U.S. Department of Health and Human Services
National Institutes of Health (NIH)
Office of the Director (OD)
Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI)

Council of Councils Meeting
September 6, 2019

Meeting Minutes

I. CALL TO ORDER AND INTRODUCTIONS

James M. Anderson, M.D., Ph.D., Director, DPCPSI, welcomed participants, NIH staff members, and members of the public to the meeting of the Council of Councils. The meeting began at 8:00 a.m. on Friday, September 6, 2019, in Building 45/Natcher, Room E1/E2 on the NIH Campus in Bethesda, Maryland. Dr. Anderson noted that Dr. Charles Mouton was unable to attend, and that Drs. Patricia Hurn and Paul Johnson were attending by phone. He also announced that Dr. Bruce Ovbiagele was no longer eligible to serve as a Council member because of his federal employment at the Veterans Administration; a replacement likely will be appointed within a year. The meeting attendees are identified below.

Following introductions and announcements from Franziska B. Grieder, D.V.M., Ph.D., the executive secretary for the NIH Council of Councils, Dr. Anderson reviewed the day's agenda.

A. Attendance

1. Council Members

Council Members Present
Chair: James M. Anderson, M.D., Ph.D., Director, DPCPSI
Executive Secretary: Franziska B. Grieder, D.V.M., Ph.D., Director, Office of Research Infrastructure Programs (ORIP), DPCPSI
Maria Rosario G. Araneta, Ph.D., M.P.H., University of California, San Diego, La Jolla, CA
Kristin Ardlie, Ph.D., Broad Institute of MIT and Harvard, Cambridge, MA
Jeffrey R. Botkin, M.D., M.P.H., The University of Utah, Salt Lake City, UT
Linda Chang, M.D., FAAN, FANA, University of Maryland School of Medicine, Baltimore, MD
Graham A. Colditz, M.D., Dr.P.H., M.P.H., Washington University School of Medicine, St. Louis, MO
Andrew P. Feinberg, M.D., M.P.H., Johns Hopkins University, Baltimore, MD
Rick Horwitz, Ph.D., Allen Institute for Cell Science, Seattle, WA
Patricia D. Hurn, Ph.D., R.N., University of Michigan, Ann Arbor, MI
Kevin B. Johnson, M.D., M.S., Vanderbilt University Medical Center, Nashville, TN
R. Paul Johnson, M.D., Emory University School of Medicine, Atlanta, GA
Paul J. Kenny, Ph.D., Icahn School of Medicine at Mount Sinai, New York, NY
Sachin Kheterpal, M.D., M.B.A., University of Michigan Medical School, Ann Arbor, MI
Gary A. Koretzky, M.D., Ph.D., Weill Cornell Medical College, New York, NY
Michael D. Lairmore, D.V.M., Ph.D., University of California, Davis, Davis, CA
Jian-Dong Li, M.D., Ph.D., Georgia State University, Atlanta, GA
Terry Magnuson, Ph.D., The University of North Carolina at Chapel Hill School of Medicine, Chapel Hill, NC

Edith P. Mitchell, M.D., FACP, Thomas Jefferson University, Philadelphia, PA
Megan O'Boyle, Phelan-McDermid Syndrome Data Network, Arlington, VA
Rhonda Robinson-Beale, M.D., Blue Cross of Idaho, Meridian, ID
Susan Sanchez, Ph.D., The University of Georgia, Athens, GA
Jean E. Schaffer, M.D., Joslin Diabetes Center, Boston, MA
Scout, Ph.D., National LGBT Cancer Network, Pawtucket, RI
Anna Maria Siega-Riz, Ph.D., M.S., University of Massachusetts Amherst, Amherst, MA

Council Members Absent
Maria L. Acebal, J.D., Food Allergy Research & Education, McLean, VA
Charles P. Mouton, M.D., M.S., The University of Texas Medical Branch at Galveston, Galveston, TX

2. Liaisons

Janine A. Clayton, M.D., Director, Office of Research on Women's Health, DPCPSI
Timothy Holtz, M.D., M.P.H., FACP, FACPM, Deputy Director, Office of AIDS Research, DPCPSI, for Maureen Goodenow, Ph.D., Director, Office of AIDS Research
David M. Murray, Ph.D., Director, Office of Disease Prevention, DPCPSI
Karen L. Parker, Ph.D., M.S.W., Director, Sexual & Gender Minority Research Office, DPCPSI
William T. Riley, Ph.D., Director, Office of Behavioral and Social Sciences Research, DPCPSI
Elizabeth L. Wilder, Ph.D., Director, Office of Strategic Coordination (OSC), DPCPSI
Cindy Davis, Ph.D., Director of Grants and Extramural Activities, Office of Dietary Supplements for Joe Betz, Ph.D., Acting Director, ODS, DPCPSI
David R. Wilson, Ph.D., Director, Tribal Health Research Office (THRO), DPCPSI

3. *Ex Officio* Members Absent

Lawrence A. Tabak, D.D.S., Ph.D., Principal Deputy Director, NIH

4. Presenters

Gene Civillico, Ph.D., Program Official, OSC, DPCPSI
Francis S. Collins, M.D., Ph.D., Director, NIH
Richard Conroy, Ph.D., Program Official, OSC, DPCPSI
Stephanie Devaney, Ph.D., Deputy Director, *All of Us*℠ Research Program
Roger Glass, M.P.H., M.D., Ph.D., Director, Fogarty International Center
Susan Gregurick, Ph.D., Senior Advisor, Office of Data Science Strategy (ODSS), DPCPSI
Malgorzata Klosek, Ph.D., Director, Division of Construction and Instruments (DCI), ORIP, DPCPSI
Lora Kutkat, M.P.H., Senior Advisor, DPCPSI
Stephanie Murphy, V.M.D., Ph.D., Director, Division of Comparative Medicine (DCM), ORIP, DPCPSI
Bruce Tromberg, Ph.D., Director, National Institute of Biomedical Imaging and Bioengineering (NIBIB)
Elizabeth Wilder, Ph.D., Director, OSC, DPCPSI

5. NIH Staff and Guests

In addition to Council members, presenters, and Council Liaisons, others in attendance included NIH staff and interested members of the public.

