220th Meeting of the
National Diabetes and Digestive and Kidney Diseases Advisory Council

National Institute of Diabetes and Digestive and Kidney Diseases
National Institutes of Health
Department of Health and Human Services

Meeting convened virtually using web-based collaboration/meeting tools

I. CALL TO ORDER
Dr. Griffin Rodgers

Dr. Griffin Rodgers, Director, National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), called to order the 220th meeting of the NIDDK Advisory Council at 8:30 a.m. on September 7, 2022, via Zoom videoconference. The meeting was conducted using a two-tiered webinar format. The panelist tier consisted of NIDDK's Advisory Council members and NIDDK staff members who presented during the meeting. The audience tier was available to members of the public via a livestream, which allowed them to view and listen to the meeting.

ATTENDANCE – COUNCIL MEMBERS PRESENT

Dr. John Carethers
Dr. Iain Drummond
Ms. Dawn Edwards
Dr. Penny Gordon-Larsen
Dr. Debra Haire-Joshu
Ms. Davida Kruger
Dr. Jacquelyn Maher
Dr. Mark Nelson
Dr. Keith Norris
Dr. David Penson
Ms. Ceciel Rooker
Ms. Ricky Safer
Dr. Kathleen Sakamoto
Dr. Philipp E. Scherer
Dr. Elizabeth Seaquist
Dr. Michael Snyder
Dr. Gary Wu

Subject Matter Experts:
Dr. Susan Quaggin
Mr. Hector Soto

Ex-officio members:
Dr. David A. D'Alessio
Dr. Cindy Davis

Also Present:
Dr. Griffin Rodgers, Director, NIDDK and Chair of the NIDDK Advisory Council
Dr. Karl F. Malik, Executive Secretary, NIDDK Advisory Council
Dr. Gregory G. Germino, Deputy Director, NIDDK
Dr. William Cefalu, Director, Division of Diabetes, Endocrinology and Metabolic Diseases, NIDDK
Dr. Stephen P. James, Director, Division of Digestive Diseases and Nutrition, NIDDK

Dr. Robert A. Star, Director, Division of Kidney, Urologic, and Hematologic Diseases, NIDDK

National Institutes of Health (NIH) and NIDDK Panelists and Speakers:

Dr. Maureen Goodenow, OD/OAR
Dr. Barbara Linder, NIDDK
Dr. Jaron Lockett, NIDDK
Dr. Peter J. Perrin, NIDDK
Dr. Victoria Spruance, NIDDK
Dr. Pamela Thornton, NIDDK

II. ANNOUNCEMENTS
Dr. Griffin Rodgers

Dr. Rodgers noted that this is NIDDK's eighth consecutive virtual Council meeting because of the increased rate of COVID-19 infection in the Bethesda, Maryland area. He said that NIH has announced that meetings in January/February 2023 may be held in a hybrid format, accommodating both virtual and in-person attendance. However, plans for the next NIDDK Advisory Committee meeting have not yet been decided. The Council website will have further details in the future.

Recognition of Subject Matter Experts

Dr. Rodgers welcomed two subject matter experts attending the meeting and thanked them for their time and participation in the Council process.

- **Dr. Susan Quaggin** is the Charles Horace Mayo Professor of Medicine at Northwestern University, where she serves as the Chief of Nephrology and Hypertension and the Director of the Feinberg Cardiovascular and Renal Research Institute. Dr. Quaggin will participate in the Kidney, Urologic, and Hematologic (KUH) Subcommittee.

- **Mr. Hector Soto** is an Assistant Professor of Public Policy and Law at Hostos Community College, part of the City University of New York. Mr. Soto will participate in discussions with the Diabetes, Endocrinology and Metabolic (DEM) Diseases Subcommittee.

Council Member News

Dr. Rodgers recognized four current Council members who will rotate off of Council after this meeting: **Drs. Iain Drummond, Penny Gordon-Larsen, Michael Snyder,** and **Gary Wu.** He thanked them for their exemplary service over their terms and added that they might be asked to extend their service to the next Council meeting due to delayed processing of membership slates.

In Memoria

Dr. Rodgers noted two losses for the NIDDK research community:

- **Dr. Peter J. Roach**, Distinguished Professor at Indiana University, passed away March 11, 2022. NIDDK funded Dr. Roach's work continuously for 41 years—the longest-funded grant at Indiana University—and honored him twice with NIDDK MERIT awards in 1992 and 2005. Dr. Roach was considered the world's foremost expert on glycogen metabolism and its regulation by hormones; he discovered many fundamental properties of the molecule and its metabolic pathways, which are documented in more than 225 peer-reviewed papers. Most recently, he elucidated the molecular mechanisms responsible for the glycogen storage disease known as Lafora disease and helped developed novel drugs to treat it. He is very fondly remembered in a *Cell Metabolism* obituary.

- **Dr. Paul D. Berk**, founding director of the Liver Diseases Branch of NIDDK and a long-term NIDDK-funded investigator, passed away July 11, 2021. Dr. Berk was appointed Chief of the newly established Liver Diseases Branch in 1973, which he directed during its initial years. In 1977, he was recruited to the Mount Sinai School of Medicine as Chief of Hematology but made the transition to hepatology in 1989 when he became Chief of the Mount Sinai School of Medicine's Liver Diseases Division. Dr. Berk was a long-term NIDDK-funded investigator in the study of bilirubin and fatty acid metabolism, nonalcoholic fatty liver disease, obesity, and bariatric surgery. He also served on the NIDDK Advisory Council from 1990 to 1993. Dr. Berk was the founding editor of *Seminars in Liver Disease* and later the editor-in-chief of *Hepatology*, the official publication of the American Association for the Study of Liver Diseases (AASLD). He served on the AASLD Council for many years, was elected President in 1988, and received its Distinguished Service Award in 2003. Dr. Berk is greatly missed by the hepatology community and the many trainees that he mentored.

NIDDK Staffing News

Dr. Rodgers announced recent staffing news from NIDDK's Intramural Program:

- **Dr. Sriram Gubbi**, Assistant Research Physician in NIDDK's Metabolic Diseases Branch, was awarded the Distinguished Clinical Teaching Award, the highest honor bestowed by the NIH Fellows Committee on an NIH investigator, staff clinician, or tenure-track investigator. Dr. Gubbi received the award for his outstanding contributions in mentoring and training fellows in the NIH Inter-Institute Endocrine Fellowship Program.

- **Dr. Sanaz Sakiani** joined NIDDK as a Staff Clinician and Associate Program Director for the Inter-Institute Endocrinology Fellowship Program. Prior to joining NIDDK, Dr. Sakiani was a clinical endocrinologist in Baltimore, focusing on the treatment of people with type 2 diabetes and other endocrine diseases.

Dr. Rodgers announced recent staffing news in NIDDK's Extramural Program:

- **Ms. Esohe Irabor** joined the Division of Kidney, Urologic, and Hematologic

Diseases on detail from the HHS Office of Minority Health as a Fellow in the HHS Minority Leaders Development Program. The Minority Leaders Development Program fills a gap in federal fellowship opportunities for individuals interested in working at HHS to advance health equity and address the social determinants of health through health policies, programs, and practices. Ms. Irabor is working toward her doctorate in Howard University's Department of Biology.

- **Dr. Theresa Teslovich Woo** joined the Division of Diabetes, Endocrinology, & Metabolic Diseases as Program Director for the Human Behavioral Neuroscience of Obesity and Diabetes portfolio. This newly established portfolio supports research exploring the relationship between the brain and behavior and how these interactions might influence metabolic health, including diabetes and obesity. Prior to joining NIDDK, Dr. Woo was the clinical research protocol specialist overseeing the traumatic brain injury research portfolio at the Walter Reed National Military Medical Center's National Intrepid Center of Excellence in Bethesda, Maryland.

- **Ms. Clarissa Alexander** joined NIDDK's Division of Extramural Activities as a Program Analyst in the Office of Research Evaluation and Operations (OREO). She comes to NIDDK from the "All of Us" program in the NIH Office of the Director. Prior to joining OREO, Ms. Alexander worked as a Program Analyst at the Centers for Disease Control and Prevention (CDC). Ms. Alexander earned an M.S. in biomedical informatics with a concentration on medical informatics. She is currently pursuing an M.P.H. at Yale University.

