DEPARTMENT OF HEALTH AND HUMAN SERVICES
NATIONAL INSTITUTES OF HEALTH
NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES

MINUTES OF THE ONE HUNDRED SIXTY-FIRST MEETING OF THE NATIONAL ADVISORY ENVIRONMENTAL HEALTH SCIENCES COUNCIL

September 15-16, 2020

The National Advisory Environmental Health Sciences Council convened the open session of its one hundred sixty-first regular meeting on September 15 and 16, 2020 as a Zoom virtual meeting. The closed session of the meeting was held earlier in the day September 15.

The meeting was open to the public on September 15, 2020 from 11:00 a.m. to 2:15 p.m., and on September 16, 2020 from 10:00 a.m. to 2:45 p.m. In accordance with the provisions set forth in Section 552b(c)(4) and 552b(c)(6), Title 5, U.S. Code and Section 10(d) of the Federal Advisory Committee Act, as amended (5 U.S.C. Appendix 2), the meeting was closed to the public on September 15, 2020 from 10:00 a.m. to 10:45 a.m. for consideration of grant applications. Notice of the meeting was published in the *Federal Register*. Dr. Rick Woychik presided as Chair.

Participating Council Members

José Cordero, MD, MPH
Gary Ellison, PhD, MPH (*ex officio*)
Suzanne Fitzpatrick, PhD (*ex officio*)
Andrew Geller, PhD *(ex officio)*
Lynn Goldman, MD, MPH
Irva Hertz-Picciotto, PhD
Shuk-Mei Ho, PhD
Terrance Kavanagh, PhD
Katrina Korfmacher, PhD
Edith Parker, DrPH
Trevor Penning, PhD
Marla Pérez-Lugo, PhD
Brad Racette, MD
Susan Schantz, PhD
Andy Shih, PhD
Patrick Sung, DPhil
Robyn Tanguay, PhD
Karen Vasquez, PhD
Jalonne White-Newsome, PhD
Robert Wright, MD, MPH

NIEHS Staff

Kathy Ahlmark
Janice Allen, PhD
Sara Amolegbe
David Balshaw, PhD
Martha Barnes
Sharon Beard
Brian Berridge, DVM, PhD
Abee Boyles, PhD
Danielle Carlin, PhD
Toccara Chamberlain
Jennifer Collins
Gwen Collman, PhD
Yuxia Cui, PhD
Christie Drew, PhD
Chris Duncan, PhD
Anika Dzierlenga
Amanda Garton
Nidhi Gera, PhD
Kimberly Gray, PhD
Jenny Greer
Janet Hall, MD, MS
Astrid Haugen
Michelle Heacock, PhD
Heather Henry, PhD
Jon Hollander, PhD
Mike Humble, PhD
Chandra Jackson, PhD
Bonnie Joubert, PhD
Helena Kennedy
Heather Knox
Richard Kwok, PhD
Alfonso Latoni, PhD
Cindy Lawler, PhD
Chris Long
John Maruca
J. Patrick Mastin, PhD
Kim McAllister
Liz McNair
Carolina Medina
Aubrey Miller, MD, MPH
Parris Milly
Nathan Mitchiner
Rosemary Moody
Sri Nadadur, PhD
Kristi Pettibone, PhD

Nicole Popovich
Alicia Ramsaran
Lingamanaidu Ravichandran, PhD
Scott Redman
Les Reinlib, PhD
Carol Shreffler, PhD
Thad Schug, PhD
Dan Shaughnessy, PhD
Natalie Shaw, MD
Varsha Shukla, PhD
Melissa Smarr, PhD
Spencer Smith
Bill Suk, PhD, MPH
Joselyne Tessa Tonleu
Laura Thomas, PhD
Claudia Thompson, PhD
Steven Tuyishime, PhD
Fred Tyson, PhD
Leroy Worth, PhD
Rick Woychik, PhD
Demia Wright, MPH
Darryl Zeldin, MD

Members of the Public Present

Ernie Hood, Bridport Services, LLC
Skand Shekhar, MD, NICHD
Hannah Valantine, MD, NIH

I. Call To Order and Opening Remarks

NIEHS and NTP Director Rick Woychik, Ph.D., welcomed attendees and called the meeting to order. He asked Council members in the Zoom call to introduce themselves. Acting Division of Extramural Research and Training (DERT) Director J. Patrick Mastin, Ph.D., went over some of the logistics for the meeting.

II. Consideration of June 2020 Meeting Minutes

Approval of the June 2020 meeting minutes was moved and seconded, and Council voted to approve the minutes, with all in favor.

III. People not Projects Update & Concept Clearance – RIVER & ONES

Dr. David Balshaw updated the Council on the two NIEHS programs focused on enhancing research by outstanding researchers: the Outstanding New Environmental Scientist (ONES) program and the Revolutionizing Innovative, Visionary Environmental health Research (RIVER) program, while seeking renewal of the concepts.

He provided information about the Common Fun High-Risk, High-Reward (HR/HR) Program, which supports exceptionally creative scientists pursuing highly innovative research with the potential for broad impact in the biomedical, behavioral, or social sciences within the NIH mission. The program provides four awards: Pioneer Award, Transformative Research Award, New Innovator Award, and the Early Independence Award.

The ONES R01:

- Identifies promising and highly motivated early stage investigators who intend to make a long-term commitment to environmental health research
- Provides a mechanism to jump start their career trajectory in pursuit of a novel EHS research program

The RIVER R35:

- Identifies NIEHS grantees that have demonstrated the potential for continued innovative research
- Provides a mechanism to support the majority of their established independent EHS research program

Dr. Carol Shreffler shared details about the ONES Award, including its purpose, its features, and the advantages it brings to NIEHS research. She went over the program's history and program statistics through May 2020.

