkish Government is attempting to stifle the practice of evidence-based medicine and civil rights as a whole. Fincancı has long been an internationally recognized forensic physician who in the past 30 years has worked to ensure the full and objective documentation by forensic physicians of evidence of torture and ill treatment. In the face of threats all 11 Central Council members of the TMA, including Fincancı, to prison for the crime of publishing the public health dangers of war. Their brief statement had noted the adverse health consequences of all armed conflicts and the ethical responsibility of doctors to "defend life and commit to maintain the environment of peace". In the statement, these clinicians were charged with "providing the public to hatred and enmity" and "making terrorism propaganda". Fincancı was then sentenced for 2.5 years in prison for her involvement in that work.

**The Journal of Clinical Investigation** **RESEARCH ARTICLE**  
**Hepatic FoxOs link insulin signaling with plasma lipoprotein metabolism through an apolipoprotein M/sphingosine-1-phosphate pathway**  
 Maria Concepción Izquierdo<sup>1</sup>, Niroshan Shamuganrajah<sup>2</sup>, Samuel X. Lee<sup>3</sup>, Michael J. Kraakman<sup>4</sup>, Mariel Westertrop<sup>5</sup>, Takumi Kitamoto<sup>6</sup>, Michael Harris<sup>7</sup>, Joshua R. Cook<sup>8</sup>, Galina A. Gerasimova<sup>9</sup>, Kenia Zhang<sup>10</sup>, Elijah Marbury<sup>11</sup>, Hong D. Sullivan<sup>12</sup>, Mikhaela Ramirez<sup>13</sup>, Stefania Cavatoni<sup>14</sup>, Terry G. DiLuzio<sup>15</sup>, Barry E. Hanrahan<sup>16</sup>, and Rebecca A. Heiser<sup>17</sup>

**International Journal of Environmental Research and Public Health** **MDPI**  
**Article**  
**Using Path Analysis and Linear Regression to Test for Gender and Participation: Effects in a Culturally Tailored Diabetes Intervention for Latino Adults**  
 Jaelynn Hawkins<sup>1</sup>, Edith C. Kieffer<sup>2</sup>, Brandy Sines<sup>3</sup>, Greichen Platt<sup>4</sup>, Lenette Jones<sup>5</sup>, Jamie Mitchell<sup>6</sup>, Nicolaus Espitia<sup>7</sup>, Alana Lebron<sup>8</sup>, Katherine A. Kloss<sup>9</sup>, Katie Kurnick<sup>10</sup>, Gloria Palmisano<sup>7</sup>, and Michael S. Spencer<sup>11</sup>

# Milestones in Diabetes Research

**April 2, 1940**

Diabetes care has changed significantly since ADA was founded in 1940, with new medicines, devices, and technologies emerging practically every year. Over the same time period, people with diabetes have proved they're capable of amazing things, refusing to be defined by their diabetes, and continually pushing for better tools, care, and medicines.



**1941**

ADA host the first annual Scientific Sessions.



**1<sup>ST</sup> SCIENTIFIC SESSIONS**

**1963**

The first wearable insulin pump, which delivers both insulin and glucagon, is developed. At this point, the pump's still a prototype—it's the size of a large backpack.



**1981**

The first at-home blood glucose monitor becomes available.



**1973**

A1C test developed.



**1940s**

**1950s**

**1960s**

**1970s**

**1980s**



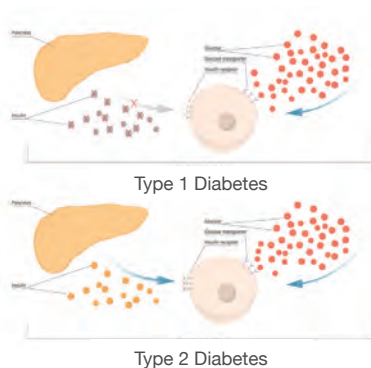
**1952**

ADA funds its first research grants.



**1966**

The first successful pancreas transplant is performed.



**1959**

Distinction between type 1 and type 2 diabetes established.



**1964**

The Ames Company introduces Dextrostix, the first test strips that use a drop of blood to measure glucose levels, providing real-time information about blood glucose levels.





**1993**  
Diabetes Control & Complications Trial results spurs interest in developing devices to manage glucose control.



**1999/2000**  
Edmonton Protocol study, led by James Shapiro, MD, PhD, and others, suggests islet replacement therapy can free people with T1D from daily insulin injections fueling cell-based therapy development.



**2014**  
*NEJM* study reports significant reduction in diabetes complications due to clinical advances.



**2022**  
FDA approves first drug shown to delay T1D.



**80s**      **1990s**      **2000s**      **2010s**      **2020s**



**1999**  
First Safe at School® law passes to create a safer environment for kids with diabetes.



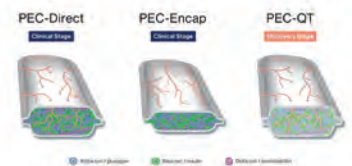
**1989**  
ADA publishes first *Standards of Medical Care in Diabetes*.



