

**National Institutes of Health (NIH)
National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)**

**Network of Minority Health Research Investigators (NMRI)
15th Annual Workshop**

**DoubleTree Hotel Bethesda
Bethesda, Maryland
April 27–28, 2017**

Draft Meeting Summary

Thursday, April 27, 2017

INTRODUCTIONS

Winnie Martinez, Program Officer, NIDDK, NIH

Lincoln Edwards, D.D.S., Ph.D., University President and Professor, Northern Caribbean University

Ms. Winnie Martinez welcomed the participants to the 15th Anniversary workshop of NMRI and thanked the members of the Planning and Oversight Committees for their continued commitment and time to organize these meetings. She remarked that the Network has grown to 584 members with more than 700 meeting participants over the past 15 years, after having started with 30 members and 50 participants at the inaugural workshop in 2002. To date, the database indicates that 20 percent of NMRI's members are professors or senior investigators, 22 percent are assistant professors, and 1 percent are postdoctoral researchers. Recognizing that the member representation is not being fully captured, Ms. Martinez encouraged members to update their NMRI profiles to maintain a current and accurate status of the Network.

Dr. Lincoln Edwards, chair of the NMRI Planning Committee joined Ms. Martinez in welcoming participants to the 15th NMRI Anniversary celebration—the growth and achievements of the Network have been exemplary. He expressed appreciation to Ms. Martinez, the senior members, and sponsors, as well as to NMRI's committees for ongoing support of the Network. Dr. Edwards acknowledged and encouraged new members to engage with senior members.

The NMRI was established in 2002 by the Office of Minority Health Research Coordination (OMHRC) at the NIDDK. Dr. Edwards acknowledged the leadership of NMRI: Dr. Griffin P. Rodgers, Director, NIDDK; Dr. Lawrence Agodoa, Director, OMHRC; and Ms. Martinez, Program Director, OMHRC. NMRI's members are researchers and technical personnel interested in minority health research, including individuals from traditionally underserved populations. The fourfold mission of the NMRI is to (1) encourage minority health investigators to be researchers in fields of interest to the NIDDK; (2) promote two-way communication between members of the NMRI and the NIDDK; (3) gather recommendations and strategies to enhance opportunities for and support of groups underrepresented in biomedical research; and (4) advance scientific knowledge and contribute to the reduction and eventual elimination of racial and ethnic health disparities. NMRI's leadership has the following expectations of the Network: consistent reporting of publications, grants, presentations, promotions and tenure; feedback via post-meeting evaluations and surveys; recruitment of one or more members per year to the Network;

facilitate establishing NMRI chapters; encourage one or more professional societies to support the Network; and attend annual and regional meetings.

Dr. Edwards congratulated NMRI members Drs. Dale Abel and Glenn Chertow on their induction into the National Academy of Medicine and Dr. Patricia Heyn on being inducted into the American Congress of Rehabilitation Medicine and the Gerontology Society of America. He asked participants to join in a moment of silence in the memory of Dr. Sherilyn Gordon Burroughs, who had been a member of the NMRI and strong supporter and leader of undergraduate medical education. Dr. Edwards invited meeting participants to introduce themselves.

KEYNOTE SPEAKER

NIH Addresses the Science of Diversity: Where are we now?

Hannah Valantine, M.D., Chief Officer for Scientific Workforce Diversity, NIH

Dr. Hannah Valantine lauded the success of the NMRI and provided an update on NIH's approaches to address the science of diversity. These approaches address, in depth, the four cross-cutting diversity challenges: (1) science of diversity; (2) recruitment and retention; (3) sociocultural factors; and (4) sustainability fundamentals and models. She called attention to the 2012 report titled "Race, Ethnicity, and NIH Research Awards," which revealed that African-American applicants were 50 percent less likely to receive NIH investigator-initiated research funding than Caucasian applicants. Dr. Francis Collins, Director, NIH, acted promptly to address these findings by establishing a Biomedical Workforce Working Group within the Advisory Committee to the Director (ACD). The Working Group, as charged, developed recommendations for immediate and long-term strategies, which included recruitment of an active biomedical researcher with commitment to diversity and strong credibility in the academic community—this led to the establishment of the NIH Scientific Workforce Diversity (SWD) Office, which is charged to coordinate diversity programs across the NIH.

Dr. Valantine was recruited by Dr. Collins, in 2014 to become NIH's first Chief Officer for Scientific Workforce Diversity, as well as Senior Investigator of the Laboratory of Organ Transplant Genomics (LoGT) at the National Heart, Lung, and Blood Institute (NHLBI). Her work focuses on using cell-free DNA as a detection biomarker for heart transplant rejection. Prior to coming to the NIH, Dr. Valantine was Professor of Medicine in the Division of Cardiovascular Medicine and Director of Transplantation Research at Stanford University. She reflected on her childhood years growing up in Banjul, Gambia, being educated in London, England, and her first experiences as the only student of color in her class. Overcoming challenges of diversity and inclusion, Dr. Valantine successfully matriculated through college and medical school in the United Kingdom. It was during her medical residency and training in cardiology that she developed a desire to work in the field of transplantation medicine. She then moved to the United States for advanced cardiology training in a postdoctoral position at Stanford University, which led to her becoming Assistant Professor in the Cardiology Division at Stanford and then rising through the academic ranks to full professor. Recognizing the need to foster collaboration in transplantation research, in June 2015, Dr. Valantine established the Genome Research Alliance for Transplantation (GRAfT), an NHLBI-sponsored consortium of seven thoracic transplant programs. She remarked that more than 30 percent of the active transplant recipients are African Americans, which will allow investigators, for the first time, to identify transplant-related health disparities in this population and gain insight into the observed differences in outcomes between racial groups. In addition, a biorepository has been established to support the GRAfT and is being maintained by the LoGT.

Dr. Valantine explained that diversity matters to the NIH for many reasons, which include ensuring fairness and equality in biomedical research opportunities to leverage the entire U.S. intellectual talent

pool and the impact of workforce diversity on health disparities. Furthermore, studies have shown that diversity in teams establishes new perspectives on research and capitalizes on increased opportunities for excellence, creativity, and innovation, and broadens the scope of inquiry rendering more solutions to complex problems of health and disease. To emphasize its stance on why diversity matters, the NIH has incorporated into its fiscal year (FY) 2016–2020 NIH-Wide Strategic Plan the principle of enhancing stewardship, which includes increasing workforce diversity. For example, capturing the benefits of additional diversity identifications (e.g., thinking style, experiences, and skills) for underrepresented populations for U.S. biomedical, clinical, behavioral and social science research into funding opportunities would be a proxy for cognitive diversity, but the lack of diversity across the biomedical career path from training and early career to tenured faculty remains a challenge. Underrepresented groups (URG), regardless of gender, hold very few tenured faculty positions—this is a pattern the NIH is committed to improving through the mission of the SWD.

Numerous reports demonstrating the science of diversity have concluded that diversity in teams is more likely to give the diverse perspective and approach essential to solving the complex problems of health. For example, Dr. Scott Page, University of Michigan at Ann Arbor, summarizes in his book, *The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies*, where case studies and mathematical modeling demonstrated that better problem solving results from a larger informational or cognitive space. Dr. Samuel Sommers in the 2006 report titled “On Racial Diversity and Group Decision Making: Identifying Multiple Effects of Racial Composition on Jury Deliberations” showed that a wider range of information exchange in diverse groups resulted in more facts being cited, more discussion and fewer errors in jury deliberations and decision making. To answer the question of whether these examples will address diversity and the quality of science, recent reports from the National Bureau of Economic Research that examined the ethnic identity of authors of more than 2.5 million scientific papers written by U.S.-based authors from 1985 to 2008 revealed that publications written by diverse groups received more citations and are published in journals with higher impact factors. Similar findings were noted in the report titled “Gender-Heterogeneous Working Groups Produce Higher Quality Science.” The NIH is planning to issue funding opportunity announcements (FOAs) to evaluate and recapitulate these findings to provide further evidence that diversity in teams increases the output to science.

