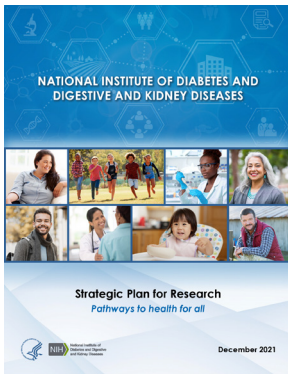


NIDDK Recent Advances & Emerging Opportunities: 2022

Here is a snapshot of the immense body of NIDDK-funded research and recent research activities including scientific advances and personal perspectives of those who have given time and effort to participate in clinical research. *More information can be found within the full online report.*



NIDDK Strategic Plan for Research

The NIDDK's new Strategic Plan will accelerate research to understand, prevent, and treat diseases within its mission and advance health equity. The unifying theme of the Strategic Plan is *multidisciplinary researchers, diverse stakeholders, pathways to health for all*. The Strategic Plan is available on NIDDK's website.

| Cross-Cutting Science

Gaining Insight into Severe Complications from COVID-19

- ▶ Research reveals multiple mechanisms by which SARS-CoV-2 infection can influence the development and course of organ damage and disease—including diabetes, liver injury, and kidney injury—yielding potential targets for therapeutic intervention.

| Diabetes, Endocrinology, and Metabolic Diseases

- ▶ Clinical trial results showed that a next-generation artificial pancreas device—technology that automatically links glucose monitoring and insulin delivery—outperformed a commercially available device in helping adolescents and young adults with type 1 diabetes keep their blood glucose (sugar) levels in a healthy range. Improving type 1 diabetes management technologies could help people achieve recommended blood glucose levels with less burden.
- ▶ New research has also uncovered genetic variations that predispose people to adverse metabolic side effects of commonly prescribed steroid hormones called glucocorticoids.

Reflecting upon her experience in the Treatment Options for Type 2 Diabetes in Adolescents and Youth (TODAY) trial, Kathrine expresses extreme gratitude:

“ *TODAY didn't complete me. It complemented me. It gave me the tools to be a better me.* ”

Jenae explains why she and her husband, Rod, enrolled their daughter, Katelyn, in The Environmental Determinants of Diabetes in the Young (TEDDY) study:

“ *We just felt like ... we can be helpful, and if she ever gets diabetes, they're going to find it faster.* ”



NIDDK Director Dr. Griffin P. Rodgers' Guiding Principles:

Maintain a vigorous investigator-initiated research portfolio

Support pivotal clinical studies and trials

Promote a steady and diverse pool of talented new investigators

Foster exceptional research training and mentoring opportunities

Ensure knowledge through outreach and communications

Kidney, Urologic, and Hematologic Diseases



U.S. Department of Health and Human Services
National Institutes of Health
National Institute of Diabetes & Digestive & Kidney Diseases

- ▶ Researchers identified a potential new blood-based biomarker of human kidney function and disease prognosis. These findings may lead to new clinical tools for assessing kidney health and decline that could be a significant improvement over and/or in addition to current methods.
- ▶ New research shows that the migration of blood stem cells from bone marrow into the bloodstream is influenced by nociceptive nerves. This study may lead to new strategies to improve the yield of blood stem cells needed for stem cell-based clinical protocols.
- ▶ In times of challenge such as the current COVID-19 pandemic, teamwork, support, and flexibility among study volunteers, staff, and investigators have been especially important to moving clinical research forward. For successful clinical research, study coordinators have key responsibilities. For example, Brittney, a study coordinator working with kids and parents in the Prevention of Urinary Stones with Hydration (PUSH) clinical trial, says she constantly sought out ways **“to prevent having any barriers or burdens ... on the parents as much as possible.”** Another PUSH study coordinator, Holly, says **“Being a prevention study, we want it to be a positive experience for them.”**

RESEARCH IS A MARATHON, NOT A SPRINT:

A long-term investment in basic, translational, and clinical research by NIDDK and others provided foundational discoveries for the first FDA-approved treatment for primary hyperoxaluria type 1—a rare, inherited, metabolic condition characterized by recurrent kidney stones. This advance will greatly improve the prognosis of individuals with this disease.

Digestive Diseases and Nutrition

- ▶ Two studies of designer foods show the promise for helping to address disparate public health challenges:
 - A dietary supplement containing ingredients from locally available, nutrient-dense foods provided to malnourished children greatly improved growth and markers of development.
 - Fiber-containing snacks consumed by overweight or obese participants promoted gut microbiome shifts and indicators of beneficial effects on host metabolism and immune function.
- ▶ Animal models infected with different hepatitis C viral subtypes, including a drug-resistant one, responded well to a combination treatment of a new drug called fluoxazolevir together with approved hepatitis C drugs. This could represent the next generation of hepatitis C treatments, with benefits such as shorter treatment length, improved response across viral subtypes, and lower chance of developing viral drug resistance.

Ben, who participated in the Predicting Response to Standardized Pediatric Colitis Therapy (PROTECT) study of ulcerative colitis (UC) treatment, says:



Although I was really young when I was diagnosed with UC and participated in the PROTECT study, I would recommend that others participate in research studies if they have the opportunity.”

Obesity

- ▶ Researchers have identified succinate, a molecule produced through metabolism, as a signal that triggers muscle remodeling and strength-building in response to exercise in mice and humans. Future research could explore whether dietary succinate may have effects similar to exercise.
- ▶ The NIDDK launched the Physiology of the Weight Reduced State Clinical Trial Consortium that seeks to characterize the physiological mechanisms underlying individual variability in maintenance of reduced weight over time, which could reveal new therapeutic targets for interventions aimed at maintaining weight loss.