B. Announcements and Updates

Dr. Grieder reviewed the following:

- Council members are Special Government Employees during the days of Council meetings and are therefore subject to the rules of conduct governing federal employees.

- Each Council member submitted a financial disclosure form and conflict-of-interest statement in compliance with federal requirements for membership on advisory councils. The financial disclosures are used to assess real and perceived conflicts of interest, and Council members must recuse themselves from the meeting during discussions of any items for which conflicts were identified.

- Time is allotted for discussion between the Council members and presenters, but time for comments from other meeting attendees is limited. The public may submit comments in writing; instructions are available in the *Federal Register* notice for the meeting, which was published on February 8, 2019, and updated on August 27, 2019.

- Minutes from the May 17, 2019, meeting are posted on the DPCPSI website. The minutes from this meeting also will be posted there.

C. Future Meeting Dates

Council meetings in 2020 will be held on January 24, May 15, and September 11.

II. REVIEW, DISCUSSION, AND VOTE: REVISED COUNCIL OF COUNCILS OPERATING PROCEDURES

Dr. Anderson reviewed changes to the Council of Councils operating procedures, including minor corrections and expanded information regarding concept clearances. Concept clearances are intended to gather public input on the merits of a potential research initiative. The NIH concept clearance policy has been updated to require the Council to review a broader range of funding opportunity announcements (FOAs). Previously, only requests for applications (RFAs) were reviewed by the Council. The expansion will broaden the areas of research interest the Council will review. Members always will receive a written description of the concept clearance ahead of time to prepare questions or concerns. The program officer will present at the Council of Councils meeting using a common slide template that also clarifies whether FOAs are reissues, renewals, or for new programs. Two Council members will serve as discussants, making recommendations prior to the vote. The Council may choose to accept the concepts as presented, ask for modifications, defer the concept, or disapprove the concept. For reissuances, the Council may outline missing areas. For new concepts, program staff will provide background to show the Council the innovative, crosscutting, transformative, catalytic, or unique aspects of the new initiative and how it will synergize with overall NIH and individual Institute, Center, and Office (ICO) missions. These concepts can vary in specificity—for example, ORIP concepts likely will be more specific, and Common Fund concepts might be presented at varying levels of development.

Discussion Highlights

- Dr. Grieder clarified that it is highly unlikely that any FOA reissues not supported by ORIP or Common Fund program leadership would come to the Council for clearance. Council approval would only be sought for those concepts that have support at the program level.
- Dr. Anderson agreed with the suggestion that Council members' role is reviewing the concepts from a scientific perspective, rather than considering the proposed budgets.
- Council members asked whether concept clearance presentations could include more information about both the positive and negative aspects to the concept, such as minority views, to help increase transparency in the development of the concept. Dr. Anderson explained that the Common Fund concept development process relies heavily on ICOs and ICO directors to assess which concepts fit the broad field of related science. Common Fund programs are required to transition to other sources of funding after 10 years, so ensuring that the program is of interest to ICOs helps ensure that a program can continue. He emphasized that concepts typically are informed by multiple working groups and workshops.
- Dr. Grieder suggested that the 1-page summary of each new concept include links to workshop reports to illustrate the discussion, recommendations, and other points of development. For reissues, links to the advisory board discussions could be included. Dr. Grieder cautioned that the time available to discuss concepts is limited and suggested that, for future concept clearances, Council members submit written input in advance; Dr. Anderson added that more information on the "big picture" could be included in the written materials, as well as information on the ICO's strategic plans and goals. He pointed out that Council members' wide variety of specialties necessitates more explanation of the scope of a project.
- Dr. Anderson clarified that advisory working groups comment on the concept earlier in the process, so any Council members with experience in such a group would be more familiar with assessing such facets as feasibility and appropriateness; however, Council members review the concept at a later stage in its development, so such considerations already have been addressed. He added that other ICOs develop and review their concepts using a very broad range of approaches.
- Dr. Anderson suggested that discussants could be provided with more guidance on specific aspects to consider or address at the meeting.
- Council members encouraged Dr. Anderson to ensure that the Council's approval remained an essential part of the process by providing enough information to discuss all relevant aspects of the concept.
- When asked about Council members' responsibility to compare costs or weigh priorities, Dr. Elizabeth Wilder explained that cost estimates help illustrate the intended scope of a concept, and the Council can decide that the concept's goals are not achievable or appropriate for the intended costs. She emphasized that the Common Fund shows the Council only concepts that are within its budget.
- Council members suggested adding "(both affirming and dissenting)" to the description of general background provided for new concepts on page 8 under heading 1.2 of the operating procedures, as well as similar wording for reissues.

Vote

A motion to approve the changes to the procedures—including minor corrections, the discussed changes to language, and an intent for DPCPSI to provide more context for concepts—was forwarded and seconded. The motion passed with no abstentions.