Dr. Kavanagh was the first Council discussant. He said that the ONES program is found to be an exceptionally good program for NIEHS, as it is especially good at fostering the careers of outstanding investigators as they stay or move into EHS. He noted that it would be good to attract more applications from physician-scientists, especially those who may be doing epidemiological and/or clinical research. He felt that the statistics made it clear that it is a very successful program. He said that the training and mentoring aspects are particularly valuable. He recommended taking advantage of intramural/extramural collaboration opportunities.

Dr. Racette was the second Council discussant. He said the program has "an impressive success rate by almost every metric." He particularly liked the required 50% effort and the recognition that even early-stage R01 recipients need mentoring. He agreed that it is important to recruit physician-scientists early in their careers, before

clinical duties take over. He noted that there should be a balance in the portfolio between adults and children. He said there is a paucity of human research grants in the program. However, the program is “fantastic,” but there should be more diversification of the portfolio.

Dr. Sung was the third Council discussant. He said that many junior faculty members know little about how NIH works, so the mentoring element is quite important. He said that ONES has obviously been very successful. He shared concern about the lack of human studies, and felt that some of the money should be set aside for that purpose. He said the program is great and should be continued.

Dr. Mastin related a question from Dr. Hertz-Picciotto about the proportion of epidemiologists among the ONES awardees to the program’s applications. Dr. Shreffler replied that about 20% of the ONES awards were epidemiology grants, which has increased since the budget was increased. Dr. Cordero asked about the racial and ethnic diversity of the program. Dr. Shreffler said there are no data on the applicants when the applications are received. Any diversity information is stripped from applications before NIEHS receives them. Thus, there is no way to know the makeup of the applicant pool.

Jennifer Collins presented details about the RIVER program. It is designed to provide long-term support to an experienced investigator with an outstanding record of research productivity, and is intended to encourage investigators to embark on long-term projects of unusual potential. Ms. Collins described the features and eligibility requirements of the R35 award mechanism, as well as the history of the RIVER program. It is not necessarily career-stage specific, and encourages further exploration in all areas of science supported by NIEHS. It highlights freedom and flexibility, being aimed at supporting a person, not a program. It offers sustained support, as an 8-year award of up to $750,000 in direct costs per year. She provided details about the RIVER awardees to date, along with bibliometrics of the program’s successes. Moving forward, the RIVER program should:

- Continue RIVER, regularly assessing and adjusting program parameters
- Monitor progress of existing R35 grants with a focus on special features of the R35 mechanism
- Maintain inventory of other R35 programs
- Explore additional ways to bring together and connect current R35 awardees with ONES awardees

Dr. Kavanagh was the first Council reviewer. He said that RIVER is a very important program for the institute, and a very successful one based on the data available so far. He said the flexibility is key to its success. He wondered how many of the investigators

who have taken risks would admit to going down blind alleys or not having success, which is an inevitable outcome of high-risk programs. He said that increasing the role of epidemiology or human translation studies would be a good goal for the program, perhaps by encouraging researchers to take advantage of ancillary studies from clinical research trials or collaborations. He noted that it is a wonderful and very successful program.

Dr. Racette was the second Council reviewer. He said RIVER is a brilliant program and that he loved the concept and its flexibility. He said it is very important that the program creates an opportunity for mentorship. He felt that NIEHS needs to bring research closer to disease states. When research is clearly translatable to human health, people notice and it raises the stature of the institute, he observed. He recognized the people funded by RIVER as being outstanding, particularly those who are working in specific disease state, who are actually working in foundational environmental health research. He recommended carving out a portion of RIVER for human grants.

Dr. Sung was the third Council reviewer. He agreed that there is a responsibility to see that the more translational work is recognized, perhaps by earmarking some of the funds. He said it was a good idea to judge people's impact in terms of their track record. He noted that as RIVER is a new program, it would be important to document success. He said early indications are that RIVER will be successful, and it should be supported.

Dr. Mastin read a chat room question from Dr. Hertz-Picciotto: "Eligibility is the issue. Are epidemiologists more likely to use the multi-PI mechanism for their R01s? What is the obstacle to opening the R35 to those PIs with R01s using the multi-PI route? Ms. Collins said it was a question that came up frequently. She said many applicants only have multi-PI grants. There is very little overlap between the people who have single-PI and multi-PI grants, she noted. She said the program is about persons, not projects, so it has been a struggle. There is also the issue of what to do about consolidation. She said that is a cause for suspicion about why some of the epidemiology grants are not coming in, because they are not eligible. She said there are internal deliberations about what to do about the issue.

Dr. Goldman agreed with the reviewers' comments. She said the data about the program was encouraging, and may present an opportunity over time to expand the use of the RIVER mechanism. She said it addresses many of the concerns about the R01 process. She hoped that NIH would find ways to expand the concept and look at whether it could be used to also generate outstanding team science.

Dr. Mastin called for a motion to approve the ONES concept. There was a motion and a second, and the Council voted. He then called for a motion to approve the RIVER concept. There was a motion and a second, and the Council voted.

IV. Report of the Director, NIEHS

In his first Council meeting as permanent Director of NIEHS and NTP, Dr. Woychik briefed Council on Institute developments since the June 2020 Council meeting.

Concluding his opening remarks, Dr. Woychik said, “We have a lot of work ahead of us, and in the end I will do my best to bring the type of leadership to the Institute and to the environmental health sciences community that will help to coalesce our efforts together in powerful ways to address the challenges that we face in the future.”