Regarding recruitment and retention, NIH’s Intramural Research Program (IRP) has a range of targeted scientific opportunities to enhance intramural diversity in the biomedical sciences that engage youth beginning in high school and extend onward to postdoctoral studies. Although the NIH has made significant investments in undergraduate- and graduate-level programs to enhance diversity, the SWD identified gaps in the IRP pipeline that could be improved. Dr. Valentine and the SWD developed a recruitment tool to search for candidates at the postdoctoral, assistant professor, associate professor, and full professor levels. Using this tool to search a number of scientific databases, the NIH identified junior and senior career stage candidate pools to expand diversity in the biomedical sciences. To foster outreach and promote knowledge and awareness about scientific career opportunities in the IRP, the NIH and the SWD Office established the NIH Future Research Leaders Conference, which is a trans-NIH effort to engage talented early-stage biomedical and behavioral scientists from diverse backgrounds. Other scientific organizations could emulate this model. In addition, the Diversity Consortium Program (DCP) was established and supports three components: the **Building Infrastructure Leading to Diversity** (BUILD), National Research Mentoring Network (NRMN) for Diverse Biomedical Workforce programs, and the Center for Evaluation and Coordination (CEC). The latter is a highly innovative approach that will utilize multiple methods to evaluate the efficacy of the range of interventions within and across BUILD institutions. The BUILD program is being implemented at 10 academic institutions, and the hypotheses that will be tested include stereotype threat and critical race theory. The NRMN program will conduct guided virtual mentorships and offer grant writing and coaching tools.

Sociocultural factors, such as stereotypes regarding a “typical scientist,” have played a significant role in implicit bias. For example, a recent report of two independent studies showed that students were more likely to rate individuals with feminine appearance, mostly women, as early childhood educators and not scientists than they were males, thus implying that males are regarded as having the face of a scientist. This has important implications for the decision-making process in regard to funding and biomedical research positions. Nevertheless, recent reports have shown that with intervention and education on bias, these habits can be broken. The NIH is in the process of testing interventions and educational initiatives to circumvent bias in the IRP, including the Implicit Bias Education and Research program that is designed to raise awareness of implicit bias and reduce its effect on the candidate search process. The SWD Office has developed implicit-bias education modules and provides scientific evidence of how such bias may affect judgements and decision making in scientific contexts.

A key pathway into sustainability in the biomedical workforce is the NIH independent (i.e., R01) research project grant (RPG). Referring to the 2012 report on racial and ethnic disparities in NIH research awards, Dr. Valentine pointed out the ACD’s recommendation to the NIH to carefully evaluate these findings, the causes, and to develop interventional strategies to prompt change. Thus, in a 1-year period, a taskforce composed of several NIH Institute directors evaluated the R01 review process at all stages, from submissions to funding, for awards made in FYs 2011–2015. This analysis showed that the relative gap was slightly lower than that of FYs 2000–2006; however, there was multifactorial disparity at each stage in the review process; African American scientists constituted only 1.5 percent of the RPG applicant pool. In time, the NIH expects that the BUILD and NRMN programs will help to resolve the low applicant pool by using evidence-based approaches for mentored research experiences that will enhance diversity among students and trainees across the biomedical career path. In addition to these longer term approaches, NIH has embarked on immediate actions that involve targeted interventions to enhance R01 submission and resubmission rates, as well as mentoring and coaching for grant preparation. Although resubmissions of unfunded grants are 30 to 50 percent more likely to be funded, data show that the resubmission rates for African American scientists were lower than for other groups.

NIH’s integrated national strategy for scientific workforce diversity has an overarching goal to eliminate transition barriers and achieve sustainable transformation in scientific workforce diversity. In so doing, this strategy will identify gaps and programs that are needed and leverage existing programs to achieve this goal. The NIH envisions establishing a model program, tentatively called Hubs of Innovation and Research in Scientific Workforce Diversity.

Discussion

A meeting participant asked whether the NIH could address the issue of academic background and the role it has on resubmissions among African American scientists. Applying for smaller grants might provide a scientist the protective time they would need for the larger funding opportunities. Dr. Valentine replied that the NIH has learned from applicant interviews that a lack of protective time weighs heavily on their grant resubmission rates. She called attention to the high-priority and short-term project award, R56, which has protective time built into its framework. Also, academic institutions should consider ways to provide protective time to early career investigators.

When asked about the diversity of the Center for Scientific Review (CSR) Study Section reviewers, Dr. Valentine responded that the CSR Study Section rosters reflected the diversity of that particular scientific discipline at the faculty level. Recognizing the challenges in junior and senior career faculty positions and URG, the NIH has implemented an Early Career Reviewer Program, and URG comprise 20 percent of that pool. The SWD Office is in the process of evaluating whether bias exists in the peer review process by conducting a study of scoring of redacted applications from all racial and ethnic groups. These results should provide insight into the impact of bias in the peer review process.

Experienced participants explained that the Minority Supplements, which should be advertised as competitive funding mechanisms, allow scientists protected time to collect preliminary data and asked whether this funding mechanism was being broadly utilized among URG. Dr. Valentine commented that Administrative Research Supplements to Promote Diversity in Health-Related Research are being used to support African American and Hispanic scientists, although not to the full extent possible. These supplements were not being tracked, and analysis is needed to determine the correlation of R01 awards to the Diversity Supplements. For example, the National Institute of General Medical Sciences and the National Institute on Aging found that retrospectively, these supplements played a significant role in retaining URG in the academic setting; 60 percent of the scientists supported by Diversity Supplements from those Institutes remained in academia. Going forward, the NIH will assign recipients an identification number to track their progress and career paths, instead of collecting those data retrospectively.

Participants encouraged the NIH to consider ways to engage diversity and inclusion officers and other senior members of academic administrations to provide input on biomedical research workforce diversity and to evaluate the evidence that diversity matters. Dr. Valentine acknowledged that institutional change and engaging leaders is the pathway that will have the most impact on improving diversity in the biomedical workforce.

When asked about ways that the NIH will convey the message about workforce diversity issues to Congress, Dr. Valentine replied that biomedical research has always received bipartisan support and that ongoing effective communication with Congress on scientific progress is critical.

IMPACT OF THE NETWORK ON YOUR CAREER

Presentations by Selected Junior and Senior Members

Dr. Edwards invited senior NMRI members, Drs. Carlos Isales, Professor, Augusta University, and Michelle Harris, Associate Professor, University of the District of Columbia, to reflect on the impact that the Network has made on their career decisions. They will be followed by junior member, Dr. Leonor Corsino, Assistant Professor, Duke University Medical Center. Dr. Ketrell McWhorter, Postdoctoral Fellow, National Institute of Environmental Health Sciences (NIEHS), presented on behalf of Dr. Chandra Jackson, Earl Stadtman Investigator, NIEHS.

Dr. Isales thanked the NIDDK, the Planning Committee, and the NMRI for the opportunity to share his experience as a member of the Network. Dr. Isales explained how his perceptions on mentoring, biomedical research, and the NIH CSR Study Sections changed after engaging with the Network. A mentee (i.e., a postdoctorate, assistant professor, or associate professor) may encounter many types of mentors in the biomedical sciences, including (1) the detached observers who are not aware of or aligned with the mentee's professional challenges; (2) supervisory and strict individuals who are less likely to provide critical recommendations or advice; and (3) the informal casual resolvers who offer limited constructive criticism and guidance. He expressed appreciation to Dr. Agodoa, Ms. Martinez, and the NMRI for holding fast to its mission to encourage minority health investigators to be researchers in fields of interest to the NIDDK—the Network helps to build quality relationships with mentors who are purposely interested in the mentee's career. Dr. Isales next described how the Network helped him face the challenges of balancing the duties of being a new faculty member and setting up a new research program with other academic responsibilities. It is important to know when you have reached your maximum level of satisfactory performance, to know how to say “No” to new requests from the administration, and to remain confident that you have made the right decision. Before joining the NMRI, Dr. Isales viewed the NIH Study Sections and grant review process as a barrier to his success as a research scientist. After engaging with the Network, he realized that the NIH and its CSR are not adversaries but are very interested in researchers' being successful in funding their research ideas. In

closing, Dr. Isales summarized that the Network has been invaluable to him as a minority health research investigator in assisting with realistic goal setting, providing training, establishing supportive mentorship, and providing networking opportunities. He credits the NMRI as key to his accomplishments of rising through the academic ranks from assistant professor in 2002 to his current position of professor in the Department of Neuroscience and Regenerative Medicine at Augusta University.