III. ORIP CONCEPT CLEARANCE: SMALL GRANT PROGRAM FOR ORIP SPECIAL EMPHASIS RESEARCH CAREER AWARD (SERCA) K01 RECIPIENTS (R03)

Stephanie Murphy, V.M.D., Ph.D., the director of ORIP's DCM, introduced a reissue of a limited competition, small grant program for ORIP veterinary scientist SERCA K01 recipients. The objective of this program is to facilitate SERCA K01 recipients' transition to independence by increasing fiscal independence, demonstrating additional success in peer review competitions, and generating additional data and publications in support of future R01 applications. The funds available and the anticipated number of awards for this program are contingent upon NIH appropriations and the submission of meritorious applications. The project award period is 2 years. As discussed in the "Biomedical Research Workforce Working Group Report" from June 2012 and further expanded upon in the "Physician-Scientist Workforce Working Group Report" from June 2014, the NIH has an interest in developing and expanding a physician-scientist workforce that includes veterinary scientists. The SERCA K01 grants supported by ORIP, in contrast to career development programs at other ICOs, are designed to specifically engage veterinary scientists—biomedical researchers with a veterinary degree—in a mentored research experience that enables them to become independent biomedical investigators. In fiscal year 2019, ORIP supported 25 active SERCA K01 awards. R03 grants have been used by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) since 2002 and more recently by the National Heart, Lung, and Blood Institute; the National Institute of Arthritis and Musculoskeletal and Skin Diseases; and the National Institute of Allergy and Infectious Diseases (NIAID) to competitively supplement career development grants, such as K01s, during the last 2–3 years of the K award. An analysis of the NIDDK R03 program from 2002 to 2014 suggests greater success in obtaining an R01 grant for K awardees who received an R03 grant. Thus, ORIP seeks to enhance the ability of its veterinary scientist SERCA K01 recipients to conduct research as they transition to becoming independent research investigators by continuing its own R03 supplement program, which was initiated in fiscal year 2017.

Discussion Highlights

- The discussants, Drs. Michael Lairmore and Susan Sanchez, provided their comments. Dr. Lairmore commented that this program aligns with ORIP's strategic goals and supports veterinary scientists as a critical part of the scientific workforce and a population that faces unique challenges in entering a research career. He recommended that ORIP continue to analyze the impact of the program but strongly recommended supporting the concept. Dr. Sanchez cautioned that it is too early to evaluate the program but concurred with Dr. Lairmore's support.
- When asked how this program would be forward-thinking, Dr. Murphy explained that participants in a 2015 workshop emphasized the variety of roles available for veterinarians in science and the broad set of skills they can use to investigate research questions. A more recent expert panel discussed how to address current needs and future directions, and a follow-on workshop is under consideration. She added that the program is considering focusing on pathways, rather than specific research areas, to enhance the multidisciplinary potential of veterinarian-scientists.

- Dr. Murphy explained the baseline data from a similar NIDDK program used to evaluate how the success of the SERCA program will increase, but she cautioned that because the first awards from ORIP were made in 2019, the program's impact cannot be evaluated yet. She clarified that similar programs at other ICOs also are modeled on the NIDDK R03 program and too new to evaluate.
- Council members recommended robust analyses of outcomes and meta-analysis with other ICOs' programs.
- Dr. Murphy clarified that this concept allows specific targeting of veterinary scientists that ORIP has invested in. The concept was developed in response to challenges as identified for veterinary scientists in the 2015 workshop, particularly the difficulty of securing research support to transition to independence.

Vote

A motion to approve the SERCA concept was forwarded and seconded. The motion passed with no abstentions.

IV. UPDATES FROM THE NIH

Francis S. Collins, M.D., Ph.D., the director of the NIH, noted recent staff changes and commented that choosing new leaders is one of his most important tasks, highlighting the importance of increasing representation for women and underrepresented minorities in these positions. He informed attendees of the new Government Executive Hall of Fame, which includes Dr. Anthony Fauci, director of NIAID. Dr. Collins also reviewed NIH's funding trajectory, noting that a 1-month continuing resolution followed by a budget increase was likely. He emphasized that NIH research produces significant returns for the investment, both economically and in terms of human health. Dr. Collins also noted the success of ongoing efforts to support early-stage investigators.

Dr. Collins provided an update on the Helping to End Addiction Long-Term (HEAL) initiative, which he noted has strong support in Congress. HEAL is an ambitious portfolio with support from many ICOs, as well as an executive committee and a multidisciplinary working group, which recommended that the program save funding for the next fiscal year to support new ideas and new investigators that may be inspired by this initiative. The Common Fund supports two projects connected to HEAL: Acute to Chronic Pain Signatures—a study to determine how to reduce the number of people whose acute pain transitions to chronic pain—and the Stimulating Peripheral Activity to Relieve Conditions (SPARC) program, addressed later in this meeting. One major initiative is HEALing Communities, a cluster-based randomized trial with matched communities in states where the opioid crisis has had significant impacts that focuses on strategies proven to improve outcomes within communities. Dr. Collins noted the inclusion of criminal justice, a field in which relatively little has been done to tackle the opioid crisis compared to the large need.

Dr. Collins updated attendees on the activities of the Advisory Committee to the Director (ACD) Artificial Intelligence Working Group, which includes many people in the earlier stages of their careers who have innovative ideas. The working group submitted initial recommendations to the ACD in June, and final recommendations will be submitted in December. Dr. Collins noted the importance of ensuring that data sets are ready to support artificial intelligence efforts, and he emphasized the importance of NIH support for researchers who are fluent in both biomedicine and computer science. The working group also recommended developing and sharing a catalog of success stories to inspire future projects and innovations.

Advances in human genome editing offer promising applications in basic and clinical science, but Dr. Collins noted that some questionable applications already have occurred. CRISPR-Cas9 use has expanded quickly in recent years; it is easy to use and produces sophisticated and accurate results. Dr. Collins commented on the possibilities offered for solutions to genetic diseases with this technology, including the Common Fund's project on somatic cell gene editing. He noted the recent success of a treatment for sickle cell disease in one patient and emphasized that gene editing technology could provide cures much more efficiently; one approach using CRISPR-Cas9 to reduce the effects of sickle cell disease is now being tested in humans. However, experiments conducted in China with this technology led experts to release statements encouraging an international moratorium on experiments in heritable genome editing for at least 5 years, which allows the time to study and consider all the scientific and social arguments related to this possibility. Dr. Collins emphasized the need to proceed with caution regarding alterations to basic human biology.