He updated attendees on COVID-19 staff planning at NIH. NIH has been encouraging enhanced telework since March. There is a working group at NIEHS providing guidance to senior leadership committee as to when it will be safe to bring staff back to campus, and how to implement physical distancing and other safety measures. In June, a plan was formulated at NIH involving four groups of staff, Groups A – D. Groups A and B are mainly staff who cannot conduct their work via enhanced telework. Group A returned to campus in July; Group B returned in August. There is currently no plan to bring Groups C and D back to campus. Their enhanced telework will likely continue at least through the end of the calendar year. So far, there are no documented cases of SARS-Cov2 transmission on campus.

Dr. Woychik provided a summary of budget and appropriations affecting NIEHS. FY2020 allocations were received earlier this year. The final allocation increased the budget by 3.6% to just over $802 million. The Superfund Research Program received a 2.6% increase to $81 million. With the $10 million training allocation, the total budget is just short of $900 million. He went over NIH funding received in the Recovery Package Phases 1, 3, and 3.5. NIEHS got $10 million in Phase 1 to support the Worker Training Program. The tentative NIEHS budget for FY2021 totals $954 million, a 7% increase. It is likely there will be a continuing resolution starting October 1. He described a tentative Phase 4 pandemic response in Congress.

He framed the rest of his presentation around the three strategic themes embodied in the NIEHS Strategic Plan. He recounted the three themes incorporated in the NIEHS Strategic Plan: Advancing Environmental Health Sciences, Promoting Translation – Data to Knowledge to Action, and Enhancing Scientific Stewardship and Support.

Under Theme One, he provided vignettes of some the research publications since the last Council meeting, including activities from DIR, DNTP, and DERT researchers. He described recent works from Dr. Carmen Williams, Dr. Nicole Kleinsteuer, and Dr. He.

Under Theme Two, he provided more details about measures being taken to keep NIEHS staff safe from COVID-19, including mandatory adherence to public health practices and 7 weeks of on-site voluntary testing, which was completed September 4.

He described a variety of intramural targeted anti-COVID-19 program awards, promoting several projects devoted to the study of the biology of COVID-19. In addition, several new initiatives are available under DR2, including Dr. Doug Bell's screening project under the RADx-rad initiative.

Under Theme Three, he went over recent new hires and a variety of awards and recognitions earned by NIEHS personnel and grantees.

Dr. Woychik provided opening remarks on racism, diversity, equity, and inclusion (DEI) at NIH and NIEHS, which took up the balance of the Council meeting. He recounted the various developments and events since the early June police killing of George Floyd in Minneapolis. There is currently an effort to develop a framework that can be used across NIH to address DEI. He noted that the NIEHS Senior Leadership Committee is focused on creating tangible and sustainable change in four priority DEI areas:

- Training and education
- Science of racism and environmental health disparities
- Workplace diversity
- Culture and inclusion

A fifth cross-divisional group is being formed to address environmental health disparities. The Office of Science Education and Diversity is undertaking several initiatives. NIEHS is establishing a Kenneth J. Olden Annual Distinguished Lecture series to recognize and celebrate outstanding scientists from underrepresented groups. The kick-off lecture by Dr. Olden himself is to be held September 21. NIEHS is also establishing a DEI information and resources website.

As Dr. Woychik concluded, "There is so much more that we need to do…"

- Align with the directives coming from the OD in Bethesda
- Work to evaluate why African American/Black and other URMs are not getting their grants funded
- Enhance mentoring programs, both at NIEHS and in our grantee organizations
- Increase diversity in hiring strategies
- Better understand and address the fundamental elements that underlie DEI at NIEHS
- Engage all members of Council and others in the extramural communities to capture their input and wisdom

Dr. Cordero said that the work going on throughout NIH on institutional racism is highly commendable. He asked Dr. Woychik to discuss the process of identifying where institutional racism occurs and how that might impact the funding and professional development of investigators from minority groups. Dr. Woychik said that Dr. Collins and

Dr. Tabak have explored the issue in great depth. He said there is clearly a conscious and unconscious bias in funding of African American/Black and other underrepresented minority grants. He said the IC directors recognize that it will be necessary to change the culture in the biomedical research enterprise. It must go beyond simply increasing diversity. He encouraged accessing the 8cre website and its 8 specific recommendations. Dr. Cordero said it would be important to identify the barriers to underrepresented groups getting funded. Dr. Woychik said that later in the meeting there would be considerable data presented on the topic. “I wish this were a simple problem, but it’s not,” he said. “It’s a multi-faceted problem, and we want to make progress.”

Dr. White-Newsom asked Dr. Woychik how he foresees the Council being integrated into the activities of the institution, with one or two examples. She also asked if there are immediate actions that could be taken in terms of COVID response and the climate-related crisis that could be done now to better address some of the results of structural racism. Dr. Woychik said that Council is viewed as a critically important advisory group, with members chosen based on their wisdom, their experience, and their thoughtfulness. Replying to Dr. White-Newsom’s second question, Dr. Woychik said that the cross-divisional planning group will be very important, being charged with coming up with specific recommendations on environmental justice, racism and other areas related to EHS. He noted also the Ken Olden lecture series, to bring more awareness of underserved, minority environmental health scientists. Dr. Collman cited examples of how Council has participated in NIEHS activities, such as the Partnerships for Environmental Public Health, which was developed 10 years ago with the active involvement of Council. Also, all Council members were involved in the formulation of the NIEHS Strategic Plan.

Dr. Korfmacher talked about how anti-racism training in some ICs has had to be cancelled in the wake of the White House memo saying that federal agencies are not allowed to conduct such training. She asked how that has affected NIEHS activities, and how Council members can help. Dr. Woychik said that when the executive order came out, leadership at NIH was contacted for advice, and the response was that, right now, the issue is at the Office of General Counsel for evaluation. He noted that NIEHS is part of the executive branch, and his boss, ultimately, is the President. He said that any action should wait until there is legal advice to better understand the meaning of the executive order.