Dr. Harris expressed gratitude and honor to be a member of the NMRI and serve among great scientific scholars and health researchers, such as Dr. Isales, who share their time and efforts unconditionally to support the Network. She reflected on her years as a doctoral student and the role of the Network in providing the necessary resources during her professional journey. Not being an obvious candidate for the NMRI in regard to research funding, Dr. Harris advocated for acceptance on the basis of in-kind support she received from the private sector and the Network credited those awards to her portfolio as external funding. After having received quality mentoring from the Network, Dr. Harris takes pride in serving as a mentor for new members, in this, her first year as a senior investigator. She also has supported the NMRI in other capacities, including Oversight Committee member and judge for scientific poster sessions and competitions. Attending this 15th Anniversary meeting has fostered a renewed commitment to the Network. Dr. Harris integrates research into the courses she teaches—a direct reflection of the impact that the NMRI has made to the training of new scientists. She believes that when you give of your time and energy to serve others, you receive bountiful growth and development for the years to come. Dr. Harris thanked Ms. Martinez and the NMRI for their unending support and encouraged new members to be active participants within the Network.

Dr. Corsino is a 10-year member of the Network and shared how this experience has shaped her career. The NMRI has allowed Dr. Corsino to meet, collaborate, and engage with other minority scientists on a professional and personal level. Words cannot express the heartfelt gratitude she has for the NIDDK, the Network, and its organizers—including Ms. Martinez—for providing an environment that fosters friendships with colleagues who are on similar paths working toward common goals. Dr. Corsino described her path to Assistant Professor, which began as a Fellow in clinical research; constant motivation from the NMRI has been encouraging and inspiring as she strives to reduce health disparities and achieve goals. Rekindled relationships from medical school and quality mentorship have all been possible because of the NMRI.

Dr. Ketrill McWhorter, Postdoctoral Fellow in the Social and Environmental Determinants of Health Equity Group, NIEHS, expressed appreciation to the NMRI on behalf of Dr. Jackson, her mentor, who could not attend today's session of the meeting. Dr. McWhorter remarked that her work with Dr. Jackson on type 2 diabetes and health disparities is a testament to the impact and reach of the Network. She shared some of Dr. Jackson's reflections on the NMRI and the support she has received since joining in 2013, including travel awards to the annual meeting, recognition for scientific achievements, and valuable advice from junior and senior members alike.

WELCOMING REMARKS AND ANNIVERSARY RECOGNITION AWARDS

Griffin P. Rodgers, M.D., Director, NIDDK, NIH

Dr. Rodgers welcomed participants to the 15th Anniversary NMRI workshop and remarked that the Network, as a signature program of the NIDDK, has inspired other NIH Institutes and Centers to establish similar programs. He echoed Dr. Valentine's comments on the power of networking and collaboration, adding that they achieve outstanding results when developed with the appropriate follow-up. Dr. Rodgers remarked that the Network extends beyond the NIH and NIDDK and noted that he has had the pleasure of meeting and working with many of NMRI's members, albeit engaging in committees, professional societies, and associations, including the National Medical Association, National Hispanic Medical

Association, and Society for Advancement of Chicanos and Native Americans in Science. Having long served as a member of the National Advisory Committee for the Harold Amos Medical Faculty Development Program, a Robert Wood Johnson Foundation (RWJF) program, and understanding this program's role in sustaining the scientific talent pool, Dr. Rodgers sees this as a mechanism for the RWJF and NMRI leaders to connect and expand on networks for minority health researchers and further develop senior investigators and leaders in the biomedical field. From its humble beginnings and first meeting in 2002, the NMRI has evolved into a Network of more than 500 investigators from almost 50 universities and centers. The annual workshop has been expanded to include regional meetings as well. Despite these accomplishments, representation remains a challenge at many academic institutions—the NIDDK NMRI remains a vital conduit to advocate for minority researchers and meritorious research. At this anniversary workshop, the NIDDK is celebrating 15 years of success and honoring those members whose outstanding participation and commitment have fostered the Network's growth and activities. Dr. Rodgers, accompanied by Ms. Martinez and Dr. Edwards, presented senior NMRI members with medallions in appreciation for their service.

SESSION I: ROUND TABLE DISCUSSIONS

Participants attended one of six round table discussions focused on various career-oriented topics. Meeting participants attended the session of their choice.

Table 1: Community-Based Participatory Research

Lovoria Williams, Ph.D., Associate Professor, Augusta University

Joyce Balls-Berry, Ph.D., Assistant Professor, Mayo Clinic

Participants were provided with introductory knowledge of Community-Engaged and Community-Based Participatory Research (CBPR). Topics covered included: principles of community-engaged research; creating, building, and sustaining a CBPR partnership; and Community-Patient Engaged Research (CPEP).

Table 2: Behavioral and Social Sciences Research

Nia Mitchell, M.D., Assistant Professor, Duke University School of Medicine

Patricia Heyn, Ph.D., Associate Professor, University of Colorado Denver, Anschutz Medical Campus

Participants discussed approaches and challenges associated with behavioral and social sciences research. Facilitators and participants suggested ideas to overcome these challenges, including ways to generate pilot data and peer-reviewed publications for grant applications with limited resources and infrastructure.

Table 3: Epigenetics Research

Pamela Shiao, Ph.D., Associate Dean, Augusta University

Participants were introduced to epigenetics, genomics, bioinformatics, metabolomics, and proteomics. Topics discussed included these emerging fields, as well as genomic computation and epigenetics analysis tools, and the available funding opportunities and training institutes.

Table 4: NIH Intramural Research

Roland Owens, Ph.D., Assistant Director, Office of Intramural Research, NIH

Participants discussed different research positions, including fellowships and other opportunities that are available within the NIH IRP. They also learned about the places the different positions are advertised, evaluation criteria, and competitive strategies to secure a research position or fellowship.

Table 5: Research Supplements to Support Diversity and the NIH Funding Mechanism

Robert Rivers, Ph.D., Program Director, NIDDK, NIH

This round table provided detailed descriptions of research supplements and tips on submitting an application to obtain a research supplement.

Table 6: Successful Approaches for Grant Funding

Cynthia Warrick, Ph.D., President, Society for Diversity in Biomedical Sciences

This round table discussed strategies for research development and research team participation to achieve success in grant funding.

SESSION II: ROUND TABLE DISCUSSIONS

Participants attended one of three round table discussions. Two sessions covered mock study sessions for different types of NIH awards—R01 Basic/Clinical and K01 Basic/Clinical—and during these sessions, session leaders were given sample grant applications to review and critique. A third session discussed grant sources for non-NIH behavioral and social sciences research.