Dr. Collins noted that although international collaborations in research are critical, evidence has shown clearly that in some instances, the United States has been taken advantage of in its openness to collaboration. Investigation of these situations has revealed that NIH grantees do not always appropriately declare substantial support from other countries. An ACD working group submitted a report on this topic about a year previously and the NIH is continuing to assess this issue. Dr. Collins pointed out that although this concern applies to a tiny fraction of the NIH workforce and international collaborations remain critical, improving this process must be done in a responsible and unbiased way.

Dr. Collins also commented on the 2018 report by the National Academies of Sciences, Engineering, and Medicine showing the extent to which sexual harassment and related actions occur in the scientific workforce. The NIH conducted its own survey shortly afterward, with similar findings. He noted the need to change the culture of how those within the scientific workforce approach these issues. A working group on this topic submitted interim recommendations this summer and will make final recommendations in December. Dr. Collins commented that although some of the interim recommendations are controversial, these situations need to be addressed responsibly to move forward. He also reminded attendees of his recent pledge to no longer participate in panels comprising only men, which many other leaders of the community now have agreed to as well.

Discussion Highlights

- Dr. Collins elaborated on the success of the Common Fund, noting that the High-Risk, High-Reward Research Program is more productive than R01s. He added that, to change the culture, ICOs must adopt the same attitude toward innovation, and he noted the need to continually push for multidisciplinary efforts to spark creativity.
- When asked about transdisciplinary research with other agencies, Dr. Collins responded that the NIH has tried its best to build those relationships and emphasized that they remain a high priority.
- Dr. Collins clarified that the NIH survey on workplace culture was intended to form a baseline for improvement. Online training is one strategy to move forward, but its actual effects on behavior are unknown, so other interventions are necessary. Dr. Collins noted the effort to create an open opportunity for submitting complaints of harassment, which already has led to significant job interventions. He commented that although this is an experiment, the interventions must have muscle and methods to hold the NIH accountable for changing the culture.
- In response to a question about successful strategies for early-stage investigators, Dr. Collins explained that ICOs were given flexibility on how they reach the 25 percent success rate of early-stage investigators, but many were consistent in the strategies they chose. He emphasized the importance of engaging a competitive spirit by allowing ICOs to view each other's success rates.

- In response to a question about increasing recruitment of women and people from underrepresented populations, Dr. Collins emphasized the importance of treating this as a strategic goal. He explained a new program for intramural researchers in which a group of 10 junior faculty from underrepresented groups were recruited as a cohort, providing some critical mass. Discussions also are occurring with Dr. Hannah Valantine, the Chief Officer for Scientific Workforce Diversity, to develop a similar program for the extramural community.
- When asked about the success of recruiting young investigators from underrepresented groups, Dr. Collins acknowledged that the NIH is not as successful as it should be. He emphasized that diversity increases productivity and suggested that all institutions have a responsibility to support diverse recruitment at every stage. Dr. Collins also emphasized tools created by Dr. Valantine to help recruiters discover qualified applicants outside their standard networks and encouraged Council members to share these tools at their home institutions.
- Dr. Collins clarified that artificial intelligence applications will include all types of data with the potential to provide insights, including genomic data and electronic health records (EHRs) when shared with permission. He noted that any initiatives will depend on what data people are willing to make available and will be appropriately consented. He added that the members of the working group are ensuring that guidelines are in place for responsible use of data.
- When asked how to create a metric that considers both the traditional considerations of success in academic research (e.g., publications) and participation in new multidisciplinary efforts to measure the success of junior faculty, Dr. Collins agreed that traditional methods of evaluation are outdated. He noted NIH's expansion of the biosketch format as a step forward but acknowledged that much work remains.

V. ORIP CONCEPT CLEARANCE: SHARED INSTRUMENTATION GRANT PROGRAM (S10)

Malgorzata Klosek, Ph.D., the director of ORIP's DCI, explained that the Shared Instrumentation Grant program supports acquisitions of scientific instruments to be used on a shared basis, including any instrument that can be justified by a group of NIH-funded investigators. Dr. Klosek remarked on the history of the program, noting that average annual funding is 100–110 applications at a budget of $65–70 million. The impact of the program can be measured via the number of institutions that host S10-funded instruments, the number of investigators using the instrument, the type and breadth of technologies made available through the program, and the high-profile publications supported by the use of these instruments.

Discussion Highlights

- The discussants, Drs. Sachin Kheterpal and Jean Schaffer, provided their comments. Dr. Schaffer commended the program's success in providing state-of-the-art equipment across broad fields and supported continued funding. Dr. Kheterpal agreed, commending the program's efforts to reach underfunded states and the intent to fund infrastructure. He asked Council members to consider whether the program is achieving the proper balance of awarding those researchers who have received other awards versus supporting underfunded organizations. Dr. Klosek noted that the program does not receive enough applications from underfunded states; outreach is an important component of the program, but she acknowledged that they could be more proactive in generating research support.
- When asked whether the program is fulfilling its original intentions, Dr. Klosek explained that the program has evolved since its creation in 1982, and instruments have become more expensive

than individual investigators can afford, necessitating a program that collaboratively supports research initiatives.

- Council members questioned whether the requirement that an application include three R01-level investigators intending to use the instrument should be relaxed, particularly for investigators in Institutional Development Award (IDeA) program states, where three individuals geographically near a piece of equipment may not be possible. Dr. Klosek noted that many applicants from IDeA states do not reapply, so the program is working to encourage resubmissions.
- When asked whether budgets would increase to match increasing instrument costs, Dr. Klosek explained that this issue was discussed with the program advisory panel during strategic plan development; the panel decided not to raise the budget at this time, in part because the institutional commitment required to support more expensive instruments would limit the number of institutions that could apply. Dr. Anderson added that other approaches to address costs by changing strategies for structural biology have been implemented.

Vote

A motion to approve the Shared Instrumentation Grant program was forwarded and seconded. The motion passed with no abstentions.