V. Social and Environmental Determinants as well as Health Consequences of Sleep Disparities

Dr. Zeldin introduced Dr. Chandra Jackson, a Stadtman Investigator in the Epidemiology Branch.

She characterized sleep as an essential need for maintaining biological homeostasis; a seemingly simple behavior and yet complex physiological state that is not entirely endogenous and is, therefore, positively or negatively affected by modifiable physical (e.g., light, temperature, noise) as well as social (e.g., psychosocial stress) environmental factors. Preventing or minimizing the impact of environmental disturbances on sleep duration, quality, and timing could help mitigate the potential detrimental health impacts of adverse environmental disturbances, which are differentially experienced by race/ethnicity and socioeconomic status. Some health outcomes (e.g., obesity, hypertension, diabetes) most notably associated with cardiovascular disease are also affected by suboptimal sleep, and recalcitrant racial/ethnic and socioeconomic disparities in the relationship between sleep and various cardiometabolic conditions exist. Using the socioecological framework coupled with the biopsychosocial model, the presentation described pathways by which features of the physical and social environments may influence sleep health disparities and subsequent health outcomes across the life course.

Dr. Jackson concluded:

- Sleep is essential for human health across the life course.
- Suboptimal sleep can lead to poor mental and physical health outcomes.
- Sleep should be considered just as important as nutrition and physical activity.
- Early life exposures appear to independently contribute to sleep in adulthood.
- Racial disparities and suboptimal early life exposures and sleep health exist.
- These factors have implications for the severity of disease often seen at earlier ages across the variety of outcomes.
- Earlier life exposures including poor sleep may contribute to widespread, recalcitrant health disparities.
- Racial/ethnic differences and the interconnected, modifiable physical as well as social environments will likely serve as effective interventions to mitigate health disparities, but addressing structural racism will likely help eliminate health disparities.

Dr. Cordero complimented Dr. Jackson on her approach to the intersection between health and social determinants. He said her use of sleep as an element of that intersection is a good model that could be used for other elements.

Dr. Penning indicated his interest in research related to co-exposures that might lead to sleep deprivation. He cited previous work from his center showing that children with relatively low levels of lead exposure suffered sleep disorders.

Dr. Vasquez asked if people were looking at genetic variants in sleep. She asked if there were genetic components that allow some people to function perfectly well on just

4 hours of sleep. Dr. Jackson replied that there is a fair number of researchers investigating the genetics of sleep, and it is getting more attention than the social and environmental determinants. She said that it is estimated that genes contribute about 30% to sleep duration.

Dr. Hertz-Picciotto said she was struck by Dr. Jackson's reference to sleep deprivation as a method of controlling slaves. She wondered about the sort of epigenetic or intergenerational impacts that type of treatment may have had. She also asked about circadian rhythms over the life span. Dr. Jackson said she was not aware of any studies looking at intergenerational effects of sleep deprivation. She noted that there are studies looking at intergenerational effects of post-traumatic stress disorder. There is data concerning soldiers with PTSD and its effects on sleep. She noted that circadian rhythms are known to change at various stages of development over the life course.

VI. Bias and Systematic Racism in Academic Health Care: NIH Strategies for Change

Dr. Hannah Valantine, the NIH Chief Officer for Scientific Workforce Diversity, briefed the Council on issues surrounding bias and systematic racism in the scientific enterprise.

She addressed why diversity matters:

- Excellence, creativity, innovation
- Broadening scope of inquiry: Health disparities
- Changing demographics: Types of diversity
- Global research preeminence

"If NIH is really to ensure that it is pulling from its entire intellectual capital, we must be inclusive in our work to bring in more people with diverse perspectives," she noted.

She focused on presenting data to Council documenting institutional bias and systemic racism.

She described the diminishing representation for women and underrepresented groups in scientific career progression, falling to miniscule levels among full professors and department chairs. NIEHS has a representation higher than the national average of tenure-track women, tenured women, and female lab or branch chiefs. Dr. Valantine showed data on NIEHS principal investigator demographics, by sex and by race/ethnicity.

She described the racial gap in research grants (R01-eq) and career development awards (K).

Citing Hoppe et al 2019, she discussed how “Our analysis shows that all three of the factors that underlie the funding gap – preference for some topics over others, assignment of poorer scores, and decision to discuss an application – revolve around decisions made by reviewers.”

A new analysis shows that ICs have widely varying award rates, with R01 success rates lower for African American/Black applicants than for white applicants. She suggested several potential intervention targets to close the racial gap in R01 funding. She noted that implicit bias and racism perpetuate the lack of an inclusive climate, resulting in:

- Feeling of isolation, lack of a sense of belonging
- “Minority tax” – mentoring, serving on minority committees
- Sexual or racial harassment
- Worries of fulfilling stereotypic expectations
- Hypervigilance of errors and failures, as minorities are in the “spotlight” and are being scrutinized more

She described the impact of bias on decisions in scientific settings, such as:

- Scientific workforce diversity
- Hiring, promotion, grants, tenure
- Peer review and grant proposal success
- Grading of faculty by students and trainees
- Respect, salaries, institutional culture
- Patient care and research subjects

She discussed how bias is pervasive in science and beyond, is rooted in stereotypes, and begins early. She provided examples from the “Draw a Scientist” test.

She went into the impact of implicit bias in health care, which leads to health disparities. She described the science behind implicit bias, and steps that can be taken to reduce cognitive biases, particularly in the academic setting, including the hiring process.