Mock Study Section 1: R01

Francesco Villarreal, M.D., Ph.D., Professor, University of California, San Diego

Ann Jerkins, Ph.D., Scientific Review Officer, NIDDK, NIH

Mock Study Section 2: K01 Awards

Nia Mitchell, Ph.D., Assistant Professor, Duke University School of Medicine

Michele Barnard, Ph.D., Scientific Review Officer, NIDDK, NIH

Non-NIH Behavior and Social Sciences Research (BSSR) Grant Sources

Patricia Heyn, Ph.D., Associate Professor, University of Colorado, Anschutz Medical Campus

RESEARCH APPLICATIONS IN BIOMEDICAL INFORMATICS

Timothy Huerta, Ph.D., Associate Professor, The Ohio State University College of Medicine

Dr. Timothy Huerta began his presentation on research applications in biomedical informatics by concisely defining biomedical informatics as the study of the manner in which biomedical data are used to improve human health. Biomedical informaticists work along the data continuum to extract patterns relevant to health-related issues. He next described the five “Vs” of data that distinguish biomedical informatics from others: velocity, veracity, volume, variety, and value. Integrated technologies that allow individuals to engage in managing their health are an example of the type of challenges that create the need for biomedical informatics. For example, Johns Hopkins University’s Corrie Health team, in collaboration with Apple Inc., developed Corrie (*cor* is Latin for heart), a cardiology CareKit computer application (app) that is connected to the Apple Watch to collect biometrics data in real-time (i.e., veracity). This device has the capacity to transmit data at 1 to 10 times per second (i.e., velocity), which is an overwhelming amount of information or volume. These types of devices and patient portals collect large volumes of health information data, but they may not always be of value to the health care organization.

Dr. Huerta explained that biomedical informatics involves three skills: data mining, domain experience, and statistics, including graph theory and network analysis. The biomedical informaticist frequently relies

on clinical domain experts who are experienced with health issues to understand the context and meaning behind the data. Research applications in biomedical informatics cross-cuts these three skills to study biomedical information, particularly those held in computer systems, from the bench to the bedside. The challenges lie in determining ways to build, access, experience, engage, and find patterns in the data, of which there is not one single framework. He described current Ohio State University projects that are research applications of biomedical informatics: (1) a shared decision-making tool that is an extensible platform to offer a single resource for physicians to understand evidence-based assessment of risk while also providing patient-centered materials that support the provision of care; (2) surveillance “hot spotting” of hospital-acquired infections to use electronic medical records to explore real-time results and recognize concerning trends sooner, so that clinicians can implement timely and effective interventions; and (3) a telemetry and alarms project to help clinicians focus on meaningful events, instead of the white noise sometimes caused by alarms. Opportunities for clinicians interested in research involve identifying questions that address gaps in knowledge and working with biomedical informatics experts to resolve them. Funding agencies readily support solving these types of problems to address gaps in health care.

Discussion

When asked about the informatics used in the telemetry and alarms project to control white noise, Dr. Huerta explained that oxygen monitors arriving from a distributor are typically set to alarm at 95 percent, which is not clinically relevant. After determining that lowering this set point did not have an adverse effect on patients, the monitors were reprogrammed to alarm at 80 percent, which decreased the noise by half.

A meeting participant asked how biomedical informatics could be used to resolve technology, availability, and data access issues. Dr. Huerta clarified that the work in progress at the Ohio State University to address technology disparities suggests that the problems are related to awareness, rather than access. Clinicians currently do not have the tools to use the data being created by patients nor are they aware of the diversity of self-managed health apps available.

In response to a query on the use of discrete data in real-time decision-making platforms to provide recommendations for health care providers, Dr. Huerta explained that approaches like control charts can reveal the trend of occurrences to inform the necessary intervention. Researchers must collaborate to identify the appropriate measurement models aligned with the problems that are being addressed.

A participant questioned the use of data for biomedical informatics and the governing rules per HIPAA and IRB approvals. Dr. Huerta explained that these concerns are addressed by the domain experts—usually a collaborative team of researchers—when patient data are involved. Testing of solutions can be explored using simulated data prior to an implementation, and that process can help to identify issues where HIPAA is relevant. Most research applications in progress at the Ohio State University are developed with the help of simulated models.

PARALLEL SESSIONS

Two parallel sessions provided the opportunity for participants to engage in career development activities. The sessions were intended to allow informal, interactive discussions among participants. Meeting participants attended the session of their choice.

Challenges and Opportunities in Endocrinology and Nephrology

Carlos Isales, Ph.D., Professor, Augusta University

Ayotunde Dokun, Ph.D., Associate Professor, University of Tennessee Health Science Center

Crystal Gadegbeku, M.D., Professor, Temple University School of Medicine

Dr. Isales, who studies the impact of nutrients on stem cells and aging, opened the session by discussing the challenges and opportunities in endocrinology. He noted the increase in patients with endocrine-related illnesses, which is partly due to the high prevalence of type 1 and type 2 diabetes. Patients diagnosed with type 1 diabetes are experiencing complications from obesity, which is not the normal phenotype. To further complicate matters, diabetes research is underfunded when compared to other illnesses. The opportunities for endocrine care and research are significant, but the limited number of models—cell culture or animal—that can recapitulate the endocrine system poses a challenge for investigative research.

Dr. Ayotunde Dokun currently runs an R01-funded translational research laboratory that focuses on understanding the molecular mechanisms of vascular complications and diabetes and remarked that circumventing obesity-related complications in diabetic patients is the overarching challenge in endocrine research. Clinical studies have shown that lifestyle interventions can reduce the progression from a prediabetic to a diabetic condition, but implementation research is needed to broadly implement these interventions into the community setting—the opportunities for minority health researchers should be focused in this area.

Dr. Crystal Gadegbeku has been involved in NIH-funded clinical and translation research and noted that Congressional appropriators and policymakers have shown an increased interest in the rising costs of treating end-stage renal disease. Recent reports revealed that the cost of care for dialysis treatment is more than the total NIH annual budget, yet investments in kidney-related research is less than 1 percent of NIH-funded research. Funding appropriations for kidney-related research are likely to increase and the potential opportunities to conduct novel research will follow suit. Participants were encouraged to investigate the existing funding mechanisms for kidney research, consider developing innovative research proposals, and engage mentors at all career stages.

Charting Your Course for Success

Ricardo Azziz, Chief Officer, Academic Health and Hospital Affairs, State University of New York

Dr. Ricardo Azziz discussed charting the course of success and leadership skills for young professionals. He pointed out that per the U.S. Census reports on educational attainment in the United States, 1.5 percent of the 215 million people ages 25 years or older had earned professional degrees and 1.9 percent had earned doctorate degrees, totaling 3.4 percent. Additionally, 0.77 percent and 0.91 percent of African Americans and 0.65 percent and 0.69 percent of Hispanics, had earned a professional or doctorate degree, respectively, compared to 1.7 percent and 2.05 percent of white non-Hispanics. Dr. Azziz remarked that by charting their course for success through hard work, perseverance, and leadership, the participants have beaten the odds. Leadership, as a learned skill, is about facing obstacles and standing tall in the midst of negativity and challenging times. He distinguished the duties of administrators and managers from those of leaders. Leaders, Dr. Azziz emphasized, do the following:

- Provide a vision.
- Lead and manage change.
- Interpret the environment.
- Empower and create teams.
- Engage communities.
- Model good behavior.

Participants were enlightened by Dr. Azziz's personal story of success and his thoughts on how to invest in leadership development, why leadership is a privilege, and how networking and collaboration are key for transformative leadership.

MARCO CABRERA POSTER AND NETWORKING SESSION

All meeting participants were invited to view the posters submitted to the NMRI 15th Annual Workshop and to converse with their presenters. Judges examined the posters and discussed the described research with their presenters. Winners were selected for each of three categories—Basic Science, Translational Science, and Clinical Science—and awards were presented to the winning recipients in the final session of the workshop. (See “Poster Session Awards.”)

NMRI 15TH ANNIVERSARY RECOGNITION

The Network paid tribute to Dr. Marion Sewer who was an active member of NMRI and was known for her passion for improving diversity in science.