- **Dr. Erica Bizzell** joined NIDDK's Office of Scientific Program and Policy Analysis (OSPPA) as a Health Science Policy Analyst. Dr. Bizzell received her Ph.D. from Emory University in Microbiology and Molecular Genetics and did postdoctoral research at Emory University and at the Food and Drug Administration (FDA). Following her postdoctoral work, Dr. Bizzell was awarded a highly selective and competitive Science and Technology Fellowship through the American Association for the Advancement of Science. As a Fellow, she worked in the Division of Microbiology and Infectious Diseases in the National Institute of Allergy and Infectious Diseases (NIAID), in both the Bacteriology and Mycology Branch and the Office of Scientific Coordination and Program Operations. Dr. Bizzell will be working in several OSPPA areas, including planning and reporting activities.

Dr. Rodgers announced retirements among NIDDK staff members and congratulated them on their public service and remarkable careers.

- **Dr. Lawrence Agodoa**, inaugural director of NIDDK's Office of Minority Health Research Coordination (OMHRC), has retired after 35 years of service at NIH. As OMHRC Director since 2000, Dr. Agodoa spearheaded many of NIDDK's signature programs to advance health equity and scientific workforce diversity. He also led the development and implementation of NIDDK's first Strategic Plan on Minority Health Disparities and made valued public health contributions through kidney disease research and clinical practice. In all his roles, Dr. Agodoa remained

tirelessly dedicated to achieving NIDDK's mission of improving health for all people. He will be honored with a Special Achievement Award in October 2022 by Weill Cornell Medical College, where he received his MD in 1971.

- **Dr. James Balow**, Senior Investigator in NIDDK's Kidney Diseases Branch and former NIDDK Clinical Director, retired in June after 50 years of service at NIH. He began his career at NIAID in 1972 before moving to NIDDK in 1977. Dr. Balow served as NIDDK's clinical director from 1989 to 2020 and contributed to countless discoveries, including establishing the NIH regimen for treating lupus nephritis. He started several unique programs, including the first in-house nephrology patient consult service at the NIH Clinical Center and a world-class clinical research program on immunologically-mediated glomerular diseases.

- **Dr. Anthony Furano**, Section Chief in NIDDK's Laboratory of Cell and Molecular Biology, retired after 39 years with the Institute. Dr. Furano and his laboratory carried out several pioneering studies, including demonstrating that the protein chain elongation factor, Tu, is the most abundant cytoplasmic protein found in E. coli, and that Tu is co-regulated with its RNA components. Before the emergence of whole-genome DNA sequencing, Dr. Furano's laboratory established that approximately 20 percent of DNA in mammals consists of mobile genetic elements that have been continuously evolving in mammals for millions of years. This finding led Dr. Furano's group to demonstrate that DNA repair can cause genetic mutations. Dr. Furano serves on the editorial board of *Mobile DNA* and is a contributing member of the University of California San Diego Project for Explaining the Origin of Humans.

- **Dr. Joseph Shiloach**, Senior Investigator and head of NIDDK's Biotechnology Core Laboratory, retired after 43 years with NIH. Dr. Shiloach divided his time at NIDDK between basic biotechnological research and the production of various biological compounds for research projects across NIDDK and NIH. Dr. Shiloach's work focused on developing ways to isolate and produce biological products from sources such as mammalian cells, insect cells, bacteria, yeast, and fungi. His work played a significant role in vaccine development, drug development, and other important applications. With Dr. Shiloach's retirement, NIDDK will retire the Biotechnology Core Laboratory and its production facility.

- **Dr. Karen Teff**, Program Director in NIDDK's Division of Diabetes, Endocrinology, and Metabolic Diseases, retired after 9 years of service. Dr. Teff oversaw a diverse research portfolio covering basic and clinical research on the effects of bariatric surgery on diabetes, the mechanisms of hypoglycemia, autonomic nervous system control of metabolic dysfunction, and human sleep and circadian rhythms. Dr. Teff also served as co-director for the NIDDK Office of Obesity Research since 2021.

Dr. Rodgers announced that he has asked **Dr. Robert Rivers** to serve as the Acting Director of the OMHRC following the retirement of Dr. Agodoa. In this role, he will continue to address the burden of diseases and disorders that disproportionately impact the health of minority populations. Dr. Rivers joined NIH as an AAAS fellow in the National

Cancer Institute (NCI) working in the Office of Cancer Clinical Proteomics Research. He joined NIDDK as a Program Director in OMHRC in April 2015. Dr. Germino announced that Dr. Rodgers has been awarded The Obesity Society's Atkinson Stern Award for Distinguished Public Service for 2022. This award was established to recognize an individual or organization whose work has improved the lives of those affected by obesity, whether through research, public policy, or patient care.

In addition, with the retirement of Dr. Teff, Dr. Rodgers announced that **Dr. Maren Laughlin** will serve as co-Director of the Office of Obesity Research. She is a Senior Program Director within NIDDK's Division of Diabetes, Endocrinology, and Metabolic Diseases. Dr. Laughlin's portfolio includes integrative metabolism and physiology, and in vivo molecular and functional imaging as relevant to energy balance in metabolic disease.

III. CONSIDERATION OF SUMMARY MINUTES OF THE 219th COUNCIL MEETING

Dr. Griffin Rodgers

The Council approved, by electronic poll, the Summary Minutes of the 219th Council meeting, which had been sent to members in advance for review.

IV. FUTURE COUNCIL DATES

Dr. Griffin Rodgers

Dr. Rodgers noted that NIH has determined that January/February 2023 Council meetings can be held in a hybrid format to accommodate both virtual and in-person attendance. Although the NIDDK Advisory Council will take place on January 25-26, 2023, a determination has not yet been made about whether it will be virtual or hybrid.

V. CONFIDENTIALITY/CONFLICT OF INTEREST

Dr. Karl Malik

Confidentiality

Dr. Karl Malik reminded Council members that material furnished for review purposes and discussion during the closed portion of the meeting is considered confidential. The content of discussions taking place during the closed session may be disclosed only by the staff and only under appropriate circumstances. Any communication from investigators to Council members regarding actions on an application must be referred to the Institute. Any attempts by Council members to handle questions from applicants could create difficult or embarrassing situations for the members, the Institute, and/or the investigators.

Conflict of Interest

Dr. Malik reminded Council members that advisors and consultants serving as members of public advisory committees, such as the NIDDK Advisory Council, may not participate in situations in which any violation of conflict-of-interest laws and regulations may occur.

NIDDK staff shall assist Council members to help ensure that a member does not participate in, and is not present during, the review of applications or projects in which, to the member's knowledge, any of the following has a financial interest: the member, or his or her spouse, minor child, or partner (including close professional associates), or an organization with which the member is connected.

To ensure that a member does not participate in the discussion of, nor vote on, an application in which he/she has a conflict, a written certification is required. A statement is provided for the signature of the member, and this statement becomes a part of the meeting file. Dr. Malik directed each Council member to a statement in his or her meeting folder regarding the conflict of interest in review of applications. He asked each Council member to read it carefully, sign it, and return it to NIDDK before leaving the meeting.

Dr. Malik pointed out that when the Council reviews applications in groups without discussion—also called "en bloc" actions—all Council members may be present and may participate. The vote of an individual member in such instances does not apply to applications for which the member might be in conflict.

Regarding multi-campus institutions of higher education, Dr. Malik said that an employee at one campus may participate in any particular matter affecting another campus if the employee's financial interest is solely at one campus and the employee has no multi-campus responsibilities.

VI. REPORT FROM THE NIDDK DIRECTOR
Dr. Griffin Rodgers

Budget Update

Dr. Rodgers updated the Council on the current budget and the NIH appropriations process for Fiscal Year 2023 (FY 2023). Prior to the last Council meeting in May 2022, Congress passed, and the President signed, the FY 2022 Omnibus Appropriations bill into law, which gave the Institute a budget for the current fiscal year.

The focus now is on FY 2023, which begins on October 1, 2022. On March 28, President Biden released his full discretionary budget request for FY 2023. On May 11 and May 17, respectively, the House and Senate Appropriations Labor-HHS-Education Subcommittees held FY 2023 budget request hearings for NIH.

On June 22, the House Appropriations Committee released the FY 2023 Labor-HHS-Education appropriations bill. The House Labor-HHS-Education Subcommittee held a bill markup on June 23. The full House Appropriations Committee held its markup on June 30. The Senate Appropriations Committee released its appropriations bills on July 28. As of the timing of this meeting, it remains to be seen whether Congress will pass an FY 2023 appropriations bill by the end of the fiscal year (September 30) or pass a Continuing Resolution (CR) to extend government funding.

Dr. Rodgers then reviewed the specifics of the FY 2023 budget proposal. The President's Budget Request released in March includes $50.228 billion for NIH, about $5.3 billion

over the FY 2022 enacted funding level. The budget also includes a proposed $2.206 billion for NIDDK, which is very close to the enacted budget for FY 2022. Due to the extended CR in FY 2022, the FY 2023 President's Budget was developed using the CR levels as the baseline.