She related several ideas to mitigate the impact of social injustice on scientific workforce diversity, which emerged at a recent working group discussion:

- Openly acknowledge the problem of anti-black racism in science
- Promote community-based research focused on external validity
- Support our black peers during this time of emotional turmoil and feelings of hopelessness

- Adjust the factors that admissions and other selection committees value
- Monitor and report acts of racial bias; hold perpetrators accountable
- Empower allies to be actively anti-racist

She discussed immediate actions to be taken by NIH to address structural racism:

- Trans-NIH action plan: four IC directors' meetings
- Address residual racial gaps in NIH research awards (R01)
- Learning resources on active listening, anti-racism, and bias interruption
- Enacting mandatory implicit bias training for NIH staff
- Monitoring and reporting faculty diversity metrics
- Establishing new awards to address health disparities

Dr. Valantine concluded her presentation by relating the motto of her NIH office: "Great minds think differently."

Dr. White-Newsom asked Dr. Valantine to elaborate on the Draw a Scientist study she had alluded to. She said that further results showed that Black people are less likely to be thought of as a scientist, even more so than the results for women.

Dr. Wright asked about the Hoppe paper on the topics being studied by minority scientists being considered less important by NIH reviewers. He asked what those topics are, and whether they might actually be the most important topics, with potential actions as a result. Dr. Valantine said that among the topics were health disparities, minority health, women's health, and more. There is a call for action for each institute to look at their portfolios and broaden them to ensure that those topics are covered, along with diversity of grantees.

Dr. Goldman talked about the importance of involving young people early to give them the concept of working in science. She discussed the relation of environmental justice and risk assessment. "If racism were a toxin, we would consider that toxic agent to be more potent than almost anything else we work on," she said, noting that it is a huge area of opportunity for research. Dr. Valantine agreed that racism is a toxin, and there is a sense that NIH ICs are working to determine what kind of science to study in that regard. She said there will be exciting new research in that space coming up.

Dr. Perez-Lugo asked Dr. Valantine about diversity in career grants, in that information about the applicants is stripped – obviously that is intended to reduce bias, but apparently that is not working. Dr. Valantine said it is a difficult question, because it gets to the core of the legal requirements. Race and ethnicity information is kept separately, and legal counsel reminds constantly that it cannot be taken into consideration. She said she has a sense that nonetheless race is being taken into consideration. She said she did not know how to answer the question or give help. Dr. Mastin noted that it is an

issue that NIH has dealt with and finds challenging. Dr. Woychik said that IC directors are concerned and very interested in finding ways to address the issue. Dr. Valantine said that “if you really want to know, there are ways.”

Dr. Ho asked if Dr. Valantine had data on other racial groups, and about the NIH criteria of “racial minorities” and “underrepresented minorities.” Dr. Valantine said that there are data on gaps for Asian-American scientists. The gaps are also present for Asian-American applicants. As the career path progresses to senior leadership, Asian-Americans are “severely underrepresented.” She said that NIH recognizes the issue and is working on it across the country.

Dr. Cordero said there are elements that give away the source of an application even when identifying information is stripped. He said true blinding is difficult. Dr. Valantine agreed, and said that the director for the Center for Scientific Review is very interested in the topic and in designing pilot studies. She described one study that had been done, which showed that even when the identifying information was stripped, a large proportion of subjects could correctly guess the race of the applicant.

Dr. Shih asked about the intersection of a variety of factors leading to institutional bias and racism, such as, race, gender and disability. Dr. Valantine said that although her group had not addressed disability directly, but that last year a member of the Advisory Committee to the Working Group on Diversity took the issue on and made a compelling presentation to the working group that indicated a lack of data, and the distinct likelihood that the disabled were vastly underrepresented. There is a subcommittee studying the issue and will make recommendations on how to move forward with addressing disabilities. She said the intersectionality is very important, and would be the next frontier for study.

Dr. Woychik asked if Dr. Valantine had any words of wisdom for Council on how council members could more actively be working with leadership to address these issues. Dr. Valantine said that “a small group working on these issues is very important, and focusing on a particular issue.” She recommended a subcommittee of the Council dedicated to working on the issues, perhaps meeting monthly.

VII. Report of the Acting Director, Division of Extramural Research and Training (DERT)

Dr. Mastin briefed the Council on DERT developments since its last meeting, and along with DERT personnel, detailed activities related to racism, diversity, equity, and inclusion in EHS research.

He reported recent DERT hiring. He updated DERT COVID-19 funding opportunities, providing details about the NIEHS Notice of Special Interest (NOSI), which is intended to promote rapid understanding of potential contributions of exposure to environmental agents that may exacerbate COVID-19 susceptibility, disease severity, and progression. The awards are Administrative Supplements and Competitive Revisions, and Time-sensitive R21s. $2.75 million has been set aside.

Dr. Mastin described the NIH/NIEHS Worker Training Program (WTP) COVID-19 Virtual Safety Training Initiative. WTP received $10 million from the Coronavirus Preparedness and Response Supplemental Appropriations Act, 2020. The goal of the program is to increase health and safety awareness for responders and workers who face potential exposure to COVID-19.

He provided an update on DERT activities, including a report on a new funding opportunity, New Cohorts to Assess Environmental Exposures and Cancer Risk (NCI-led new UG3/UH3 RFA). The program will fund approximately five new prospective cohorts. He detailed the UG3/UH3 mechanism, and discussed the RFA's overall budget.

Dr. Mastin reported on recent and upcoming DERT meetings.

He went over the afternoon's agenda, to include presentations from DERT staff on issues related to racism, diversity, equity, and inclusion in EHS research, designed to lay the groundwork for the planned two-hour Council discussion on those topics.

He presented the questions prepared for Council discussion:

- Increasing Diversity
    - What kinds of outreach efforts are needed to increase interest in our training programs among underrepresented groups?
    - What types of efforts are needed to retain the underrepresented students and trainees for all of our programs?
    - How can we increase the success rate for F31s?
    - Where is the best place to put our limited training resources?
    - What changes are needed to our various training programs?
    - How should we develop outreach programs for Minority-Serving Institutions?
- Funding Equity
    - How do we best address the funding gap?
    - Are there inherent biases in our grants process?
- General
    - What other data are needed to address these issues?