DR. MARION SEWER HONORARY LECTURE OF THE NETWORK OF MINORITY HEALTH RESEARCH INVESTIGATORS

NMRI: Creating Your Future, Being Mentored, and Becoming a Mentor

Eddie Greene, Ph.D., Associate Professor, Mayo Clinic

Dr. Eddie Greene, Associate Professor of Medicine, Department of Medicine, Nephrology, and Hypertension, Medical Director, Office of Diversity in Education, Mayo Clinic at Rochester, presented the inaugural Dr. Marion Sewer Honorary Lecture. He pointed out that two of the founders of the Mayo Clinic, Drs. William and Charles Mayo, believed that the needs of the patient come first; he shares this belief. Dr. Greene reflected on his experiences of being mentored and becoming a mentor, and emphasized several key points in his presentation. First, NMRI participants are the future, and opportunity will knock. He urged the audience to be resilient and to give back when they are at the pinnacle of success. Those who practice servant leadership will be emulated and followed. The destination and journey are equally important, but critical to the journey is recognizing that mentors are essential to guide the initial steps on the path to destination. Engaging with a highly functional team is more satisfying and makes the collaboration more effective.

Dr. Greene, a strong advocate and longtime NMRI supporter, provided supporting arguments for choosing the Network. The NMRI is the progenitor of a collaborative approach to team work and team science in the modern world of biomedical research. The opportunity exists to learn about others’ research, share ideas, discuss approaches for novel projects, develop hypotheses and experimental designs, and establish new relationships and ongoing collaborations. The NMRI and other strong support groups build diversity and inclusion capacity for biomedical research teams, as well as educational and clinical structures and processes. Research to eliminate the differences in health status of different groups of people, or health disparities, is one opportunity for clinical investigators. For example, health disparities in the incidence and prevalence of end-stage renal disease have been identified and are recorded in the 2014 Annual Data Report from the United States Renal Data System.

Mentors make or can make a difference at many stages in one’s career, beginning in elementary and high school, on through junior faculty and beyond. People encounter different types of mentors throughout this journey and career continuum. Dr. Greene reflected on his own journey to becoming a minority physician, biomedical researcher, and clinical investigator, which began in Belzoni, Mississippi. He thanked his first mentors, his parents, who gave him a start on life and sparked his intellectual curiosity. Dr. Greene then acknowledged his other mentors from undergraduate studies, his inaugural NMRI membership, and forward. He emphasized the importance of seeking and selecting the right mentor and discussed the

mentee's responsibilities, which include initiating the mentor-mentee relationship. Mentors do matter and do make a difference, and the NMRI fosters good mentoring relationships. Mentoring begins with teamwork, which involves pioneers, guardians, drivers, and integrators—people should choose a role on the team and make a difference. Dr. Green highlighted important collaborations and the impact they have made on his career. Good collaboration networks and team dynamics are effective in building research portfolios.

As clinicians and health researchers, our world and our patients are diverse. Developing a diverse educational, research, and clinical environment throughout the biomedical workforce will increasingly enable this community to attract the best and most talented people as colleagues. Diversity also is important to help resolve health disparities. Dr. Greene expressed his sincere appreciation to the NIDDK and NMRI for their leadership and strong support of minority researchers and closed by reiterating to participants what he had said at the beginning of his speech: You are the future. Opportunity will knock. The destination and journey are equally important. Be resilient. Give back when you are at the pinnacle of success. Practice servant leadership and you will be emulated and followed.

Friday, April 28, 2017

MENTOR/MENTEE SESSION

Junior investigators who had signed up for this session had the opportunity to meet with one of several senior NMRI investigators who offered to serve as mentors. During the session, each mentor hosted a round table discussion with his or her mentees, answering questions and providing advice.

ROLE OF SCIENTIFIC SOCIETIES AND PROFESSIONAL ORGANIZATIONS

American Society of Nephrology (ASN)

Deidre Crews, M.D., Incoming Chair, Diversity and Inclusion Committee, ASN

Dr. Deidre Crews provided an update on the ASN's efforts to address diversity and inclusion in the Society, noting that the ASN enterprise includes both the Foundation for Kidney Research and the Kidney Health Institute. The ASN Diversity and Inclusion Work Group was established in December 2013 and after 4 successful years of accomplishments, including establishing the ASN-Harold Amos Medical Faculty Development Program (AMFDP) Award in 2016 and providing travel awards to 55 NMRI workshop participants from 2015 to 2017, it transitioned into the Diversity and Inclusion Committee in January 2017. She acknowledged the committee members, many of whom also are NMRI members. Dr. Crews detailed the committee's priorities, highlighting the update to the eligibility requirements for the ASN-AMFDP award to include Ph.D.-level nurses. In 2014, at the annual Kidney Week meeting, the ASN expanded on its diversity and inclusion efforts by establishing the Michelle P. Winn M.D. Endowed Lectureship in memory of the Duke University Medical School professor and nephrologist. Dr. Crews conveyed ASN's commitment to career development for kidney professionals and highlighted efforts to support students, trainees, and early career professionals. The ASN values statement on diversity and inclusion embodies inclusiveness, mentorship, health equity, patient advocacy, and engagement. Additional information on grants, funding, and the Diversity and Inclusion Committee can be accessed at the ASN website.

American Society for Bone and Mineral Research (ASBMR)

Nicole Wright, Ph.D., Assistant Professor, The University of Alabama at Birmingham

Dr. Nicole Wright informed participants that ASBMR, with approximately 4,000 members, is home to the world's foremost bone, mineral, and musculoskeletal researchers and clinicians, 46 percent of whom are located outside of the United States, representing 60 countries worldwide. The Society's mission is to promote excellence in bone and mineral research to foster integration of basic and clinical science and facilitate translation of these sciences into clinical practice. In so doing, the ASBMR convenes annual and topical meetings and publishes the *Journal of Bone and Mineral Research (JBMR)* and *JBMR Plus*. In addition to specialized lectures and symposia, the annual meetings incorporate activities for minority researchers, which are planned by the ASBMR's Diversity in Bone and Mineral Research Subcommittee. Dr. Wright explained the membership benefits and encouraged the Network's members to explore the many ASBMR opportunities.

American Diabetes Association (ADA)

Allison McElvaine, Ph.D., Director, Research Communications, ADA

Dr. Allison McElvaine explained how the ADA, through its mission to prevent and cure diabetes and improve the lives of all people affected by diabetes, aims to address the prevalence, seriousness, health costs, and disproportionate effects of diabetes on minority populations. The ADA's 2017–2020 Strategic Plan is aligned to accomplish this mission and centers on three pillars: (1) Drive Discovery (through research), (2) Raise Voice (through advocacy), and (3) Support People (through professional and community resources). The ADA has invested more than \$770 million in diabetes research and supported 4,600 research projects. In 2016 alone, \$34.5 million was made available for research to support 378 projects that funded 351 individual investigators in more than 150 academic institutions and centers across the United States. Advances in biomedical research have resulted in improved treatments, the ADA's Standards of Medical Care in Diabetes, and reduced complications from the disease. Research programs include the Core Research Program, Collaborative Targeted Research Program, and Pathway to Stop Diabetes Initiative. Funding opportunities are available at all career stages and include minority undergraduate internships; postdoctoral and minority postdoctoral fellowships; junior faculty development awards; and innovative basic science, clinical, or translational science awards for junior and senior faculty. Detailed research program descriptions and submission deadlines can be accessed at the ADA website. In addition to funding, the ADA provides legal advocacy for persons reporting diabetes-related discrimination, as well as law enforcement training in the appropriate identification of diabetic emergencies. Dr. McElvaine encouraged participants to apply for grants, present and submit research findings at ADA's annual Scientific Sessions, volunteer to serve on committees, or become a diabetes advocate and support the ADA's mission.