The House FY 2023 Labor-HHS-Education appropriations bill includes $47.459 billion for NIH, which is a $2.5 billion, or roughly 5.6 percent increase, over the FY 2022 enacted budget. This includes a 3.6 percent increase for NIDDK, from $2.204 billion to $2.283 billion.

The Senate FY 2023 bill includes $47.959 billion for NIH, which is a $3 billion, or 6.7 percent, increase over FY 2022. The bill would fund NIDDK at $2.291 billion, which is an $87 million, or a 3.9 percent increase over the previous year. The Senate bill also contains $8.55 million to restore cuts to the mandatory Special Diabetes Program that result from Budget Control Act sequestration.

Dr. Rodgers provided an update on funding for the Advanced Research Projects Agency for Health, or ARPA-H. In the FY 2022 appropriations cycle, ARPA-H received $1 billion. The President's budget request includes an additional $5 billion for the agency as a component of NIH. Of note, both the House and Senate bills include FY 2023 funds for ARPA-H, but less than the $5 billion requested by the President. The House bill includes $2.75 billion in the Office of the HHS Secretary without transfer authority, and the Senate bill includes $1 billion, given directly to NIH.

Congressional Activities

On May 10 and 17, the House and Senate Appropriations Labor-HHS Subcommittees conducted hearings on the President's FY 2023 Funding Request and Budget Justification for NIH. NIH leadership discussed a wide range of topics, including COVID-19 and pandemic preparedness, workforce diversity and opportunities for early-stage investigators, health disparities and health equity, air quality, drug pricing, nutrition, and more.

On July 7, Dr. Rodgers and Dr. Robert Star briefed Representative Raul Ruiz, who is a physician and a vice chair of the Congressional Diabetes Caucus, on areas of interest, including health disparities research, diabetes, and kidney disease.

VII. UPDATE: OFFICE OF AIDS RESEARCH AND NIDDK HIV/AIDS PORTFOLIO

Dr. Gregory Germino (moderator), Dr. Maureen Goodenow, Dr. Peter Perrin

Dr. Germino opened the session by providing some background on NIDDK's involvement with HIV/AIDS research. The HIV/AIDS set-aside was created in 1998 and was initially set at $5.4 million, which is approximately equal to $28 million today. This set-aside has grown moderately over time, totaling $37.5 million 2022. Much of this growth has been driven by the changing nature of HIV research. With the advent of effective antiretroviral therapy, HIV has become a chronic condition; therefore, there is a growing need to address comorbidities, co-infections, and complications that impact the health and quality of life of people living with HIV. Some of these complications fall within the NIDDK mission, such as kidney disease, which is a critical health disparity affecting the lives of people of

African descent with HIV; liver disease, which is a major cause of death among people with HIV; and obesity and metabolic syndromes. Synergistic research in these areas intersects with research toward an HIV cure. NIDDK's research on the effects of HIV/AIDS on anatomical sites spans the portfolios of its three divisions. Investigators in the intramural program have made and continue to make important contributions to fundamental understanding of the structure and function of key HIV proteins as well as to the development of technology that may one day offer low-cost point-of-care diagnostics. The Institute has issued multiple Funding Opportunity Announcements (FOAs) that have brought together leading experts to form fruitful partnerships. NIDDK actively seeks opportunities to collaborate with the NIH Office of AIDS Research (OAR) and other Institutes and Centers.

Dr. Rodgers then introduced Dr. Maureen Goodenow, Associate Director for AIDS Research at NIH, and Director of OAR since 2016. In those roles, Dr. Goodenow leads OAR in coordinating the NIH HIV/AIDS research agenda to end the HIV pandemic and improve the health of people with HIV. Dr. Goodenow previously served as the Acting Director of the Office for Research and Science in the U.S. Department of State, Office of the U.S. Global AIDS Coordinator and Office of Global Health Diplomacy from 2015 to 2016.

NIH Office of AIDS Research Overview
Dr. Maureen Goodenow

Guiding the HIV/AIDS research agenda, the NIH vision is to advance research to end the HIV pandemic and improve health outcomes for people with HIV. The OAR mission is to ensure that NIH HIV research funding is directed to the highest-priority areas and facilitates maximum return on the taxpayers' investment. NIH is one of 11 agencies in the Department of Health and Human Services (HHS). OAR is one of the offices within the Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI) in the NIH Office of the Director (OD). OAR was established in 1988 as the second NIH-wide Office. In addition to OAR, there are now eight unique program offices that coordinate NIH-wide research related to the behavioral and social sciences, disease prevention, tribal health, sexual and gender minorities, dietary supplements, and nutrition. Collaboration among NIH Institutes and Centers (ICs) and other federal agencies facilitates HIV research, leading to prevention, treatment, and care across the wide spectrum of issues that impact individuals and communities affected by HIV.

In 1988, the Health Omnibus Programs Extension, or HOPE Act, authorized the establishment of OAR by the Secretary of Health and Human Services acting through the NIH Director. The HOPE Act appropriated federal funding for HIV/AIDS education, prevention, testing, and research. The law authorized NIH to establish a comprehensive plan to conduct and support HIV/AIDS research, including the establishment of an NIH Strategic Plan for such research.

Additional authorities under the HOPE Act include the ability to construct or renovate laboratories and research facilities; support collaborative research conducted with industry and foreign partners; train American scientists abroad and foreign scientists in the United States; and develop and expand clinical trials, including those involving women, infants, children, people with hemophilia, and underrepresented populations. Over time, the growing HIV/AIDS research program and the complex challenges and

research needs of the HIV pandemic required additional coordination and budgetary authority. In 1993, Congress passed the NIH Revitalization Act, which broadened OAR authorities to plan, coordinate, and evaluate HIV/AIDS research; set scientific priorities for the NIH research agenda; determine the budget for all NIH HIV/AIDS research; and develop the annual Professional Judgment Budget, as discussed below.

The NIH OAR Director is appointed by the HHS secretary to carry out several duties including: oversee the HIV/AIDS research conducted or supported by NIH; represent the NIH HIV/AIDS Research Program to relevant Executive Branch offices, task forces, and committees; and foster and maintain communications with federal agencies and other key partners. As the NIH Associate Director for the HIV/AIDS research at NIH and as the OAR Director, Dr. Goodenow reports to both the NIH Director and the DPCPSI Director. OAR is organized into five teams: operations; data analytics and evaluation; policy, legislation, communications, and engagement; budget; and science. Science includes basic translational and clinical research as well as behavioral and social science sciences and population health.

The key functions of OAR include catalyzing, coordinating, communicating, and convening research across NIH and beyond through diverse collaborations and partnerships. OAR works closely with NIH ICs to ensure that the HIV/AIDS research portfolio receives input from varying perspectives and expertise. Of the 27 NIH ICs, 23, including NIDDK, contribute to the formulation of the HIV agenda and receive HIV research funding for both intramural and extramural research. This has resulted in a scientifically strong, highly successful, and sustained HIV research program for more than 35 years and provides a framework to discover new scientific knowledge and make much-needed advances.

Linkages across federal agencies are essential and are facilitated by an interactive network of advisory boards and partnerships that provide critical information and expert advice to guide important decisions about the HIV research enterprise. The NIH HIV/AIDS Executive Committee (NAEC) is the advisory arm and coordinating committee for all NIH HIV research efforts that provides recommendations to the OAR Director. The Office of AIDS Research Advisory Council (OARAC) is an internal committee that provides advice to the OAR Director on the planning, coordination, and evaluation of research and other HIV/AIDS activities conducted or supported by NIH. It does not advise on funding decisions, because OAR does not directly fund research.

Other federal advisory groups that report to department secretaries or the White House include: the Centers for Disease Control and Prevention/Health Resources and Services Administration (CDC/HRSA) Advisory Committee on HIV, Viral Hepatitis and STD Prevention and Treatment; the Presidential Advisory Council on HIV/AIDS (PACHA); and the Department of State's Office of the U.S. Global AIDS Coordinator and Health Diplomacy (S/GAC) mission responsible for the U.S. President's Emergency Plan for AIDS Relief (PEPFAR). The White House Office of National AIDS Policy serves as a link between HHS, other departments, and the President. Each includes an ex-officio federal staff member, including the OAR director, as well as liaisons to the community and academic sectors.