Dr. Mastin noted that although the discussion would not address the important issue of research related to health disparities and environmental justice, those topics are considered highly important, and will be discussed in depth at a later Council meeting. NIEHS has had a long and illustrious history supporting research in those areas.

He showed a graph illustrating the funding gap in biomedical sciences, with doctorates among African Americans totaling just 6%; for doctorates related to biological and biomedical sciences, the total was just 3%. He presented materials describing the value of enhancing diversity in the EHS biomedical workforce, particularly the overarching themes of recruitment and retention.

Dr. Michael Humble addressed training and related programs focused on enhancing the diversity of the EHS workforce. He depicted a number of the NIEHS training and career support programs, highlighting several that incorporate diversity components. He noted that annually NIEHS trains approximately 600 individuals, with about 23% participating in programs focused on increasing diversity.

Dr. Steven Tuyishime discussed the F31 diversity grants in more detail. NIEHS funds several types of fellowships whose purpose is to support full-time research for pre- or postdoctoral candidates. He focused on the F31 Individual Predoctoral Fellowships to Promote Diversity in Health-Related Research. Since 2001, NIEHS has funded 41 F31 fellowships out of 145 applications. Since 2005, the program has funded 29 individuals who have branched out into various scientific careers, all of who have stayed in science.

Dr. Humble provided information about institutional training programs: T32s, the R25 summer program for high school students, undergraduates, and teachers, the R25, the Undergraduate Research Education Program (UP).

He pointed out that some of the R25 programs are partnering with minority-serving institutions and HBCUs for student recruitment. Those institutions play an important role in the pipeline attracting students into the biomedical research field. One example is the NIGMS Support for Competitive Research (SCORE) program, which NIEHS participates in.

Dr. Fred Tyson discussed the ARCH program: Advanced Cooperation in Environmental Health, which made six awards between 1999 and 2006. The goal was to enhance research capacity at minority-serving institutions via collaboration with research-intensive universities. It yielded 167 peer-reviewed manuscripts. “A key lesson learned that we can take home from our support of the ARCH program was that the level of institutional commitment was really instrumental in having successful outcomes for the program,” Dr. Tyson said.

Dr. Tyson also provided information about the NIH Diversity & Supplement Program, funded by PAR 18-586 and PAR 18-592, which is used to improve diversity in the workplaces that NIH supports through research grants. NIEHS has supported 105 Diversity & Re-entry supplements since 2011. He illustrated where the diversity supplement candidates have been geographically and in terms of career stage. He reported on a 2016 analysis that indicated that the program "seems to be doing its job."

Sharon Beard reported on Worker Training Program (WTP) efforts contributing to diversity. She provided background and historical information about WTP efforts. For the WTP diversity inclusion effort, the environmental career leads with over 80% of the trainees representing diverse ethnicities and backgrounds. The goal has been to increase the number of underrepresented and unemployed workers in the environmental and construction fields. She presented data about the economic impact of the program.

Dr. Mastin presented proposals for NIEHS training programs moving forward:

- More proactive outreach efforts
- Join other NIH initiatives – MOSAIC and others
- Work across NIH to strengthen diversity requirements for the NRSA programs
- Diversity R15 program
- Develop network of Diversity Supplement, F31, R25, etc. trainees

Returning to the issue of the funding gap, Dr. Mastin showed additional information illustrating disparities in NIH and NIEHS applications and awardees from 2010-2019. The rates for African Americans were quite low, speaking to the need for interventions to increase diversity.

Dr. Vasquez asked about the effects of bias on people who achieve success. Dr. Woychik said that question came up repeatedly in the listening session leadership had with NIEHS staff. He agreed that at times the treatment of women and underrepresented minorities is unfair.

VIII. Council Discussion

Dr. Mastin introduced Dr. Christie Drew, who would moderate the Council discussion session. Dr. Drew introduced the session by invoking the concepts of kindness and assuming noble intent.

Dr. Cordero was the first Council discussant. He commended NIH and NIEHS leadership for their work addressing diversity and social justice. He said that a concern is that there is a lot more to learn. He related three episodes of bias or systematic racism from his own career. He said it is heartwarming to see diversity, especially in the

Council, although he would like to see more black Council members. He said it would be important to understand the barriers and enhancers that make it possible for different minority groups to succeed. He said he applauds the “deep dive” that NIEHS is doing to understand the steps that need to be taken to promote greater diversity in environmental health research.

Dr. Ho was the second Council discussant. She spoke about her background as an immigrant scientist. She said that her career travels have made her realize that diversity and inclusion are different than what is perceived. She discussed the maps that had been shown depicting where the T32 and R25 programs are located; in the “exact opposite states.” She said there is a mismatch opportunity in that partnerships between states with great resources and the need to train and nurture minority or disadvantaged populations of scientists. She suggested partnerships with HBCUs. She said it would be important to “increase the pool” at a very early age, by re-programming the brain. By six years old, it is too late, she noted. She added that scientific topics should be changed, to better recognize child health and maternal health, because those groups have not had a voice. NIH and NIEHS need to serve as their voice, she said. She discussed the role of immigrant scientists and the criteria of training programs.

Dr. Goldman was the third Council discussant. She discussed her experience in training. She noted that when she went into environmental health, there were very few women in the field. She said that as a dean, she could see that there are not enough opportunities to support minorities and women in training. There need to be more resources, because she could not see the pipeline of young faculty coming forth at the needed rate. She said she was particularly concerned right now about the disproportionate impact on poor people and women by COVID. There is an implicit bias in the assumption that the female will be responsible for home schooling of children.