Endocrine Society

Rocio Pereira, M.D., Assistant Professor, Joslin Diabetes Center

Dr. Rocio Pereira, former chair of the Endocrine Society's Diversity and Inclusion Committee, discussed the Society's resources for biomedical scientists and its activities related to minority populations. The Endocrine Society has more than 18,000 members who are medical doctors, researchers, scientists, and educators, located in 122 countries, with 40 percent of the membership being outside of the United States. Peer-reviewed publications include *Endocrine Reviews*, *Endocrinology*, and the *Journal of the Endocrine Society*. In 2014, the Endocrine Society held its inaugural Reducing Health Disparities summit and has since incorporated health disparities into many of the Society's activities, including the publication of feature articles. The society convenes an annual meeting, ENDO, and features Endocareers, which provides a mentor exchange program, in-training, and early career resources, as well as board certification training for clinical endocrinologists. The Endocrine Society awards program spans all career levels and includes ENDO travel awards, scientific achievement awards, summer research fellowships, and student and early career awards. In addition, the NIDDK-sponsored Future Leaders Advancing Research in

Endocrinology (FLARE) program to support training and endocrine research for URG is one of the Society's diversity initiatives. Workshops, internship paths, mentorship paths, and ENDO travel awards are components of the FLARE program.

Council on Undergraduate Research (CUR)

Liz Fray, Membership Coordinator, CUR

Ms. Liz Fray thanked NMRI organizers for the opportunity to present on CUR, a leading organization for undergraduate research. As a membership-based nonprofit organization with more than 12,000 individual members and approximately 700 academic institutional members, CUR has representation at more than 900 colleges and universities. CUR comprises 13 divisions, including health sciences, and individual members can choose a division of interest. The organization's mission is to support and promote high-quality undergraduate student-faculty collaborative research and scholarship. Five strategic pillars that are most important to this mission are (1) the integration of undergraduate research into curricula and coursework; (2) assessment of the impact of undergraduate research; (3) diversity and inclusion in undergraduate research; (4) innovation and collaboration in undergraduate research; and (5) internationalization (i.e., expanding the opportunities for research exchange internationally) and undergraduate research. Meetings for students and faculty and such services as nationally recognized awards, a mentor network, and an undergraduate researcher's registry are among the resources that CUR provides. Also, 2- to 3-day meetings, or CUR Institutes, are held on college campuses, during which time small groups meet to discuss an issue related to undergraduate research and faculty development. Institutes on proposal writing and beginning a research program in the natural sciences are planned for 2017. Participants were invited to visit the CUR website for additional details.

BUSINESS MEETING AND COMMITTEE REPORTS

Oversight Committee Report

Sylvia Rosas, Ph.D., Associate Professor, Joslin Diabetes Center

Dr. Sylvia Rosas reported on the activities and responsibilities of the NMRI Oversight Committee. The Oversight Committee has a broad mandate that includes facilitating the development of active mentoring relationships between senior and junior members; identifying new members and planning outreach to new organizations; establishing specific groupings of Network members by research/professional interest or geographical location; and coordinating with professional societies that host annual meetings attended by Network members with the potential goal of organizing an informal gathering at one of these meetings. The Oversight Committee is composed of 10 members and two *ad hoc* members who represent the varied constituencies of the NMRI, as well as representatives from the NIH. Dr. Rosas explained that the committee convenes by conference call every 3 months; the fourth meeting coincides with the annual meeting of the Network. She acknowledged the incoming chair, Dr. Rocio Pereira, and current members of the committee. Dr. Rosas discussed future plans and encouraged participants to consider joining. Dr. Pereira expressed appreciation to Dr. Rosas for her service to the committee and invited NMRI members to forward any comments or suggestions to her attention.

Planning Committee Report

Lincoln Edwards, D.D.S., Ph.D., University President and Professor, Northern Caribbean University

Dr. Edwards acknowledged the Planning Committee members and their role in planning and organizing the NMRI Annual Workshops. The Planning Committee convenes by conference call once each month to share and discuss ideas and make decisions by consensus and voting; the committee's final meeting coincides with the annual meeting of the Network. The priorities for the 2017 workshop and meeting were to provide opportunities for network and collaboration; honor senior members and those who have

made significant contributions to the development of the NMRI; and provide the necessary tools to inspire and empower participants to make tangible progress and achieve goals in their research and careers. The team, with the assistance of Ms. Martinez, worked together to achieve these priorities. Dr. Edwards noted that the NMRI leadership and the Committee listens and values attendees' feedback and emphasized the importance of completing the meeting survey. Twenty-nine new members are in attendance and presented at this 2017 Workshop, partly due to the efforts of the existing members to increase awareness about the Network. He expressed appreciation to senior NMRI members for their dedication and work in mentoring, reviewing abstracts, and providing advice on research proposals' specific aims. The 2018 Annual Workshop is being planned and is scheduled to be held in Bethesda, Maryland; the dates are to be determined. Dr. Jose Romero is the incoming chair of the Planning Committee.

NMRI Chapter Overview

Patricia Heyn, Ph.D., Associate Professor, University of Colorado Denver, Anschutz Medical Campus

Dr. Heyn provided an update on NMRI Chapter development and described the features of the draft application form, including the eligibility criteria. She pointed out that currently there are no active NMRI Chapters and encouraged members of the Network to consider establishing chapters at their respective institutions. NMRI chapters will adopt NMRI's fourfold mission, which Dr. Edwards had stated in his earlier remarks. Individual chapters will provide an opportunity to engage students early in their studies, and Dr. Heyn and others in the Network will assist those who are interested. Ms. Martinez explained that the NMRI is not exclusive to diabetes, digestive disease, or kidney researchers and is open to minority investigators working in other disciplines.

POSTER SESSION AWARDS

The workshop's three scientific presenters, who were selected from the pool of submitted abstracts, were presented with plaques commemorating their achievement. All the meeting participants who presented posters at this year's workshop were thanked for their time and willingness to share their research with the NMRI community. The three winners of the poster session awards were then announced and congratulated:

Basic Science Poster Award

Oreoluwa Adedoyin, Ph.D., Postdoctoral Fellow, The University of Alabama at Birmingham
"Lack of Heme Oxygenase-1 Increases Susceptibility to Ferroptosis in Proximal Tubule Epithelial Cells"

Translational Science Poster Award

Ketrell McWhorter, Ph.D., Postdoctoral Fellow, NIEHS
"Impact of Excessive Gestational Weight Gain and Prepregnancy BMI on the Prevalence of Large-For-Gestational Age Infants of Women With Type I Insulin-Dependent Diabetes"

Clinical Science Poster Award

Ebele Umeukeje, M.D., Professor, Vanderbilt University School of Medicine
"Increasing Autonomous Motivation for Phosphate Binder Adherence in End-Stage Renal Disease"

LUNCH KEYNOTE

Patient-Centered Outcomes Research Institute (PCORI) Disparities Research: Opportunities, Process, and Impact

Parag Aggarwal, Ph.D., Senior Program Officer, PCORI

Dr. Parag Aggarwal described PCORI, an independent research institution authorized by Congress in 2010, its research priorities, funding opportunities, and efforts to address disparities research. Governed by a 21-member Board of Governors representing the broader health care community, PCORI funds comparative clinical effectiveness research (CER) that engages patients and other stakeholders throughout the process. At PCORI, CER is patient-centered; seeks answers to real-world questions that matter to patients and other clinical decision makers; compares outcomes that matter to patients; and compares the effectiveness of two or more interventions known to have proven efficacies. PCORI is particularly interested in funding research that focuses on high-priority conditions that affect large numbers of people across a broad range of populations, placing a heavy burden on individuals, families, subpopulations, and society.

Dr. Aggarwal emphasized the importance of having a clear understanding of patient-centeredness (i.e., projects with outcomes that matter to patients) and patient and stakeholder engagement (i.e., patients and other stakeholders as research partners) when developing projects. From PCORI's perspective, there are numerous different stakeholders, and it has developed several structures to engage stakeholders, including but not limited to Merit Review Panels, Advisory Boards, Pipeline to Proposal Awards, Speakers Bureau, Ambassador Program, Engagement Awards, and various webinars and workshops. A valuable tool and resource for applicants applying for research awards is the engagement rubric, which can be accessed from the PCORI website.