HIV research requires a multidisciplinary approach that aligns with NIH HIV research

priorities, which are to reduce HIV incidence; develop next-generation therapies for HIV; address HIV-associated comorbidities, co-infections, and complications; conduct research toward an HIV cure; and advance cross-cutting areas of research. These include basic and clinical science, behavioral and social sciences, epidemiology, implementation science, information and dissemination science, and research training. Research priorities are based on global HIV data and the science needed to prevent, treat, and ultimately cure HIV. The current priorities were established for FY 2016 and then renewed and extended through FY 2025. OAR also engages with the scientific community, people with HIV, and a variety of partners to determine the research priorities that outline the broad research agenda for HIV, guide decision-making processes related to HIV funding, and inform the development of the NIH Strategic Plan for HIV.

The NIH Strategic Plan for HIV and HIV-Related Research for FYs 2021-2025 outlines four goals: advanced rigorous and innovative research; ensure flexibility and responsiveness; promote dissemination and implementation of discoveries; and build human resources and infrastructure capacity.

The federal approach that facilitates the U.S. HIV research agenda includes three major components: (1) the Ending the HIV Epidemic in the U.S. initiative that was launched by HHS in 2019; (2) the revised National HIV/AIDS Strategy that was released by the White House Office of National HIV/AIDS Policy December 1, 2021; and (3) the NIH Strategic Plan for HIV and HIV-Related Research. These three complementary frameworks at the agency, department, and White House levels guide basic, clinical, and behavioral social science research priorities. Some of the signature programs include supporting early career investigators; increasing understanding of the comorbidities, co-infections, and other complications that develop across the lifespan of people with HIV; and supporting the development of cutting-edge methodologies and technologies to advance HIV science.

In April 2022, NIH held a workshop for early career investigators in HIV/AIDS who aimed to gain knowledge about HIV/AIDS research across NIH to communicate with mentors and other early career investigators, focus on resources and funding opportunities available to support early career investigators, and explore opportunities to enhance diversity and research capacity.

The Professional Judgment (PJ) Budget, a document NIH prepares as required by the NIH Revitalization Act of 1993, states that the full budget for carrying out the HIV research plan must be submitted directly to the President. The PJ Budget provides OAR with an annual opportunity to present an aspirational budget that highlights areas of research that would benefit from additional investment. Priority areas are identified each year through discussions within NIH, federal partners, and the HIV/AIDS community. The 2023 budget estimates a need of $639 million in additional funds, a 20 percent increase in the HIV research investment over the FY 2022 enacted budget. The increased funding would expand the NIH investments to capitalize on key research areas: expanding basic research in biomedical behavioral and social sciences; addressing HIV co- occurring conditions; developing transformative technologies, methodologies, and implementation approaches; and enhancing diversity and strengthening capacity of the HIV research workforce. NIDDK plays an important role in each of these areas.

NIH HIV funding was essentially flat from FY 2014 through FY 2018. From FY 2019 to FY 2021, an increase of $87 million raised the total annual funding for HIV research to just over $3 billion. The congressional allocation to NIH in FY 2022 included an increase of more than $100 million for HIV research, 3.4 percent over the FY 2020 and FY 2021 levels, and the largest increase in HIV research funding since FY 2014. It represents over 13 percent of the estimated $775 million requested in the 2022 PJ Budget.

NIH HIV research dollars are allocated at different levels across the ICOs. NIDDK traditionally ranks among the top 10 ICs that receive HIV dollars; in FY 2021, it ranked 8th and received $34.135 million, which represents 1.6 percent of its total research allocation. About 20 percent of that funding was allocated to the intramural program and 80 percent to the extramural program.

Since 2017, the overall NIDDK budget has steadily increased, as has its HIV budget. Each year, OAR uses a portion of its annual appropriated budget for the Innovation Program, which allows ICs to swiftly respond to specific scientific needs by supporting current-year funding for HIV research projects. Thus, in addition to the HIV allocation, NIDDK received almost $8 million in OAR Innovation Program funding from FY 2020 through FY 2022.

The NIDDK HIV research profile, relative to the rest of NIH, is unique among ICs. NIDDK's areas of expertise and investment are highlighted by the differences in the distribution of resources across the five NIH HIV research priorities. For example, in 2021, more than 41 percent of NIDDK's HIV research portfolio focused on comorbidities, coinfections, and complications compared with 18 percent across NIH as a whole. As an example, NIDDK’s focus on nutrition and food insecurity among those with HIV/AIDS is an important contribution. Among the many advances in HIV research supported by NIDDK are studies to characterize the HIV viral reservoir in the gut, kidney, and liver. An analysis of 318 projects in the NIDDK HIV portfolio for FY 2017 through FY 2021 showcases major themes such as immune responses and issues relevant to NIDDK's mission and will help facilitate identification of research needs and opportunities.

NIDDK’s focus on HIV tissue reservoirs, comorbidities, co-infections, and complications addresses important cross-cutting topics within NIH’s research priorities. Moreover, NIDDK is a valued partner with unique contributions to ending the HIV pandemic that span a wide range of diverse and cross-cutting topics, addressing key areas of HIV/AIDS research emphasized by NIH, the National HIV/AIDS Strategy, and the Ending the HIV Epidemic in the U.S. initiative.

NIDDK HIV/AIDS Portfolio
Dr. Peter Perrin

Dr. Germino introduced Dr. Perrin, Program Director in the NIDDK Division of Digestive Diseases and Nutrition. Dr. Perrin focuses on basic and translational research related to gastrointestinal (GI) mucosal immunology and HIV science with a focus on HIV/AIDS comorbidities, complications, and co-infections. He is also Program Director for the Digestive Diseases Research Core Centers and NIDDK’s HIV/AIDS Research Coordinator.

Dr. Perrin began by acknowledging and thanking his colleagues for assistance in developing this presentation, Dr. Khoa Nguyen and Ms. Vanessa White.

He then focused on the NIDDK HIV/AIDS portfolio allocation, which grew from $30 million in FY 2014 to $37.5 million in FY 2022, roughly a 25 percent increase. Adjusting by the Consumer Price Index, the budget has kept up with inflation. NIDDK has strategized over the years to expand the extramural program despite the challenges associated with inflation. The HIV extramural program budget grew from $20 million in FY 2014 to $30 million in FY 2022, which translates into an increase in spending power of about 20 percent.

NIDDK's HIV extramural strategy emphasizes an R01-based portfolio at $25.01 million in FY 2022, or 80 percent of the extramural awards, which includes spending on previously funded grants (out-year obligations). Over the past 4 years, NIDDK awarded 40 new R01 applications for HIV/AIDS research. In addition, $1 million dollars were allocated to the Martin Delaney Collaboratories for HIV Cure Research, the flagship multidisciplinary program at NIH for HIV cure research focused on basic and clinical research and involving partners from government, industry, and academia. NIDDK also participates in the Centers for AIDS Research.

Dr. Perrin pointed out that NIDDK's mission intersects with OAR's research priorities. Although the extramural HIV/AIDS portfolio is focused on comorbidities and co-infections, grants are also awarded in other priority areas, for example, R01s in the urology program related to reducing transmission of HIV. NIDDK's participation in the NIH HIV enterprise—including bringing together experts in HIV science and investigators with expertise in NIDDK organs, processes, and diseases—is essential. These collaborative pairings—which make up more than 40 percent of the portfolio—facilitate vigorous science, from the inception of the hypothesis, to experimental design and execution, to interpretation of the results.

There are numerous areas of opportunity for expanding into new directions in collaboration with OAR and other NIH components. Dr. Perrin noted a review published in *Nature Medicine* on World AIDS Day in December 2021 in which the International AIDS Scientific Global Strategy Working Group proposed three priority areas needing further study [1]. One priority is the need to interrogate reservoirs in specific tissues throughout the body, the idea being that the mechanisms of latency and of the reservoir might differ among the gut, the liver, the urogenital tract, adipose tissue, and other areas. Therefore, cure strategies will have to take these differences into account to achieve holistic elimination of the virus from the whole body.

There is published evidence of differences across the reservoirs based on research funded, in part, by NIDDK. One publication by Telwatte et al. describes how different mechanisms regulate reservoir dynamics in the gut versus blood.[2] A second paper by Telwatte et al.