Dr. Wright praised the listening sessions described by Dr. Woychik. However, he said, in efforts to understand root causes, “whatever we’re doing right now, I think most people agree, it’s not working very well.” He suggested expanding listening sessions to people who have not been successful getting funding, or have experienced barriers in their careers.

Dr. Perez-Lugo discussed the issue of institutional commitment. She said that the thinking is in individual terms, by pointing to individuals who do not apply for grants or do not follow the established process. The structural barriers should be examined. She asked Dr. Tyson to elaborate on how he would see investing resources in addressing the institutional climate instead of addressing particular potential candidates. She also talked about some of the measures of success for minority students as being able to leave their communities, which is difficult because some of the students are deeply committed to their communities.

Dr. Tyson defined institutional commitment, citing several examples. He said that outreach programs at some institutions are “way more successful” than others, and that the cultural mindset needs to change to improve institutional commitment. He noted that name recognition and institutional recognition play a role in the review process. Responding to Dr. Ho’s comment, he cited the example of a K-12 program that did reach out to young children.

Dr. Cordero said that the issue of people wanting to stay in their communities is very real, citing a specific example in his experience.

Dr. Shih discussed racism as a topic for research. He wondered if there is an opportunity to think about expanding the topics that NIEHS supports. He said he understands the risk involved in doing so, but it should be attempted. He said it would create a more hospitable funding environment and perhaps attract more talents. He also addressed funding priorities from people’s perspective, citing Autism Speaks experiences. He said it had been mainly focused on basic sciences, but recently started to appreciate the importance of social determinants. He felt that the racial makeup of an organization has consequences in terms of what is prioritized. He discussed the fact that the pandemic has widened disparities, with minorities affected disproportionately. He said that his organization was caught flat-footed in terms of how to respond.

Dr. Hertz-Picciotto said that “the numbers are shocking.” She cited the historical record of racism and wondered how it could be that such small steps have been taken compared to the magnitude of the problem. However, she said she had been energized by the movement in response. She described the situation and recent events at her institution. She discussed using the mentoring models from the ONES awards and applying it to all of the training mechanisms. She said she had been struck by how few F31 awards there were and wondered why the proportion of applications that were awarded appeared to be shrinking over time. She noted that climate and health impact people of color and low-income areas disproportionately. She felt that the younger generation is much more involved with the issue than the older generation, and that that presents an opportunity for increasing the pipeline. Dr. Drew replied that the scores are not very good in the F31 program.

Dr. White-Newsome said she had experienced racism, sexism and patriarchy in her career in chemical engineering. She discussed the importance of individual work and the work of the Council. She said she hoped this would not be the last time that these issues would be discussed, and that every meeting should include reference to diversity, equity, and inclusion. She hoped that the Council itself would reflect the makeup of society. She wondered if there has been a quantitative analysis of funded versus non-funded proposals, to see if there was any inherent bias. She also wanted to look at the process itself, in terms of barriers and criteria that may be burdensome. She

felt that the targeted pipeline was very important, as well as retention. She wondered if there would be a way to create a funding program or mechanism that actually targets geographies where there is a particular need, and where there may be few scientists of color. “Is there some type of research opportunity that can target underrepresented researchers and scientists in areas where there are multiple disparities?” she asked.

Dr. Drew agreed that geographically there are large gaps in terms of areas where funding goes. Also, the rate of applications from HBCUs has historically been low, she said.

Dr. Penning shared his own story of life experiences, as an immigrant scientist. He felt that many of the numbers shared during the meeting on NIEHS programs “are not fantastic.” He said there is a systemic issue, and the pipeline should be primed “early on.” Thus, he said he supports the idea of having early intervention and education programs. However, he asked who would be doing the K-12 education. He cautioned that “the last thing we need to be doing is sending these children to individuals who don’t look like them.” He noted that there must be partnerships between NIEHS and other institutions. He endorsed the ARCH program as an example. He discussed the history of inclusion and diversity. Years ago, the definition of an underrepresented minority was limited, but then it was expanded to include groups such as the disabled and economically disadvantaged. More recently, it was further expanded to include individuals from single-parent homes, people on welfare and food stamps, etc. He asked about the numbers from those expanded group: “Is the problem much bigger than we realize?” A recent editorial suggested that adding those categories actually may have diluted the problem. But the issue is where to address resources.

Dr. Tanguay noted that you cannot assume that the individual in front of you is representative of a particular group. She said it would be necessary to listen closely and individualize support. She suggested funding T32s tethered to particular institutions.

Dr. Parker said she felt that Dr. Wright’s idea about linking T32 grants to minority-serving institutions was a good one. She said there were aspects of the review process that should be looked at. First, there was the leadership training for the chairs of review committees. She agreed that it would be important to look at biases in topics. She endorsed the idea of establishing a subgroup of the Council.

Dr. Korfmacher said that supporting research that relates to people’s lived experiences and their motivations to become scientists is essential to meeting the goals of increasing diversity and addressing the funding gap. She cited the research involved with the Environmental Justice Research Program, which was from 1994-2007, and said it should be revisited. She said there should be added focus in training programs on how and what is being trained.

Dr. Ellison spoke about George Floyd and COVID-19 bringing attention to systemic racism in the U.S. He said that as a black man, he had seen it and it had been a constant part of his existence. He cited the 400 years that Black people have been oppressed in the nation. He agreed with prior comments about how to increase the pipeline of young people interested in environmental health, particularly the need to start early to introduce science. He said there is a need to reach students in disadvantaged neighborhoods. He called for improved metrics to evaluate diversity efforts in a more meaningful way.