VI. ORIP CONCEPT CLEARANCE: RESOURCE CENTERS (P40/U42/U54)

Dr. Murphy explained that the Animal Models and Animal and Biological Materials Center and Resource programs support special colonies of laboratory animals and animal-related models, as well as other resources, such as informatic tools; reagents; cultures of cells, tissues, and organs; and genetic stocks that serve the biomedical research community in a variety of research areas on a national basis. The funds available and the anticipated number of awards for these programs are contingent upon NIH appropriations and the submission of meritorious applications, and the award project period is 4–5 years. Dr. Murphy provided examples of the diverse centers supported by ORIP through this program, including the National Natural Toxins Research Center, the Caribbean Primate Research Center, the Rat Resource and Research Center, the National *Xenopus* Resource Center, the Zebrafish International Resource Center, the Bloomington *Drosophila* Stock Center, the National Swine Resource and Research Center, the Specific Pathogen-Free Macaque Breeding Colonies, and the Human Tissue and Organ Research Resource. ORIP also supports pilot centers for precision disease modeling at the Jackson Laboratory, Mount Sinai Hospital, and the Memorial Sloan Kettering Cancer Center, which support collaborative research that links current personalized medicine efforts in human subjects with advances in animal genomics and technologies for genetic manipulation and creation of interspecies somatic hybrids.

Discussion Highlights

- The discussants, Drs. Paul Johnson and Terry Magnuson, provided their comments. Dr. Magnuson encouraged the funding of this concept to support the recent advances in developmental biology and disease biology. Dr. Johnson agreed, encouraging Dr. Murphy to work on developing metrics that encompass the entire range of science supported by these resources and to further emphasize how this program supports rigor and reproducibility.
- In response to a question about naturally occurring disease models, Dr. Murphy clarified that because ORIP's mission is trans-NIH, these centers have to be of primary interest to two or more ICs as stated in the funding opportunity announcement. Naturally occurring disease models are very specific, with ICs focused on specific diseases that are relevant to their mission.

- When asked how the centers originate, Dr. Murphy explained that many of the needs are defined by the community, including via workshops with multiple communities that illuminate common needs. Peer and council reviews also help define relevant and broad needs, and needs are reevaluated as appropriate.
- Dr. Murphy explained that the initiatives are publicized via a series of fact sheets, and outreach also has been conducted within and outside the NIH. Outreach is a new and emerging theme for future directions in ORIP's strategic plan.

Vote

A motion to approve the reissue of the Animal Models and Animal and Biological Materials Center and Resource programs concept was forwarded and seconded. The motion passed with no abstentions.

VII. ORIP CONCEPT CLEARANCE: MUTANT MOUSE RESEARCH AND RESOURCE CENTERS (MMRRC) CONSORTIUM—LIMITED COMPETITION

Dr. Murphy explained that the MMRRC and the Informatics Coordination and Service Center (ICSC) support the continued acquisition, distribution, and cryopreservation of scientifically valuable, genetically engineered mouse strains and mouse embryonic stem cell lines. The funds available and the anticipated number of awards will include as many as four centers and the ICSC, contingent upon NIH appropriations. The award project period is for 5 years. She explained that the MMRRC Consortium consists of four centers located at the University of North Carolina Chapel Hill; University of Missouri; University of California, Davis; and the Jackson Laboratory. The ICSC is located at the University of California, Davis, and provides informatics and coordinating services to support the function and activities of the MMRRC Consortium. Dr. Murphy reviewed data showing the impact of the MMRRC's collection of approximately 45,000 unique mutant alleles, submitted as live mice, frozen germ plasm, and embryonic stem cells. Over the past 11 years, the MMRRC has received more than 12,000 requests from about 7,500 unique investigators at about 4,000 research institutions. Submissions and users have increased over the past 8 years, and these resources have been used in NIH-supported grants from 21 ICOs.

Discussion Highlights

- The discussants, Drs. Kristin Ardlie and Paul Johnson, provided their comments. Dr. Johnson emphasized that this is a unique resource that can be provided only by the NIH and ORIP and supported reissuance. He requested additional information about the program's evolution and the predicted challenges for the next 5 years, as well as clearer metrics of success. Dr. Ardlie concurred with Dr. Johnson's support, asking about requirements to deposit data and requirements for nonprofit use.
- Dr. Murphy explained that the program prioritizes support for NIH-supported investigators, followed by federally supported, not-for-profit, and for-profit investigators in that order. Metrics are determined by the ICSC, but this information will be included in future concept clearance materials. Dr. Oleg Mirochnitchenko commented on the future directions of the MMRRC.
- Dr. Magnuson who identified himself as a member of the MMRRC consortium commented on the mouse universal genotyping array, which can be used on donated mice to identify the genetic background. He noted that the ability of CRISPR-Cas9 to allow researchers to create new mice requires strict characterization for rigor and reproducibility.

Vote

A motion to approve the reissue of MMRRC and the ICSC was forwarded and seconded. The motion passed with no abstentions.

VIII. REVIEW OF GRANT APPLICATIONS

This portion of the meeting was closed to the public, in accordance with the provisions set forth in Sections 552(b)(c)(4) and 552(b)(c)(6), Title 5, U.S. Code and Section 10(d) of the Federal Advisory Committee Act, as amended (5 U.S.C. Appendix).[1] Members were instructed to exit the room if they deemed that their participation in the deliberation of any matter before the Council would represent a real or perceived conflict of interest. Members were asked to sign a conflict-of-interest/confidentiality certification to this effect. The *en bloc* vote for concurrence with the initial review recommendations was affirmed by all Council members present. During the closed session, the Council concurred with the review of 170 ORIP applications with requested first-year direct costs of $735,743,530.