PCORI's five national priorities for research are (1) Assessment of Prevention, Diagnosis, and Treatment Options; (2) Improving Health Care Systems; (3) Communication and Dissemination Research; (4) Addressing Disparities; and (5) Accelerating Patient-Centered Outcomes Research and Methodological Research. Since December 2016, these five programs have been merged into two programs: (1) Health Care Delivery and Disparities Research and (2) Clinical Effectiveness and Decision Science. This merging does not affect the five individual national priority areas or funding categories. To date, PCORI has funded more than 440 projects in 42 states plus the District of Columbia, and also in Canada, Sweden, and Italy, totaling \$1.6 billion in investments. Including stakeholder engagement awards and the coordinating center awards, more than 780 projects have been funded. The portfolio of funded projects stratified by health condition shows higher percentages of awards for mental and behavioral health-related projects, along with cancer, cardiovascular disease, and chronic conditions. Although diabetes is not the most studied health condition, PCORI supported 26 diabetes-related projects, totaling \$54 million in investments, and the majority of the projects focus on underrepresented populations. Similarly, PCORI has invested \$32.7 million to fund 12 kidney disease-related projects; again, these projects largely focused on underrepresented populations. The database of funded projects can be accessed and searched through the PCORI website.

Dr. Aggarwal detailed PCORI's initiatives for the Addressing Disparities National Priority. The mission is to reduce disparities in health and health care outcomes and advance equity in health and health care, with the guiding principle of supporting comparative effectiveness research that will identify the best options for reducing and eliminating disparities. The goals are to identify research questions, fund research, and disseminate promising best practices. PCORI's disparities research portfolio includes 67 funded projects and \$187 million in funding. Projects are being conducted in 21 states across the United States, plus the District of Columbia.

Aside from the stakeholder engagement awards, PCORI provides several different funding opportunities, which include the Broad PCORI Funding Announcements (PFAs) that are aligned with the national priority areas, Pragmatic Clinical Studies to Evaluate Patient-Centered Outcomes, and Targeted Funding Announcements, which are designed to address PCORI's highest priority questions. The PFAs support investigator-initiated research, and awards range from \$750,000 to \$3 million for a funding period of 3 years. Pragmatic Clinical Studies, which address critical evidence gaps in topics of special interest to stakeholders, are 5-year \$10 million projects. The PCORI research contracting process establishes a research contract, not a research grant as does the NIH. This mechanism allows PCORI to have more oversight on the project's performance, including evaluations of the completion of milestones and deliverables. Dr. Aggarwal described the application and merit review process, including the merit review criteria and the letter of intent requirements. He encouraged adhering to the PFA and application guidelines, contacting a program officer to answers questions on applying, and submitting early and on time.

Discussion

A participant asked about PCORI's ongoing operations, given the proposed changes to the health care system. Dr. Aggarwal responded that no changes are currently projected and that funded projects will continue to be supported, as well as open funding announcements. Congressional support for biomedical research remains strong, and PCORI's leadership is confident that this support will continue.

When asked about patient participation in the PCORI merit review process and whether other resources could be leveraged to increase the number of patients who provide input, Dr. Aggarwal explained that the review panel comprises a team of 15–25 people, including subject-matter experts, patients and other stakeholders. Normally, one patient is assigned for each application and commits to investing a considerable amount of time reviewing the application. Although finding patients to participate in the review process is a challenge and any ideas for improvement are welcome, keeping the size of the team to a manageable number helps facilitate the process.

A participant asked about the success rate for applications and the difference between the grant and contract funding mechanisms. Dr. Aggarwal responded that projects that score well could be funded even if the total awards are above the PCORI funding line for that particular cycle. For example, the quality of the research will affect the decision to fund potentially three projects versus funding two. PCORI uses the contract funding mechanism and projects are required to meet and achieve the fixed milestones and deliverables. Granting mechanisms appropriate the funds on preset cycles and performance indicators are evaluated.

When asked about projects that focused on biomedical informatics, Dr. Aggarwal replied that projects making use of patient-reported outcomes data and observational studies have been supported by PCORI.

SCIENTIFIC PRESENTATIONS

An Optimal Modifiable Lifestyle Risk Factor Score Is Associated with Lower Risk of Type 2 Diabetes Mellitus in African Americans: The Jackson Heart Study

Joshua J. Joseph, M.D., Assistant Professor, Werner Medical Center, The Ohio State University

Dr. Joshua Joseph presented on an optimal modifiable lifestyle risk factor score associated with lower risk of type 2 diabetes mellitus in African Americans. Reports on the prevalence and incidence trends for adults diagnosed with diabetes in the United States from 1980 to 2012 showed that the incidence rates among African Americans and Hispanics continued to increase while rates have plateaued among

non-Hispanic whites. Current interventions, such as the Diabetes Prevention Program, have demonstrated that lifestyle intervention (e.g., weight loss and physical activity) reduce the risk of developing diabetes by 58 percent. An analysis from the Multiethnic Study of Atherosclerosis (MESA)—investigating the relationship between physical activity, sedentary behavior, and incident diabetes in a multiethnic population—revealed that the effect of physical activity and sedentary behavior on incident type 2 diabetes was significant only for non-Hispanic whites but not multiethnic groups, including African Americans. Furthermore, assessments on the levels of ideal cardiovascular health (i.e., never smoked, total cholesterol less than 200 mg/dL, blood pressure less than 120/80 mm Hg, body mass index (BMI) less than 25 kg/m², physical activity more than or equal to 450 metabolic equivalent of task minutes per week, and a healthy diet score) showed that attainment of a greater number of ideal cardiovascular health factors was associated with a dose-dependent lower risk of incident type 2 diabetes mellitus. In addition, prior studies on modifiable lifestyle risk factors for incident diabetes, including the Cardiovascular Health Study initiated by the NHLBI and the NIH-American Association of Retired Persons Diet and Health Study, showed that higher levels of optimal modifiable lifestyle risk factors for diabetes were associated with significantly lower risk of developing diabetes mellitus. Although the outcomes were promising, these assessments, except for the MESA studies, were conducted in predominately non-Hispanic white cohorts and included the BMI in the combined modifiable risk factor group. Thus, the association of modifiable risk factors are less investigated in African Americans.

The research objective of this current study was to investigate the associations of combined modifiable risk factors (physical activity, television watching, dietary intake, sleep disordered breathing, and smoking) with incident diabetes in African Americans and the effect of baseline adiposity and glycemic status. Dr. Joseph and collaborators aimed to determine whether an optimal modifiable lifestyle risk factor score would be inversely associated with incident diabetes among African Americans. Data on modifiable risk factors were collected at three examination cycles in a population-based cohort of African Americans in the Jackson Heart Study: (1) 2000–2004 (i.e., baseline); (2) 2005–2008; and (3) 2009–2012. Incident diabetes (fasting glucose \geq 126 mg/dL, physician diagnosis, use of diabetes drugs, or HbA1c \geq 6.5%) was assessed over 12 years among adults without prevalent diabetes at baseline. Incidence rate ratios (IRR) were estimated using Poisson regression modeling adjusting for age, sex, education, current occupation status, systolic blood pressure, and body mass index (BMI). Modifiable lifestyle factors were combined in risk score categories of poor (0–3 points), average (4–7 points), or optimal (8–11 points).

Compared to a poor modifiable lifestyle risk score, an average or optimal score was associated with a 21 percent and 31 percent lower risk of diabetes, respectively. BMI and glycemic status at baseline modified the association of lifestyle risk score with diabetes. Among participants with BMI less than 30 kg/m², there was a 40 percent and 47 percent significantly lower risk, respectively, compared to a 10 percent and 17 percent non-significantly lower risk among participants with BMI of 30 kg/m² or more. For participants with normoglycemia (normal fasting glucose and HbA1c) at baseline, there was a 36 percent and 43 percent lower risk, respectively, compared to a 10 percent and 20 percent non-significant lower risk among participants with prediabetes at baseline.