Dr. Kavanagh described his own perspective and upbringing. He noted, “From the earliest stages of our development, we are inundated with prejudicial thoughts and potential to intervene. “So, I am grateful that people have thought about that as a really important stage in people’s development.” He said he was curious about some of the programs that Dr. Balshaw had discussed, such as the IDEA state program. He noted that there were many minority-serving institutions in his area, and asked how to increase partnering with them. Dr. Mastin said that Washington, where Dr. Kavanagh is from, is not an IDEA state, but that the AREA R15 program is not restricted to states.

Dr. Sung said that being a person of color, it was difficult for him to talk about racism. He said he had found Dr. Valantine’s presentation to be quite compelling. He was glad to be at an institution (University of Texas Health Science Center at San Antonio) with many minority students, allowing him many opportunities to mentor students. He said that the main problem with the pipeline is that there are not enough mentors who are successful. He said there are not enough Hispanic or Black mentors, due to past systemic racism and lack of opportunities. He said the most successful NIH investigators should be encouraged to mentor people of color. He observed, “Institutions are not doing enough, including my own … to convince the really successful people to act as mentors and role models for people of color, people of underprivileged backgrounds, and so on.” He said that NIH and NIEHS need to come up with creative ways to use a carrot and a stick to encourage people to commit themselves to giving something back.

Dr. Racette related his experiences in having a K24 mentoring grant for ten years. He said he had had the privilege of mentoring over 30 women and underrepresented minorities. He said many of them were now mentoring women and underrepresented minorities themselves. Thus, the talent pool is starting to expand. He noted that “diversity begets diversity.” He said that in medical training, women and underrepresented minorities tend to be attracted to the more popular specialties like surgery and dermatology, making it more difficult to recruit them to EHS.

Dr. Mastin asked Dr. Wright to elaborate on his chat comment on cross-racial mentoring. Dr. Wright said that because of the “diversity tax,” the successful people who

are underrepresented minorities cannot mentor everyone. Thus, there will be white mentors for minority trainees, and it would be good to research the impact of that phenomenon. Dr. Drew talked about cross-cultural mentoring and said she would welcome any resources on the topic.

Dr. Ho said that young trainees probably prefer to see someone who looks like them or has a similar background, which would mean more “minority tax” on those people. She said she had learned to turn down some of the mentoring requests she received. She said that energies should be focused on any program that would “advance us forward,” so that the issues would not need to be revisited. She hoped that actions emerging from this meeting would have long-lasting effects.

Dr. Cordero agreed that it would be necessary to learn more about the key factors affecting mentorship. He noted that his best mentors were two whites, with whom he had established a lifelong friendship.

Dr. Geller said there need to be topics of explicit interest to attract grant applications and trainees, particularly surrounding race and racism and their interaction with human biology, disease, and biomarkers. He added that there needs to be a different mix of scientists, to include other disciplines such as sociology and anthropology.

Dr. Mastin asked for comment on where to look for biases in process that may be difficult to see. Dr. Wright said it is assumed that the way significance and innovation are defined is correct, and people are trained to use those criteria when they prepare a grant. Since NIH is so influential, institutions are built around making sure those criteria are followed. Since those criteria value genetics more than health disparities, institutions are going to build their infrastructure around genetics, he noted. So, people interested in health disparities are at a disadvantage.

Dr. Woychik commented that many of the problems being discussed are multidisciplinary in nature. He said that “we keep siloing ourselves, and we have to get away from that.” The problems are complicated and should be being addressed in a truly multidisciplinary way. Dr. Wright agreed, but said it sometimes had not been his experience. Dr. Woychik responded that “we have to continue to preach our message.” He added that there needs to be more crosstalk among the disciplines. Dr. Wright said that it is difficult for researchers interested in health disparities to bring genetics into the mix. Dr. Woychik reiterated that it is necessary for researchers to get out of their siloes and be open to team science, collaborative science, and multidisciplinary approaches.

Dr. Parker observed that the current environment is “hardening of the categories.” She said that more emphasis needs to be placed on prevention.

Dr. Shih asked about the link between NIEHS and NIMHD. Dr. Mastin mentioned a program the two institutes are jointly funding. Dr. Collman said there is a long-time partnership between NIEHS and NIMHD, describing the history of the relationship and current developments.

Dr. Hertz-Picciotto said she hoped that Dr. Woychik's idea of helping other institutes incorporate the environment would succeed, but that some institutes would be easier than others. She recounted her experience with NIMH as an example of resistance to the idea of environment playing an equal role with genetics in disorders such as autism.

Dr. Penning said that there should be a charge by the leadership of NIEHS if there is a subcommittee of Council formed.

Dr. Woychik said the idea is to build on the model of the diversity working group of the ACD. He said it would be a working group to meet between major Council meetings and work out details and recommendations for the NIEHS leadership. Dr. Collman said that the desire is to keep the conversation going, and that the details of the working group can be worked out later. It would not develop funding announcements, but would help NIEHS leadership understand more deeply the issues raised in today's discussion. Dr. Mastin raised some of the practical issues associated with a Council working group.

Dr. Woychik asked the Council members to register their approval of the concept with thumbs up. Several members did so.

Dr. Wright said, "This has been the best conversation at Council ever!"

Dr. Woychik added, "We're going to study this, we're going to figure out what we can do that will have meaningful impact in the long term, and we're going to continue talking about it."

IX. Adjournment

Dr. Mastin thanked everyone involved with the meeting, and adjourned the session. Dr. Woychik thanked Dr. Mastin and his team for their efforts, along with the members of Council. He adjourned the meeting at 2:45 pm, September 16, 2020.

CERTIFICATION:

/s/	/s/
Rick Woychik, PhD Chairperson National Advisory Environmental Health Sciences Council	J. Patrick Mastin, PhD Executive Secretary National Advisory Environmental Health Sciences Council

Attachment:
Council Roster