IX. COMMON FUND CONCEPT CLEARANCE: HARNESSING DATA SCIENCE FOR HEALTH DISCOVERY AND INNOVATION IN AFRICA (DSI FOR AFRICA)

Roger Glass, M.D., Ph.D., M.P.H., the director of the Fogarty International Center, commented on the opportunities for change and innovation in Africa, which has both a large geographic area and high rates of economic and population growth. Africa also carries a disproportionate percent of the global burden of disease, and its many unique populations have a variety of genetic backgrounds and exposures. The continent has a critical medical workforce shortage, extensive mobile phone coverage, and opportunities for unique leapfrog technologies, as well as the opportunity to build on investments the NIH has made over the past 10 years, but it is unencumbered by legacy infrastructure. Ethical, legal, and social implications (ELSI) are key contextual factors. Dr. Glass explained the Fogarty International Center's collaborations in Africa and emphasized the importance of working with national governments; he also noted that, although the NIH invests substantially in data science, few of its grants focus on Africa.

The DSI for Africa initiative includes six research hubs focused on key health problems, data science training programs, assessments of the ELSI context, and a coordinating center, as well as symposia in the early years and papers in later years. Bruce Tromberg, Ph.D., the director of the NIBIB, explained that each of the six hubs would connect partners from government, industry, and universities—whether in Africa or around the world—and use multiple competencies to focus on a single disease. He explained several new technologies that can be combined to improve health, including the use of smartphones as health monitors. Dr. Tromberg also commented on the planned training program, which would facilitate the interdisciplinary activities within the network.

Dr. Glass explained the deliverables expected from this initiative, including policy advances related to data, innovative projects, interdisciplinary collaborations, tool development capacity, artificial intelligence related to each issue, and networks of scientists and institutions, as well as new knowledge and interventions to improve health. Dr. Glass provided some examples and noted that this project is

[1] For the record, it is noted that members absented themselves from the meeting when the Council discussed applications (a) from their respective institutions or (b) in which a conflict of interest may have occurred. This procedure applied only to applications that were discussed individually, not to *en bloc* actions.

synergistic with the investments of multiple ICOs. He emphasized that it is crosscutting and unique, and the Common Fund's ability to form partnerships will ensure that this initiative is catalytic.

Discussion Highlights

- The discussants, Drs. Kevin Johnson and Maria Araneta, provided their comments. Dr. Johnson expressed his excitement about the proposal and its ability to integrate existing NIH funding, noting that the goals are consistent with Common Fund program criteria and the initiatives already underway with non-NIH partners. He encouraged the inclusion of a sustainability plan and a higher budget for training.
- Dr. Araneta suggested partnerships with the NIDDK and with countries outside Africa to recruit the best talent. She questioned whether scientists fluent in English would have an advantage over scientists from countries that use other languages. Dr. Araneta also recommended instituting a referral system within the network. She concurred with Dr. Johnson's suggestion to increase the budget for training.
- When asked why the NIH is the best center for the initiative rather than one of the existing partners, Dr. Glass explained that national governments have gathered data they are not using well, and other non-NIH groups have initiatives in digital health, but this project would integrate those disparate efforts. He emphasized that the initiative will work with local industry and infrastructure to bridge existing gaps. Dr. Tromberg added that investment in bringing engineering and physical science experts toward the biomedical space is needed to drive new technologies forward.
- Council members suggested that advances could be made within this program in ways that are not possible in the United States because of insurance restrictions. Dr. Tromberg explained that health needs currently are being met by less expensive and more accessible technologies, which can be used in low- and middle-income countries to move the technology forward. Dr. Glass noted the intent to return technologies and ideas developed through this process to the United States.
- Council members recommended including more support for integrating women into these initiatives within patriarchal societies and investigating collaborations with military and medical school programs that have established global health networks.
- Council members commented on the lack of explicit community engagement strategies in the concept; they also encouraged more embedding of ELSI strategies throughout the hubs and consideration for data-sharing challenges between countries.

Vote

A motion to approve the DSI for Africa concept, considering the suggestions discussed, was forwarded and seconded. The motion passed with no abstentions.

X. COMMON FUND CONCEPT CLEARANCE: COMMON FUND DATA ECOSYSTEM—ENGAGING DATA COORDINATING CENTERS

Elizabeth Wilder, Ph.D., the director of the OSC, explained that this initiative is intended to add value to many Common Fund programs. The Common Fund currently supports multiple data coordinating centers for its large data-generating efforts, which results in inefficiencies and lost scientific opportunities. The Data Commons Pilot Project was intended to make NIH data sets findable, accessible, interoperable, and reusable (FAIR), and this project helped develop a metric for judging whether data are FAIR. NIH's

broader data-science strategies have moved to the ODSS, allowing the Common Fund to refocus its data efforts. The data coordinating centers developed a report, from which the concept for a Common Fund Data Ecosystem emerged.

Lora Kutkat, M.P.H., a senior advisor in DPCPSI, explained that cloud computing systems allow information-sharing across geographic systems aligned with FAIR principles. She elaborated on recent assessments of data needs and sustainability. The Common Fund Data Ecosystem proposes to engage multiple data coordinating centers to make data interoperable, enable investigation of scientific questions across data sets, and increase the reuse of data and tools after a Common Fund program ends.

Discussion Highlights

- The discussants, Drs. Kevin Johnson and Terry Magnuson, provided their comments. Dr. Johnson expressed enthusiasm for the concept but wondered if interoperability was possible, recommending particular attention to selecting a model that standardizes meaningful data elements. Dr. Magnuson also supported the concept. Dr. Wilder clarified that part of the concept involves identifying which data coordinating centers are interested in participating in this effort, as it is an "opt-in" effort based on needs identified by the data coordinating centers.
- Council members discussed known potential areas in which data could be synchronized, and Dr. Johnson commented that this information should be expanded upon for the concept, such as by changing the funding strategy to require collaboration between data coordinating centers through team proposals that work toward mutual goals.
- When asked whether this strategy can be applied across the NIH in the long term, Dr. Wilder commented that similar efforts are occurring across the NIH, and each ICO is determining how best to move forward with its data sets.
- Council members recommended improving portability and accessibility to outside users, as well as gathering their input. Dr. Wilder emphasized that the intent of this project is not to create another silo but to work together with the ODSS and other users to ensure access.
- Dr. Wilder clarified that this concept asks the data coordinating centers to define the data specifications. She emphasized that the awards will be flexible enough to allow adaptations after the data coordinating centers begin collaborating, but this concept is needed to start building the data ecosystem. She agreed that applications from data coordinating centers can include a component about how they will engage users, and data science experts will be involved.