1 Deeks, S.G., Archin, N., Cannon, P. *et al.* Research priorities for an HIV cure: International AIDS Society Global Scientific Strategy 2021. *Nat Med* (2021 Dec;27(12):2085-2098. PMID: 34848888.
2 Telwatte S, *et al.* Gut and blood differ in constitutive blocks to HIV transcription, suggesting tissue-specific differences in the mechanisms that govern HIV latency. *PLoS Pathog*. 2018 Nov 15;14(11):e1007357.

shows that these differences have functional consequences.[3] In this case, the blood reservoir and the GI reservoir respond differently to latency reversing agents. This is important because the latent reservoir may not be accessible to the immune system, and the development of a cure strategy depends on the ability to reactivate the latent virus so that strategies involving the immune system can find and eliminate it. A third paper by Morón-López S, et al. demonstrates that it is not just the GI tract that has tissue-specific mechanisms at play, but also blood, the genital tract, and the liver.[4]

Dr. Perrin provided four examples of multidisciplinary teams studying reservoirs in the GI tract, the genitourinary tract, adipose tissues, kidney, and liver. He highlighted research by Dr. Balfour Sartor, a gastroenterologist who is highly respected for his expertise in the microbiome and intestinal inflammation, who combines his expertise with HIV experts Drs. Angela Wahl and Victor Garcia-Martinez.

Research on comorbidities, co-infections, and complications highly prevalent among those with HIV, including obesity, HIV enteritis, and leaky gut, is central to the NIDDK mission. Liver diseases are a leading cause of death in people with HIV, second only behind cardiovascular disease. Different manifestations of kidney disease affect people with HIV, including HIV-associated nephropathy, which disproportionally affects people of African descent.

Importantly, there are differences in the pathogenesis of conditions in people with and without HIV. These differences often involve the manners in which the virus, or even antiretrovirals, interact directly with the host. One example of the effects of antiretrovirals is the weight gain seen in people with HIV, which is associated with a class of antiretrovirals that may also provoke metabolic syndrome in a subset of people.

Other areas of focus include host interactions with viral accessory proteins that negatively affect kidney, GI, adipose, and other host tissues. Interactions between co-infections, such as HIV co-infection with hepatitis B or C, exacerbates both diseases. HIV-specific mechanisms underlie the loss of GI, immune, and microbial homeostasis; moreover, leaky gut causes inflammation throughout various tissues and premature aging in people with HIV, known as “inflammaging.”

NIDDK supports collaborations between HIV scientists and scientists with deep understanding of disease processes within tissues, some of whom may never have collaborated together previously. These grants cross NIDDK Divisions. For example, through the Innovation Program, one team received a 1-year supplement to look at the impact of viral proteins on the intestinal barrier, conducting an in-depth study to find a druggable target for prevention or treatment. This team eventually competed successful for an R01 award. Another team, funded by the Division of Diabetes, Endocrinology, and Metabolic Diseases, involves a mix of people with expertise in HIV, metabolic disease, nutrition, and adipocyte biology to study detrimental changes in adipose distribution,

3 Telwatte S. *et al.* Mechanistic differences underlying HIV latency in the gut and blood contribute to differential responses to latency-reversing agents. AIDS. 2020 Nov 15;34(14):2013-2024.
4 Morón-López S, *et al.* Tissue-specific differences in HIV DNA levels and mechanisms that govern HIV transcription in blood, gut, genital tract and liver in ART-treated women. J Int AIDS Soc. 2021 Jul;24(7):e25738. PMID: 34235864.

adipocyte function, and adipose immune environment resulting from antiretroviral therapy. Another multidisciplinary team received funding from the Innovation Program and is examining the role of the accessory protein Vpr-mediated cell cycle dysregulation in HIV-associated kidney disease.

NIDDK is also addressing social determinants of health (SDOH) with a Request for Applications (RFA) that aims to find ways to help with food insecurity in people with HIV while also treating comorbidities nutritionally. This issue deserves specific focus within the HIV community because people with HIV confront certain biological differences that are the consequences of polypharmacy, antiretrovirals, and inflammation. The population of people with HIV is aging (average age of over 50 years) due to successful therapies. Moreover, people living with HIV have faced stigma and discrimination. Nevertheless, these communities have developed resilience, culture, strategies, and infrastructure for living with HIV. Three R01 grants were funded to support research in this area—two by NIDDK, and one through the National Institute of Nursing Research.

Dr. Perrin ended with a discussion of opportunities for new collaborations. Exploration is needed for a better understanding of how comorbidities, co-infections, and complications might confound a cure strategy. Learning about the influence of the tissue environment earlier in the process of cure development may address mechanistic questions about how to approach a cure in people who are not otherwise healthy. It is important for NIDDK to integrate and work with other NIH ICs, particularly through the Martin Delaney Collaboratories. Leveraging pre-existing consortia could facilitate pursuit of other opportunities; for instance, the Liver Cirrhosis Network could be tasked with exploring how statins improve liver disease in people with HIV.

Another opportunity lies in nurturing the next generation of "wet bench" researchers to expand the pipeline of investigators studying HIV and comorbidities in keeping with OAR and NIH priorities. NIDDK conducted a portfolio analysis that showed an alarming dearth in the investigator pipeline for HIV research. The Institute is working with other ICs on these goals. Finally, more research could investigate topics such as nutritional needs and food insecurity, particularly in specific HIV-infected subpopulations with different life experiences, like gay and bisexual men, transgender individuals, or children experiencing homelessness.

Council Questions and Discussion

Comment from Council: *Why are younger people not pursuing the field of HIV research? Is it because current therapies lead them to believe that HIV biology is no longer a pressing scientific issue or that the success of current therapies makes HIV/AIDS less of a public health concern?*

Dr. Goodenow replied that there are multiple factors at play, and that both of those perceptions are held. Despite existing tools to treat HIV/AIDS, there are still pressing needs in prevention and treatment with real opportunities for young investigators. This message and associated funding need to be disseminated and made readily accessible. She added that the cohort of HIV investigators is aging and needs to be replenished. Dr. Perrin added that NIDDK is leading a recently published program announcement, PAR 23-024, using the DP1 mechanism with three other Institutes that will encourage

investigators across all disciplines to pursue "wet bench" research on HIV comorbidities.

Comment from Council: *There is an effort to integrate HIV-related research into the NASH Clinical Research Network. What is the status of that effort, and can you provide an update on potential integration of HIV-related studies into that mechanism as well?*

Dr. Perrin referenced an R01 that was funded through the NIDDK Liver Branch, which is making progress in recruitment.

Comment from Council: *Do the pairings of HIV investigators with other non-HIV investigators occur organically, or are they required by specific RFAs?*

Dr. Perrin said both approaches are used, with some RFAs requiring multidisciplinary investigators. This has, at times, stimulated interest in collaborations that come through in investigator-initiated R01 applications.

Comment from Council: *Is it possible that a focus on international infectious disease or COVID-19 has contributed to young investigators not pursuing opportunities in HIV?*

Dr. Goodenow responded that the international programs within NIH and within the HIV program have supported the development of investigator capacity. However, it is difficult to track individual early career investigators because they tend to be supported through large programmatic awards and networks, rather than R01s. Data about the pipeline focuses on the success rate across various funding categories. Despite significant training, strong translation into a robust pipeline of independently funded early career investigators is not occurring.

Comment from Council*: Other than food insecurity, is NIDDK considering other ways to approach researcher networks to address social determinants of health?*

Dr. Perrin replied that food insecurity was a natural first focus because of the Institute's expertise in both nutrition and HIV comorbidities. Other social determinants of health will require more discussion across NIDDK. Dr. Goodenow added that many of the issues related to social determinants of health requires integration and collaboration with other agencies such as CDC and HRSA. These issues are included in the national and department-level HIV strategies across the government and HHS agencies, so there are other active programs across the agencies. Dr. Germino added that NIDDK has been developing a Health Disparity Health Equity Implementation Plan, of which social determinants of health is a theme.

Comment from Council*: Has NIDDK or NIH aligned with foundations or similar research enterprises in Europe or Africa to leverage HIV knowledge?*

Dr. Goodenow responded that there are collaborations with other global entities, such as the Gates Foundation. However, the United States has the largest investment in HIV/AIDS research. Nonetheless, efforts are made to communicate, align priorities, avoid redundancy, and leverage resources with other global entities, particularly in vaccine research.

VIII. NIDDK FUNDING TRENDS (10th Anniversary)

Dr. Gregory Germino and Dr. Jaron Lockett

Dr. Rodgers introduced Dr. Germino and Dr. Lockett to give the 10th annual update on the Institute's funding trends from FY 2012 to FY 2021.