The study concluded that modifiable lifestyle factors are associated with a lower risk of diabetes among African Americans, with greater effects among those with lower adiposity and normoglycemia. Lifestyle interventions to reduce obesity have focused on individuals with high BMI and/or prediabetes. This study suggests that African Americans at the lower end of the diabetes risk spectrum may derive significant long-term benefit from diabetes prevention strategies focused on the outlined modifiable lifestyle risk factors.

Dr. Joseph acknowledged his study collaborators: Drs. Justin B. Echouffo-Tcheugui, Sameera A. Talegawkar, Valery S. Effoe, Mercedes R. Carnethon, Willa A. Hsueh, and Sherita H. Golden and

Ms. Victoria Okhominia. He expressed appreciation to the staff and investigators of the Jackson Heart Study.

Discussion

A participant asked about the association of modifiable risk factors on incident diabetes in the Hispanic population. Dr. Joseph replied that the MESA study showed that attainment of a higher number of modifiable risk factors (e.g., smoking, cholesterol, blood pressure, BMI, physical activity, and healthy diet score) were associated with a lower risk of incident diabetes among Hispanic Americans, but the magnitude of reduction was less for Hispanic Americans than for non-Hispanic whites. This could suggest that early intervention and novel modifiable risk factors are needed.

Recognizing the association of genetic predisposition and risk factors for various diseases, a participant asked about the type of novel modifiable risk factors that would be considered for diabetes mellitus. Dr. Joseph described his work on generational stress and cortisol levels, which has shown an association between cortisol levels and the risk of developing diabetes mellitus. These studies suggest that cortisol could be a novel modifiable risk factor.

Diabetes Educators and In-person Culturally Competent Medical Interpreters Collaborative: A Diabetes Education Group for Hispanic Patients with Limited English Proficiency

Ariana Pichardo-Lowden, M.D., Assistant Professor, Milton S. Hershey Medical Center, Pennsylvania State University

Dr. Ariana Pichardo-Lowden presented on the Diabetes Educators and In-person Culturally Competent Medical Interpreters Collaborative and diabetes education for Hispanic patients with limited proficiency in English. The prevalence of diabetes is increasing in the Hispanic population and those diagnosed with type 2 diabetes show poor adherence to the ADA-recommended guidelines for self-management. Proper diabetic self-management skills and behaviors are necessary for glycemic control and to avoid complications. Further complicating matters is the barrier to speak and understand English and the fact that members of the Hispanic population are less likely to afford medical insurance coverage. This inadequate access to health care—combined with cultural, socioeconomic, and linguistic barriers—contributes to the existing health disparities in the Hispanic population. In addition, diabetes educational programs that are available to patients with limited English proficiency often have limitations. For example, telephone translation services often restrict effective communication in patient-educator interactions, and educators may have a limited understanding of the impact of culture on lifestyle, dietary habits, treatment adherence, disease management, and coping. Studies have shown that bilingual health care providers and trained in-person interpreters positively affect the satisfaction, quality of care, and outcomes of patients with limited English proficiency.

The purposes of this educational program are to develop and implement a learning-centered and culturally competent Spanish diabetes curriculum for Hispanic patients with low English proficiency and to assess its impact on patients' self-management and diabetes control. The course consists of three 1-hour diabetes educational sessions occurring over a 9-month period. Hispanic patients who have limited English proficiency, are newly diagnosed with diabetes, or have glycated hemoglobin (HbA1c) levels of 8 percent are being enrolled for the class. Students will engage in active learning activities related to diabetes self-management, which is focused on the seven goals of American Association of Diabetes Educators (AADE7). The AADE7 address healthy eating, increased activity, glucose monitoring, taking medications, problem solving, reducing risks, and coping. The instructional methods for this program are aligned with the L. Dee Fink Taxonomy of Significant Learning, which includes foundational knowledge, application, integration, human dimension, caring, and learning how to learn. Diabetes educators, the Milton S. Hershey Medical Center's Division of Endocrinology and Family and Community Medicine

Program faculty, and the Latino Medical Student Association at the Pennsylvania State University College of Medicine are collaborating to design and implement the educational program.

The in-person interpreters are certified and trained on language interpretation and cultural awareness. The evaluation of the quality of instruction will be conducted after each session through debriefings by diabetes interpreters. Program assessments, measures of health-related outcomes, and evaluation of health outcomes are included in the program. Dr. Pichardo-Lowden noted that the program is in the early phases and the curriculum is being implemented. She anticipates that the program will positively impact four important domains: (1) access to diabetes education at the Hershey Medical Center; (2) patients' satisfaction related to diabetes education; (3) improvements in self-management skills or behaviors; and (4) diabetes control among limited English proficiency Hispanic patients.

Discussion

A participant congratulated Dr. Pichardo-Lowden on highlighting this topic and looks forward to the outcomes of the study.

When asked how the cultural competency of the in-person interpreters would be evaluated, Dr. Pichardo-Lowden explained that the interpreters are bilingual and are certified by the Pennsylvania State University College of Medicine's Medical Interpretation course. They also will be trained in cultural competency.

Mitochondrial Protection in Aged Kidneys Reduces Parietal Epithelial Cell Senescence

Mariya Sweetwyne, Ph.D., Acting Instructor, University of Wisconsin

Dr. Mariya Sweetwyne presented her research demonstrating that the mitochondrial protection in aged kidneys reduces parietal epithelial cell senescence. Aging is a significant risk factor for chronic kidney disease (CKD). It is estimated that 25 percent of Americans over the age of 65 are diagnosed with CKD. Aged kidneys, even in healthy adults, exhibit nephron loss and glomerulosclerosis. Kidneys are mitochondrial rich, and mitochondrial dysfunction has been proposed as a mechanism contributing to renal aging. This suggests that the mitochondria may play a role in the underlying changes of the aging glomerulus and the induction of cellular senescence. From prior studies, Dr. Sweetwyne and colleagues could show that the mitochondrial-targeted peptide, SS-31, improved age-induced glomerulosclerosis. Also, parietal epithelial cell (PEC) activation was reduced, and podocyte and endothelial cell integrity were improved. This current study will investigate the mechanism associated with these changes.

The objective was to assess the signs of oxidative stress and cellular senescence in aged SS-31 treated PECs. Results showed that Nox4, a reactive oxygen species-generating enzyme, was reduced in SS-31 treated PECs, and SS-31 treatment significantly reduced the presence of SA- β -gal, a senescence marker, in all renal compartments. The expression of p16 also was reduced in PECs of SS-31 treated animals, but p21 expression increased. Further examination of glomeruli in serial sections revealed a differential expression of p16 and p21 in the PEC at the Bowman's capsule, with cells expressing one or the other protein, but not both. In conclusion, mitochondrial protection is evident in aged kidneys, and senescence is regulated through a p16/p21 interaction, which is specific to the PEC.

Discussion

A participant suggested that this experimental design would be one way to investigate natural products that have shown protective effects on the aging kidney. Dr. Sweetwyne agreed that, in general this design would be a good model, but suggested careful attention when using many of the more robust CKD models.

NEXT STEPS AND ADJOURNMENT

Lincoln Edwards, D.D.S., Ph.D., University President and Professor, Northern Caribbean University

Dr. Edwards thanked participants for attending this 15th Anniversary NMRI workshop and meeting. He expressed appreciation to CUR for sponsoring the 2017 NMRI Network Reception and the professional societies—ASN, ASBMR, ADA, and the Endocrine Society—for sponsoring travel awards to the NMRI 15th Annual Workshop.

Ms. Martinez thanked everyone for attending and noted that the NMRI West Regional meeting is being planned.