Vote

A motion to approve the Common Fund Data Ecosystem concept, considering the suggestions discussed, was forwarded and seconded. The motion passed with no abstentions.

XI. ESTABLISHING A SEQUENCE READ ARCHIVE (SRA) DATA WORKING GROUP OF THE COUNCIL OF COUNCILS

Susan Gregurick, Ph.D., a senior advisor in the ODSS, explained that the SRA archives raw samples from next-generation sequencing experiments for a variety of organisms from several platforms as a starting point for secondary analysis and an entry point for human clinical samples for authorized users. The SRA is growing quickly in both users and amount of data, resulting in increases in the cost of data storage. This proposal requests recommendations for SRA's current activities, future plans, and opportunities. The charge for the working group is to consider how to identify solutions to maintain the efficiency of the storage footprint. In the short term, the ODSS would like a draft report by January 2020, and in the longer

term, other uses for the SRA, technical recommendations, data recommendations, and future usage can be identified.

No discussion points for this proposal were raised. Dr. Anderson noted that a Council member will serve as co-chair and asked interested members to contact him or Dr. Gregurick.

Vote

A motion to approve the establishment of a Council of Councils working group for the SRA was forwarded and seconded. The motion passed with no abstentions.

XII. COMMON FUND FOA: TARGETED NEEDS FOR SPARC PROGRAM GOALS

Gene Civillico, Ph.D., a program official with OSC, requested clearance for a new FOA in the SPARC (Stimulating Peripheral Activity to Relieve Conditions) program to address targeted needs within the original scope but not sufficiently addressed by existing activities. Dr. Civillico reviewed the history of SPARC, a program to study the mechanistic basis for neuromodulation therapies. The Common Fund supports SPARC because its studies do not easily fit within the mission of a single ICO. Dr. Civillico provided examples of some activities within the program, noting that the new FOA would include improvements in precision, support FAIR data, and improve the ability to run simulations in the cloud.

Discussion Highlights

- The discussants, Drs. Linda Chang and Paul Kenny, provided their comments. Dr. Chang expressed her support for the initiative, as did Dr. Kenny, with both discussants recommending more specificity in the proposal and collaboration with experts.
- Dr. Civillico clarified that other agencies have different mandates that complicate what treatments they approve and reimburse. However, SPARC places more emphasis on discovery of fundamental phenomena, which may not always align with the kinds of treatments accepted by other agencies. He also noted that SPARC prioritizes data generation, annotation, and sharing, rather than more traditional metrics of productivity, such as publications.
- Dr. Civillico commented on potential overlap between SPARC and Human Biomolecular Atlas Platform (HuBMAP) studies, noting differences between the programs and added that discussions are underway to ensure that efforts are not duplicated. He added that data generated in these programs would fall under the data-sharing principles of the Common Fund Data Ecosystem.

Vote

A motion to approve an FOA for targeted needs within SPARC was forwarded and seconded. The motion passed with no abstentions.

XIII. COMMON FUND FOA REISSUES: HuBMAP—TRANSFORMATIVE TECHNOLOGY DEVELOPMENT AND TISSUE MAPPING CENTERS

Richard Conroy, Ph.D., a program official with OSC, explained that the Transformative Technology Development FOA is designed to accelerate early-stage technology development which, if successful, will be incorporated into the HuBMAP program. The Tissue Mapping Center FOA is designed to support data generation and provide comprehensive high-resolution biomolecular information to enable three-dimensional mapping of human tissues. Dr. Conroy reviewed the history of HuBMAP, which aims to catalyze development of a comprehensive atlas of cellular organization in human tissues to elucidate the

relationship between tissue organization and function. Over the past 2 years, significant enhancements in the depth, resolution, and throughput of the technologies have occurred. Dr. Conroy explained that, by reissuing the Tissue Mapping Center FOA, gaps can be filled and the diversity among tissue donors can be increased. He noted the intent to support the study of multiple tissues from the same donor, an area that was not explicitly identified in the previous FOA but has the potential to answer many important biological questions. The FOA also would encourage more multiscale approaches and increased emphasis on tissues not currently studied within the consortium or by other large programs.

Dr. Conroy provided an example of a study funded under the previous Transformative Technology Development FOA, noting that the RFA asks for technologies with no proof of principle in the published literature, which would support applications from early-stage investigators. He also provided an example of the work currently conducted under the Tissue Mapping Center FOA. He reiterated that the NIH HuBMAP Working Group is asking the Council to approve reissue of both RFAs in accordance with the overall roadmap for the program, with minor modifications as described in the presentation. Growing the program gradually in this manner allows it to take advantage of new techniques and technologies quickly. These reissues also would address some of the gaps in building a comprehensive view of biomolecular distribution in human tissues.