**2002**  
U.S. Diabetes Prevention study results reinforce earlier data showing how a healthy lifestyle can reduce risk of diabetes.

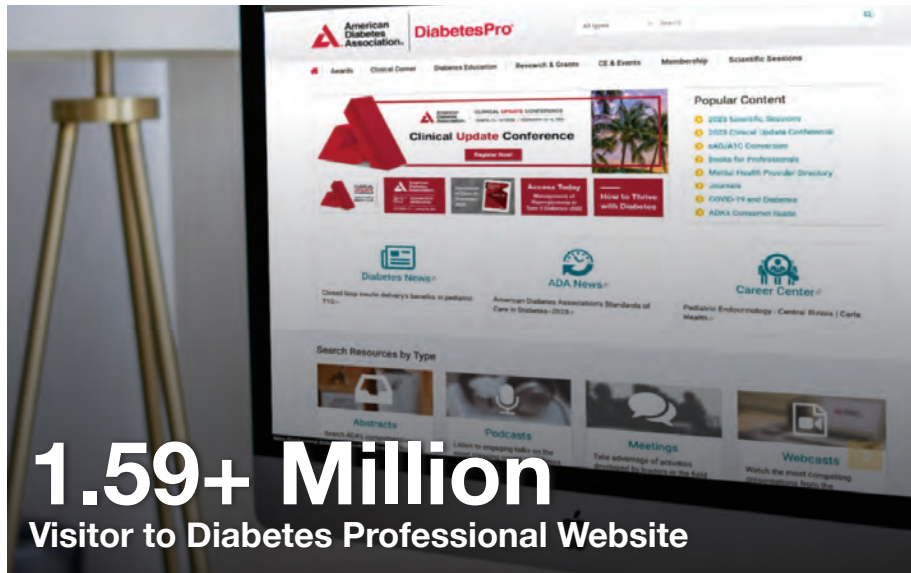


**2015 - now**  
Diabetes technologies ease disease management and improve glycemic control.



**2018 - now**  
Multiple biotech/pharma companies enter clinical trials with islet replacement therapies to “cure” diabetes.

# By the Numbers



**1.59+ Million**  
Visitor to Diabetes Professional Website



**119,407**  
Social Media Followers  
on ADA Professional  
Channels



**1,200+**  
Published Posters  
at 82<sup>nd</sup> SciSessions



**116**  
Countries  
at 82<sup>nd</sup> SciSessions



**~900**  
Live Presentations  
at 82<sup>nd</sup> SciSessions



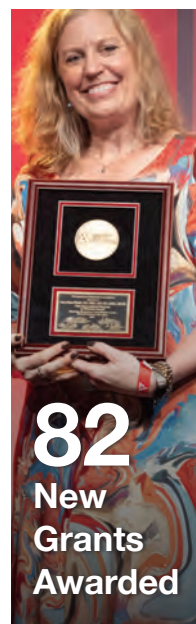
**11,000**  
In-person Attendees  
at 82<sup>nd</sup> SciSessions



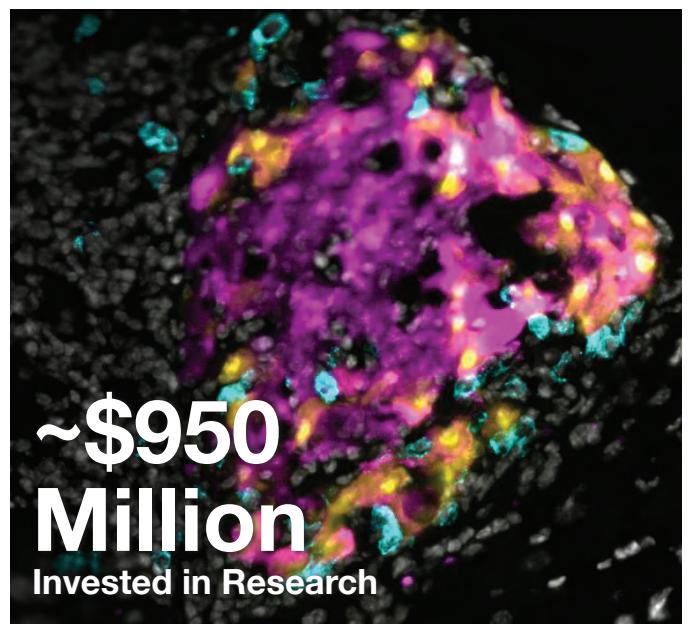
**140+**  
Active  
Research  
Grants



**85+**  
Invited Presentations  
by ADA Grantees



**82**  
New  
Grants  
Awarded



**~\$950  
Million**  
Invested in Research



“ADA funded the first clinical research study I designed to unveil the role of cardiovascular autonomic dysfunction and oxidative stress pathways as mechanisms driving higher the cardiovascular risk in diabetes. Funding was crucial in acquiring sound evidence that enabled my future success in acquiring independent funding from the National Institutes of Health and other organizations.

– Rodica Pop-Busui, MD, PhD  
University of Michigan  
2023 President of Medicine & Science, ADA