Dr. Germino began by noting that the purpose of the May 2012 NIDDK Council meeting presentation was to ensure that "the extramural research portfolio reflects the Institute's core values, whether NIDDK is moving in the right directions, and whether the values should be adjusted for the future to ensure that the NIDDK is aligning its budgetary investments with its top priorities." The original NIDDK core values, as articulated by Dr. Rodgers when he became NIDDK Director in 2007, are:

- Maintaining a vigorous research portfolio
- Preserving a stable pool of talented new investigators
- Fostering exceptional research training and mentoring
- Supporting pivotal clinical studies and trials
- Ensuring dissemination of science-based health information through communications and outreach activities

Dr. Germino noted that after a decade, the goal is to reflect on that presentation and the core values, examine the NIDDK portfolio in the last 10 years, and see how the Institute has supported those values. At the time of the initial presentation, the Institute considered questions such as whether the extramural portfolio reflects these values, whether the Institute was on the right track given the tight fiscal environment, whether it should adjust its priorities and funding decisions, what adjustments might be made to align the budget with priorities, and which trends are potentially encouraging or might require some additional attention.

Much has happened since the 2012 presentation, including the sequestration in 2013, followed by a number of years of flat budgeting. Fortunately, the budgets subsequently have grown or changed. The focus of this discussion was on the first three core values in the list above and identifying areas for future opportunity and change. Dr. Germino introduced Dr. Lockett to continue the presentation.

With regard to the core value of maintaining a vigorous research portfolio, Dr. Lockett began by noting that from 2010 to 2021, the NIDDK budget increased by about $323 million, or 13 percent. Of the total Congressional allocation of $2.2 billion, about 80 percent went to the extramural research community. The largest funding mechanism is research project grants (RPGs) at 70 percent, which includes awards such as the R01, R21, R37, and U01. This percentage has remained constant over the past 10 years. Other funding mechanisms include the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) initiatives, research centers, research career awards (all K awards and the R00 awards), and training awards (all F and T activities).

The majority of RPG spending is on R01s, fluctuating from 69 percent of RPG spending in 2010, down to 65 percent in 2016, and then up to 84 percent in 2021. In contrast, decreased relative spending has occurred in other activity codes. For example, U01 awards represented 17 percent of the extramural spending in the RPG line in 2010 and

fell to 6 percent by 2021. The Institute has noted these shifts and is in the process of analyzing these trends.

The R01 mechanism is the primary means of support for investigators and serves as a barometer for the health of the investigator-initiated portfolio and investigator workforce. Total R01 spending increased by about $386 million, or 33 percent, from FY 2012 to FY 2021, even with a 4-year period of contraction due to sequestration and flat budgets. However, this does not necessarily translate into a 33-percent increase in spending power. When adjusting for inflation using various indices such as the Consumer Price Index or the Biomedical Research Development Price Index, the increase in spending is actually about 21 percent, an approximate $200 million loss in spending power over the decade. As the price of science increases because of inflation, the spending power of these awards decreases. Nonetheless, even after adjusting for inflation there is a real increase in the level of support of R01s, meaning the Institute has been supporting more principal investigators (PIs) and more projects. In a comparison between FY 2015, the lowest point, to FY 2021, the highest point, NIDDK supported 437 more projects and 595 more investigators. These trends are in line with the core values.

Dr. Lockett added that some trends have been noted in the R01 portfolio. First, investigators are approaching these awards differently and leveraging multi-PI grants. The multi-PI grant supplements, but does not replace, the traditional single-PI R01 and encourages collaboration when appropriate to address the scientific question. NIDDK is supporting more multi-PI R01 grants over time, nearly tripling the number of multi-PI R01 grants from 203 (9 percent of all R01) in FY 2012 to 594 (25 percent of all R01) in FY 2021.

Second, the average award for R01s has increased. Costs for both single- and multi-PI R01s have increased at relatively the same rate. Overall, the average cost of a multi-PI R01 grant is about $105,000 more than a single-PI grant due to the need for additional personnel, supplies, and equipment. This cost difference is one driver behind the growth in total R01 costs. Increased costs also could be due to the continued shift away from modular grants to budgets with direct costs above $250,000 per year. Another factor driving costs could be continued decline in the percent of Competitive Renewals (Type 2 Awards). Another factor driving up the increase in total R01 spending is the use of higher pay lines, which resulted in an increase in the number of projects being supported.

Dr. Lockett then shifted focus to the core value of preserving a stable pool of talented new investigators, with a focus on early-stage investigators (ESIs). ESIs are PIs who have completed their terminal degree or their postgraduate clinical training within the last 10 years but who have not successfully competed for an R01 or equivalent award. There was a steady increase in the number of ESIs and ESI applications from FY 2012 to FY 2016, with some fluctuations between FY 2016 and FY 2021. In 2018, 88 ESIs were supported and 64 in 2019. Of note, a third more were supported in 2020 and 2021 when compared to 2019. This increase is due to the Institute's intentional action of supporting all investigators across the board, but most markedly the ESI cohort. From 2019 to 2020 there was an increase in the pay line across all categories but most notably in the ESI pay line, which increased by 7 points, from 18 to 25.

Across NIH there has been an increase in the mean and median age of R01-funded PIs.

NIDDK has noted a similar pattern within its extramural workforce. There was a similar increase in the mean and median ages of the Institute's R01-supported PIs from 2012 through 2019. However, from 2019 to 2020, there was a slight decrease in the mean age of R01 PIs, and this downward trend continued in 2021. Although the decrease is small, it is the first time in 8 years that the age of the PIs in the R01 portfolio has not risen. This observed increase could be the result of the increased ESI pay line in 2020 and 2021. These trends will be updated when 2022 data are available, and NIDDK will examine whether increases in age over the past decade were primarily driven by ageing PIs with an M.D. degree, as was noted in 2012, and whether the flattening is due to the replacement of those PIs with younger M.D.s or Ph.D.s.

Dr. Lockett turned to the third core value to be discussed: fostering exceptional research training and mentoring. In addition to taking action to support those ESIs who are the next generation of researchers, NIDDK leverages other mechanisms to support future PIs, such as K and F awards. First, K awards typically attract a wide array of researchers and physician-scientists. The goal of many of these awards is to support those who need research training and additional experience as they transition to an independent research career. In contrast, the F trainees are pre- and postdoctoral trainees who are developing their research portfolios.

With regard to the K01, K08, K23, and K99 awards, there have been some fluctuations and changes across the four mechanisms over the past decade. For example, there was an increase in the number of K01 awards from 2012 to 2015, followed by a slight drop in 2016 and a plateau through 2020, then a sharp uptick in 2021. A similar pattern exists for the K08 awards. K23 levels remained steady from 2012 to 2017, followed by consistent increases, and the K99 awards have remained constant over the decade. The uptick in the K01, K08, and K23 awards are likely due to an extension that NIDDK provided to K awardees in response to the COVID-19 pandemic, even if the PI would have come off the K award in 2020. This anomaly may level off in the next fiscal year.

K awardees are a vital part of the next generation of researchers; they come from varying educational backgrounds and the type of degree they hold informs the type of K grants for which they apply. The K01 activity is a research scientist development award, and the majority of recipients hold a Ph.D. K08s and K23s are designed for physician researchers and attract mostly M.D.s and M.D.-Ph.D.s. The K99 awardees are primarily Ph.D.s, and this particular mechanism supports the initial phase of the career/research transition.

There have been several dramatic changes in the F awards portfolio over the last 10 years. First, the F30 awards have shown a modest decrease in the number of trainees from around 100 in 2012 to 80 in 2021. In contrast, there has been a sharp rise in the number of F31 awards starting in 2014. This is likely the result of an NIH-wide FOA for the F31 award, which resulted in more NIDDK support. Additionally, in 2018, the National Institute of General Medical Sciences withdrew from the F31 FOA, which increased the number of applications that came to NIDDK. The number of F32 awards has decreased over the last 10 years. There could be several reasons for this, for example, investigators moving to other ICs for support or leveraging other funding mechanisms. NIDDK is looking for reasons behind this trend, as it could be worrisome when combined with a reported decrease in the number of trainees supported through the Institute's T32 mechanism.

Dr. Lockett concluded that these data demonstrate NIDDK's alignment to its core values. These core values also suggest the Institute should explore PI demographics in the interest of having not only a diverse research portfolio, but also a diverse pool of investigators with regard to race, sex, ethnicity, and age. He then provided demographic data on R01 PIs, as collected by the Office of Extramural Research and protected to address privacy or security concerns. PIs are not required to provide these data and NIH policies require that specific requests for demographic information be well-scoped and that ICs that report these data follow strict guidance.