Discussion Highlights

- The discussants, Drs. Rick Horwitz and Gary Koretsky, provided their comments. Dr. Horwitz wondered whether the Transformative Technology Development FOA was too small and not transformative enough compared to efforts at other institutions. However, he agreed that the Tissue Mapping Centers initiative is important and funded at a scale that can lead to accomplishments. Dr. Koretsky concurred with these points.
- Dr. Conroy emphasized that the areas covered by this FOA would not overlap with efforts at other institutions—the program intends to select niche areas that fit within the overall mission and are likely to be important in the future. He added that program staff are conscious of the need to ensure that HuBMAP data, which largely focus on non-diseased tissues, can be used alongside data from programs focused on particular diseases or pathologies. He also emphasized the importance of the collaborative and coordinating aspects of the proposal.
- Dr. Conroy clarified that the program does not intend to compare HuBMAP results to existing tissue mapping for the mouse, but this could be one of the use cases for the data in the future.
- When asked how the first round of applications addressed the difficulty of obtaining tissue samples from living individuals, Dr. Conroy clarified that the three sources of tissue are as by-products of surgery, from rapid autopsies, and from transplants. He explained that they use a "tissue score card" depending on tissue type and variable rates of decay. This process allows the program to standardize the details of how tissues are collected across groups.
- Dr. Anderson emphasized that this program is known to be an international matrix of disparate efforts, and part of its efforts involve the social experiment of communicating and working with many groups.

Vote

A motion to approve reissue of the Tissue Mapping Centers FOA was forwarded and seconded. The motion passed with no abstentions.

A motion to approve reissue of the Transformative Technology Development FOA, with vigilant attention to preserving the uniqueness of NIH's investment and purposeful structure, was forwarded and seconded. The motion passed with 11 votes in favor and 6 votes against.

XIV. UPDATE ON THE *ALL OF US* RESEARCH PROGRAM

Stephanie Devaney, Ph.D., the deputy director of the *All of Us* program, explained that the program currently has about 251,000 participants who have consented to the longitudinal research study and more than 190,000 who have supplied a blood sample. More than 80 percent of those are from groups underrepresented in biomedical research, including more than 51 percent from racial and ethnic minority populations. Recent achievements include the 1-year anniversary of the program's national launch and the publication of its marker paper, as well as the launch of the beta version of the public data browser.

When participants join the program, they follow an electronic consent process, including consent to use their EHRs; Dr. Devaney noted that *All of Us* captures EHRs every quarter and has invested strongly in this function because of the difficulty of capturing EHRs from all providers. Participants then complete surveys on their basic demographics, overall health, and lifestyle and behavior. Additional surveys on medical history and health care access have been implemented recently, and other surveys likely will be added over time for both new metrics and reassessments. Participants then visit one of the in-person enrollment centers for physical measurements and biological samples. Dr. Devaney noted that *All of Us* is exploring digital health technologies as well.

All of Us focuses on both enrolling and retaining 1 million participants, and determining the program's retention and how to maintain it is one of the biggest current challenges. The program also prioritizes the participant experience, which is improved through such strategies as innovative ways to recruit and sample participants in areas without enrollment centers and consulting with THRO to ensure that the program is inclusive. An important current effort is the implementation of the program's genomics plan, including whole-genome sequencing on all participants. Three genome centers and a genetic counseling resource have been funded; a pilot of 25,000 participants reflecting the diversity of the study will be the first project when the preparations have been finished. Dr. Devaney explained that return of information will be the participant's choice, and the program currently is working to define what types of information will be returned in the initial stages. She reminded attendees that the public version of the research hub recently had become available and could be used to assess the current state of the cohort in aggregate. The next level of access for the data will be the Researcher Workbench, which will launch in a beta version when policies and community expectations have been arranged. Dr. Devaney emphasized that the data will be accessible by any authorized user who follows the required training and transparency processes.

Discussion Highlights

- Dr. Devaney clarified that *All of Us* has a partnership with the Veterans Administration (VA), which enrolls participants from seven sites. Some of these VA participants also participate in the Million Veterans Program, but they follow the standard *All of Us* protocol, and no other data from large research cohorts are currently being incorporated.
- When asked about ways consent and reporting may change as participants age, Dr. Devaney explained that the policies around facilitated participation are designed to include legal representatives, and support staff will be made available to help participants with surveys.
- In response to a question about areas of low enrollment, Dr. Devaney clarified that participants from all 50 states have joined, and the program is working hard to improve the direct volunteer pathway and ensure that participants can enroll from anywhere.
- When asked about enrolling participants who are pregnant, Dr. Devaney explained that *All of Us* participants who are pregnant or become pregnant during the study will be offered the opportunity to enroll in PregSource, a cohort at the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development.

- In response to a question about misuse concerns, Dr. Devaney noted the program's concerns and explained that users are not allowed to download the data.
- Dr. Devaney clarified that researchers ultimately will be allowed to access specimens or biosamples, but those policies have not yet been designed.
- In response to a question about the shortage of genetic counselors, Dr. Devaney explained that although *All of Us* cannot fund training, inclusion of genetic counselors in its process may prompt growth in the field of genetic counseling. She added that the first pilot project will provide critical information about capacity in this area; counselors will be able to help participants find health care providers if necessary. Although the program is focused on genetic variants with high evidence of actions that can be taken, some susceptibility genes will be addressed by the genetic counselors.
- When asked whether the program would address environmental exposure, Dr. Devaney commented that such a study could be conducted in the future, but not all assays or reassessments the program will conduct over time have been identified.

XV. CLOSING REMARKS

Dr. Anderson thanked the Council members and speakers for their contributions at this meeting. He reminded the members that the next Council meeting is scheduled for January 24, 2020.

XVI. ADJOURNMENT

Dr. Anderson adjourned the meeting at 4:15 p.m. on September 6, 2019.

XVII. CERTIFICATION

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

James M. Anderson -S

Digitally signed by James M. Anderson -S
Date: 2020.01.16 18:36:06 -05'00'

James M. Anderson, M.D., Ph.D.
Chair, NIH Council of Councils
Director, DPCPSI, OD, NIH

Date

Franziska B. Grieder -S

Digitally signed by Franziska B. Grieder -S
Date: 2020.01.16 15:13:42 -05'00'

Franziska B. Grieder, D.V.M., Ph.D.
Executive Secretary, NIH Council of Councils
Director, ORIP, DPCPSI, OD, NIH

Date