Dr. Lockett provided data from PIs who have applied for a R01 from 2012 to 2021 and self-identified their race: 6,860 identified as White, 2,680 identified as Asian, 237 identified as Black or African American, and 18 identified as American Indian or Alaska Native. Other response categories were unknown, withheld, or more than one race. In viewing the race data of PIs who received an R01, the following data were presented: of the 6,860 PIs who identified as White, 3,131, or 46 percent, were funded; of the 2,680 PIs who identified as Asian, 1,060, or 40 percent, were funded; of the 237 African American or Black PIs who submitted an application, 60, or 25 percent, were funded. Dr. Lockett acknowledged that there is a lot of work that needs to be done to diversify the NIDDK R01 PI pool. Efforts within NIDDK, along with NIH-wide efforts such as the UNITE Initiative and in the Chief Office of Scientific Workforce Diversity, are examining and developing avenues to enhance the diversity of supported PIs.

With regard to R01-funded PIs by sex, on average, the proportion of female PIs in the NIDDK portfolio is about 28 percent. Over the course of the decade, the proportion increased from 25 percent in FY 2012 to 31 percent in FY 2021. These data indicate that more must be done to diversify the portfolio by sex. There is a better balance of sex in other portfolios, specifically the K awards. Data from other portfolios can be provided to Council upon request.

Dr. Lockett ended by summarizing that: R01 awards, supported PIs, and costs are increasing; the number of multi-PI R01 grants have increased; NIDDK has maintained and increased the level of ESIs; the age of investigators had been increasing steadily, but has shown a 2-year downward movement; the number of F and K awardees has fluctuated depending on the specific activity, but there are some potentially worrisome trends; and the demographic data on the R01 pool of PIs shows disparities by race and sex. Tying this back to the three core values as discussed, they are as germane today as 10 years ago. Clearly, some trends are moving in the right direction, but the data show a need for additional focus and improvement.

Dr. Lockett closed by thanking Dr. Sreenivasan Rajamoni Nadar, Scientific Program Analyst, OREO/NIDDK, and Virginia Pool, Program Analyst, for their contributions to this presentation.

Council Questions and Discussion
Dr. Germino, moderator

Comment from Council: *Is the funding success rate of females who submit an R01 application the same as for males?*

Dr. Lockett said he would review the data and report back to Council.

Comment from Council: *Are there data available on how successful ESI recipients have been on their first competitive renewals?*

Dr. Lockett said he would review the data and report back to Council.

Comment from Council: *Has NIDDK asked why is there no category for non-White Latinos in the R01 PI demographic data?*

Dr. Lockett responded the data are collected on ethnicity, so individuals can report as either Hispanic or non-White Hispanic. He acknowledged that this is a difficult question when collecting demographic data in general.

Comment from Council: *Is it possible that the drop in the number of F32 awards is a result of migration into industry careers, and if so, would NIDDK consider that to be a success?*

Dr. Lockett responded that this decrease has been seen across NIH in both the intramural and extramural programs. There is a concern that young investigators do not see becoming a PI as a viable option, so they are pursuing other careers. Dr. Germino added that it is possible that NIDDK is seeing declines in some types of awards (*e.g.,* K08) because investigators are applying to other NIH ICs or just not pursuing academic careers. It will be interesting to observe whether the surge in F31 awards leads to an increase in F32 awards. Dr. Lockett said OREO will subsequently be examining trainee grant history following the receipt of an F31 award.

Comment from Council: *First, how does NIDDK compare to other NIH ICs with regard to the increase in its number of R01 investigators, and second, what is known about the disciplines of the multi-PI teams?*

With regard to the first question, Dr. Lockett noted that those data can be obtained and explored. Dr. Lockett then said that the disciplines of the multi-PI teams have not been assessed but could be. However, because the intent is to facilitate teams of investigators with multiple areas of expertise, one can assume they come from diverse disciplines.

Comment from Council: *Are there data on how many investigators have an R01 as the sole PI and are also a Co-PI on a multi-PI grant? Further, if someone is listed on a multi-PI application, are they less likely to be included on other types of applications?*

Dr. Lockett replied that PIs are tracked as included on a multi-PI award, but data have not been analyzed to determine how many appear on both types of awards. Those data could be obtained.

Comment from Council: *More work needs to be done within the research and academic environment to enhance the value, appreciation, and promotion of recipients of multi-PI awards, who might not be the contact PI or listed as first or last author on papers. These factors could create disincentives for continuing on the academic research path and*

instead leave research for clinical practice or a career in industry. Other institutions should engage in policies and practices that encourage engagement in the research sphere.

Comment from Council: *More attention needs to focus on how other factors are creating disincentives for young investigators to start and sustain a research program, such as research cores, laboratory costs, regulatory compliance, and research resources. Academic institutions could better invest in creating a sustainable environment for young researchers, particularly in basic science.*

Comment from Council: *Given the inverse relationship between the decrease of K08 applications and the increase in K23 applications, is it possible there is cause and effect—that is, are clinicians making a deliberate decision to choose more patient-oriented research rather than basic research?*

Dr. Germino confirmed that there is an assumed relationship as a result of the apparent correlation, with M.D.s and M.D.-Ph.D.s increasingly choosing clinical over basic research. More K08 awardees are M.D.-Ph.D.s., whereas M.D. investigators are more often seeking K23 awards.

Comment from Council: *Was the increase in the percentage of R01 awards as part of the RPG budget intentional and how has it affected NIDDK's ability to support its own research agenda at the programmatic level?*

Dr. Germino responded that there was a conscious decision by the Institute to raise the pay line in order to retain or attract investigators, which resulted in an all-time high number of PIs and ESIs. However, NIDDK needs to now consider what this increase has meant for other efforts. Dr. Lockett emphasized that the Institute continues to look into these trends and identify what the next steps might be.

Comment from Council: *What is known about the diversity of the training pool? Is NIDDK losing people from underrepresented groups compared to 10 years ago?*

Dr. Lockett replied that there are demographic data for the training population. He added that, over time, the F31 and F32 populations have become increasingly composed of people who identify as White—more than 70 percent—since FY 2017. Thus, more work needs to be done diversifying the trainee population.

Dr. Lockett reiterated his commitment to answer the questions raised that could not be answered. Dr. Rodgers concluded the discussion by emphasizing the need for the Institute to make decisions based on evidence and that ongoing data analyses will provide the information needed for decisions and future discussions. He thanked Council for its questions and comments.

IX. CONCEPT CLEARANCE

Dr. Rodgers then turned to Concept Clearance by Council, a step required before ICs can publish funding opportunity announcements, or FOAs. To streamline this process, summaries of the concepts were supplied to Council members for their review before

the meeting. Cleared concepts will be made publicly available on the NIDDK website. He then introduced each speaker.

Concept Renewal: Institutional Network Award for Promoting Kidney, Urologic, and Hematologic Research Training
Dr. Victoria Spruance

The Division of Kidney, Urologic, and Hematology Research (KUH) at NIDDK has reshaped and refocused its approach to institutional research training. In lieu of KUH participation in the NRSA T32 program, the "Institutional Network Awards for KUH Research Training" program was introduced in 2020 to support pre- and post-doctoral trainees in KUH research. These awards are designed to cultivate a vibrant and dynamic network of people and resources across an entire institution to engage, recruit, prepare and sustain the next generation of KUH researchers. Through this program, each institution may apply for a single award to support at least 5 highly competitive trainee slots across KUH research. In contrast to the traditional T32 awards, Institutional Network Awards also provide direct support for innovative networking, outreach, and career development activities and resources. Approval of this concept renewal will allow KUH to support additional Institutional Network Awards and continue efforts to evaluate the efficacy of this new training approach.

Council Questions and Comments

Dr. Rodgers invited Council members to ask any questions related to the KUH concept.

Comment from Council: *For clarification, is this a U funding mechanism that replaces the T32 and combines the three areas of emphasis of KUH? Is this going to be a trend for other T32s?*

Dr. Spruance confirmed that it is a U award, and that it is a departure from the T32 in that KUH is limiting these awards to one per institution. The goal is community building, making sure trainees have a place to call home, and acknowledging that there are certain elements to training that are not necessarily discipline-specific. These include activities such as grant writing, scientific communication, and building leadership skills. These awards support trainees across all three of KUH scientific mission areas and it is expected that, to the extent feasible, applicants are expected but not required to incorporate all three of those disciplines. She added that this is a pilot program.

Comment from Council: *Are these "glue grants", in that institutions with multiple existing T32 awards will combine their efforts under a single grant?*

Dr. Spruance replied that while there are some institutions combining T32 efforts, it is not a requirement and some awardees have never been represented in the T32 portfolio. However, the goal is to bring together different efforts under one umbrella, particularly if there are existing T32 awards, in order to create a larger community and additional resources to support trainees.

Renewal of PAS-20-160: Small R01s for Clinical Trials Targeting Diseases within

the Mission of NIDDK
Dr. Barbara Linder

Improving prevention and treatment of disease requires large clinical trials to ensure efficacy and safety of the proposed intervention. The first step in this process is often exploratory, short-term work to investigate new ideas. Preliminary data are needed about intervention effects and to support feasibility of recruitment/retention and study conduct. Aside from generating preliminary data on intervention efficacy, a key aspect of these early phase clinical trials would be assessing protocol feasibility issues so that operational hurdles can be addressed before the conduct of a larger clinical trial, potentially leading to stronger, fully powered R01 applications. There is also an ongoing need to strengthen opportunities for young, clinical researchers to obtain quality preliminary data that will allow them to develop independent research careers. We propose to reissue PAS-20-160 (Small R01s for Clinical Trials Targeting Diseases within the Mission of NIDDK), to support R01s for 3-year clinical trials having a solid scientific premise and sufficient demonstration of operational feasibility to conduct a pilot. Additional preliminary data would not be required. Applications submitted to this PAS will be reviewed by CSR and assigned a percentile with other R01 applications. A small set-aside will be included to be able to augment the pool of clinical researchers, if there are highly meritorious applications beyond the pay line.

Council Questions and Comments

Dr. Rodgers invited Council members to ask any questions related to renewal request.

Comment from Council: *Several members noted the importance of this opportunity for K23 recipients, which provides them an opportunity to develop a larger grant application and build their clinical research efforts.*

There being no further questions or comments from Council, Dr. Rodgers proceeded to request a motion for concurrence with the two concepts presented. The motion was made, seconded, and approved by electronic vote.

X. UPDATE: HEALTH DISPARITIES AND HEALTH EQUITY WORKING GROUP

Dr. Pamela Thornton and Dr. Gregory Germino

Dr. Rodgers began the final open session by noting that the Institute's Council Forum on Underrepresented Investigators and Underrepresented Science recommended the establishment of a Working Group on Health Disparities and Health Equity. At the last Council meeting, all five subgroups of the Working Group provided an update on membership goals and initial questions to consider. He then introduced Dr. Thornton to lead an update on progress of activities of NIDDK's Health Equity Working Group subgroups.

Dr. Thornton began by acknowledging and thanking the Working Group's efforts, which are informing this plan. She reviewed the composition of the Working Group, which consists of dedicated NIDDK staff and extramural members with extensive scientific, patient advocacy, lived experience, and community-based expertise. The Working Group

has been organized into five scientific thematic areas and subgroups, each of which met twice in 2022. Dr. Thornton expressed special appreciation for the input received from subgroup 5, composed of community member and patient experts, for their thoughtful consideration of the recommendations put forth by the four other subgroups, and for their insightful comments about how the Institute can build trust with individuals and communities that experience health disparities to help eliminate preventable disparities and facilitate broader participation in research activities.

Council previously received details about the emerging themes and opportunities for research from the subgroup chairs at the May 2022 Council meeting. Some of the crosscutting themes that were prominent in subgroups 1 through 4 include: an emphasis on community engagement and shared decision making about research, which includes building and sustaining trust and collaborations; listening to community perspectives and voices early on and throughout the research process; making sure community members are included in the decision making; and creating multisectoral partnerships based on equity, reciprocity, and mutual benefit for all partners.

The subgroups also identified that diverse populations need to be included in research to understand the impact of the social determinants of health on all persons. This may include, but is not limited to, those from diverse ancestry, race, and ethnicity backgrounds, sexual and gender minorities, people with different socioeconomic backgrounds and statuses, and people with multiple conditions and disabilities.

The subgroups also recommended that the Institute support more research on measures and methods of structural racism and healthcare biases. The subgroups highlighted the importance of identifying ways to integrate big data and large national data sets and data linkages to social services to better understand how these services affect the health of large numbers of people and communities. Further, more research is needed on risks for disease and interventions to address them, including how the social determinants of health or experiences with the environment interact with a person's biology. The subgroups also recognized the need for multilevel interventions that do not just target individuals, but also families, communities, and society. Another emerging theme focuses on tools and technologies, including using better tools and technologies to measure health outcomes and health-related behaviors rather than relying only on self-report data. Telehealth or hybrid healthcare delivery models were recommended, which can enhance accessibility. Another crosscutting theme is training for researchers, including training opportunities to prevent and reverse or redress healthcare bias as well as training on the science of community engagement and trust-building approaches for working with different communities. A major theme is identifying ways to restore trust when it has been broken or compromised.

The NIDDK Office of Communications and Public Liaison team has created a landing webpage for this planning process in collaboration with the Working Group’s Executive Secretary, as well as with colleagues from the Division of Extramural Activities and the Office of Scientific Program and Policy Analysis. In the future, this page will also contain the draft Plan and notification about the public comment period when those materials are ready for sharing. Dr. Thornton provided a timeline of milestones and due dates, including completed tasks and updates. During fall 2022, the Working Group will be drafting and reviewing the Plan internally with the goal of posting it for public comment in January

2023. The draft Plan will be presented to Council at its January 25, 2023 meeting for its review and input. The goal is to publish the final plan by spring 2023.

Council Questions and Comments

Dr. Thornton asked for questions from Council or comments from Working Group members. She noted a particular interest in Council's ideas about ensuring the request for information during the public comment process reaches as broad an audience as possible, including networks of diverse communities and scientists.

Comment from Council: *A Council member who also serves on the Working Group commended NIDDK for this effort and noted the importance of seeking a broad range of public comments, which will inform the direction of the report. It will be important to reach beyond academic networks into community networks. There are many community organizations with a national presence that address diverse populations that should be made aware of this plan. The more community input obtained, the stronger the report and its impact. It was suggested to ask key leaders in these organizations to provide input on these themes and content and to disseminate information about providing input to their communities. NIDDK deserves great credit for this effort, and it sets the Institute apart in many ways.*

Dr. Germino added that there has been an enthusiastic response and support from external and internal Working Group members about the effort and the robust discussions that have occurred. He said that efforts will be made to leverage the Institute's professional, community, and other associations to get out the word about the report when it is available for comment.

XI. OPEN SESSION OF SUBCOMMITTEE MEETINGS

See Minutes posted on NIDDK Council Minutes Website.

XII. CLOSED SESSION OF THE SUBCOMMITTEE MEETINGS

A portion of the meeting was closed to the public in accordance with the determination that it concerned matters exempt from mandatory disclosures under Sections 552b(c)(4) and 552b(c)(6), Title 5, U.S.C. and Section 10(d) of the Federal Advisory Committee Act as amended (5 U.S.C. Appendix 2).

Members absented themselves from the meeting during discussion of and voting on applications from their own institutions, or other applications in which there was a potential conflict of interest, real or apparent. Members were asked to sign a statement to this effect.

XIII. CLOSED SESSION OF THE FULL COUNCIL

This portion of the meeting was closed to the public, in accordance with the determination that it concerned matters exempt from mandatory disclosure under Sections 552(b)(c)(4) and 552(b)(c)(6), Title 5, U.S. Code and Section 10(d) of the 31 Federal Advisory Committee Act, as amended (5 U.S.C. Appendix 2).

Members absented themselves from the meeting during discussion of and voting on applications from their own institutions, or other applications in which there was a potential conflict of interest, real or apparent. Members were asked to sign a statement to this effect.

CONSIDERATION OF REVIEW OF GRANT APPLICATIONS.
A total of 1,158 grant applications (341 primary and 817 dual), requesting support of $510,412,643 were reviewed for consideration at the September 7, 2022 meeting. An additional 34 Common Fund applications requesting $17,484,927 were presented to Council. Funding for these applications was recommended at the Scientific Review Group recommended level. Prior to the Advisory Council meeting, 1,079 applications requesting $383,577,322 received second-level review through expedited concurrence. All of the expedited concurrence applications were recommended for funding at the Scientific Review Group recommended level. The expedited concurrence actions were reported to the full Advisory Council at the September 7, 2022 meeting.

XIV. ADJOURNMENT

Dr. Griffin Rodgers

Dr. Rodgers expressed appreciation on behalf of the NIDDK to the Council members, presenters, and other participants. He thanked the Council members for their valuable input. There being no other business, the 220th meeting of the NIDDK Advisory Council was adjourned at 4:30 p.m. on September 7, 2022.

I hereby certify that, to the best of my knowledge, the foregoing summary minutes are accurate and complete.

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Date

Griffin P. Rodgers, M.D., M.A.C.P.
Director, National Institute of Diabetes and Digestive and Kidney Diseases, and
Chairman, National Diabetes and Digestive and Kidney Diseases Advisory Council