

**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
November 8, 2010**

Meeting Minutes

I. WELCOME

James M. Anderson, M.D., Ph.D., Chair, welcomed participants, NIH staff members, and members of the public to the meeting of the Council of Councils (the Council). The meeting opened at 9:05 a.m. on Monday, November 8, 2010, in Building 31, 6th Floor, Room 6, on the NIH Campus, Bethesda, Maryland.

A. Attendance

1) Council Members Present

Chair: JAMES M. ANDERSON, M.D., Ph.D., Director, DPCPSI, OD, NIH

Executive Secretary: ROBIN KAWAZOE, Deputy Director, DPCPSI, OD, NIH

STEPHEN L. BARNES, Ph.D., University of Alabama at Birmingham

DONNA BATES BOUCHER, Bates Group, Inc., Denver, CO

ELIZABETH B. CONCORDIA, M.A.S., University of Pittsburgh Medical Center,
Pittsburgh, PA

*RICHARD L. EHMAN, M.D., Mayo Clinic College of Medicine, Rochester, MN

*JACK A. ELIAS, M.D., Yale University School of Medicine, New Haven, CT

CECILE A. FELDMAN, D.M.D., M.B.A., University of Medicine and Dentistry of
New Jersey, Newark, NJ

*GARRET A. FITZGERALD, M.D., University of Pennsylvania, Philadelphia, PA

DANIEL H. GESCHWIND, M.D., Ph.D., David Geffen School of Medicine,
University of California, Los Angeles (by telephone)

MAE O. GORDON, Ph.D., Washington University School of Medicine, St. Louis,
MO

*PETER J. HOTEZ, M.D., Ph.D., The George Washington University, Washington,
DC

*MARK O. LIVELY, Ph.D., Wake Forest University School of Medicine, Winston-
Salem, NC

*HERBERT KIM LYERLY, M.D., Duke University Medical Center, Durham, NC

JEAN MCSWEENEY, Ph.D., R.N., F.A.H.A., F.A.A.N., University of Arkansas
Medical Sciences, Little Rock, AR

JUANITA L. MERCHANT, M.D., Ph.D., University of Michigan, Ann Arbor, MI

*REGIS O'KEEFE, M.D., Ph.D., University of Rochester School of Medicine and
Dentistry, Rochester, NY

*REGINA RABINOVICH, M.D., Bill & Melinda Gates Foundation, Seattle, WA

DAVID VALLE, M.D., Johns Hopkins University School of Medicine, Baltimore, MD

JOHN W. WALSH, Alpha-1 Foundation, Miami, FL

GARY L. WESTBROOK, M.D., Oregon Health and Science University, Portland, OR

*TERRIE FOX WETLE, PH.D., Brown University Medical School, Providence, RI

LUTHER WILLIAMS, PH.D., Tuskegee University, Tuskegee, AL

MARINA E. WOLF, PH.D., Rosalind Franklin University of Medicine and Science, North Chicago, IL

*Appointment pending

2) Council Members Absent

ENRIQUETA C. BOND, PH.D., Burroughs-Wellcome Fund, Research Triangle Park, NC

*JORDAN COHEN, M.D., The George Washington University, Washington, DC

DAVID W. CRABB, M.D., Indiana University School of Medicine, Indianapolis, IN

EDWIN FLORES, PH.D., J.D., Chalker Flores, LLP, Dallas, TX

JOSEPH H. GRAZIANO, PH.D., Columbia University, New York, NY

*Appointment pending

3) Ad Hoc Representatives

DEBORAH H. OLSTER, PH.D., Acting Director, Office of Behavioral and Social Sciences Research, DPCPSI, OD

BARNETT S. KRAMER, M.D., M.P.H., Director, Office of Disease Prevention, DPCPSI, OD

VIVIAN W. PINN, M.D., Director, Office of Research on Women's Health, DPCPSI, OD (Absent) (Represented by LISA BEGG, PH.D.)

JACK WHITESCARVER, PH.D., Director, Office of AIDS Research, DPCPSI, OD (Absent)

ELIZABETH L. WILDER, PH.D., Deputy Director, Office of Strategic Coordination, DPCPSI, OD

4) Ex Officio Member

LAWRENCE A. TABAK, D.D.S., PH.D., Principal Deputy Director, NIH

5) Presenters in Attendance

PAUL A. SIEVING, M.D., PH.D., Director, National Eye Institute and Co-Chair, Common Fund Nanomedicine Working Group

EHUD ISACOFF, PH.D., Professor of Neurobiology, University of California at Berkeley

6) Institute and Center (IC) and Office Directors Present

JAMES BATTEY, JR., M.D., PH.D., Director, National Institute on Deafness and Other Communication Disorders

JOSEPHINE P. BRIGGS, M.D., Director, National Center for Complementary and Alternative Medicine

PATRICIA GRADY, PH.D., R.N., Director, National Institute of Nursing Research

PAUL A. SIEVING, M.D., PH.D., Director, National Eye Institute and Co-Chair, Common Fund Nanomedicine Working Group

7) NIH Staff and Guests

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

B. Meeting Procedures

Ms. Robin Kawazoe reviewed the following:

- Each of the appointed Council participants has completed and submitted a conflict of interest statement as a Federal requirement for membership on individual IC advisory councils.
- Time has been allotted for discussion between the Council and presenters, but time for comments from other meeting attendees is limited. The public can submit comments in writing; instructions are available on the OPASI Web site and in the *Federal Register*.
- Council members should not speak on the Council's behalf or on activities not yet cleared by Council.
- The Council will hold one to two in-person meetings per fiscal year, supplemented by emails, teleconferences, and Web postings.
- The meeting minutes will be posted on the DPCPSI Web site.

C. Future Meeting Dates

DPCPSI is polling Council members regarding 2-day face-to-face meetings to be held in June 2011 and June 2012 to review Common Fund concepts and conduct second-level reviews of Transformative R01 (T-R01) applications. Final dates will be posted on the DPCPSI Web site.

Meeting dates have been reserved for November 14–15, 2011, and November 15–16, 2012 in case second in-person meetings are required each fiscal year.

D. Announcements

- Council members Ronald Arenson, Bevra Hahn, Mary Hendrix, Arthur Kleinman, Joseph Loscalzo, Orien Reid, Daria Mochly-Rosen, Martin Rosenberg, and Richard Rudick rotated off the Council effective October 31, 2010.

II. REMARKS FROM THE NIH PRINCIPAL DEPUTY DIRECTOR: THE ROLE OF THE COUNCIL OF COUNCILS

Dr. Lawrence Tabak, Principal Deputy Director of NIH, shared a historical perspective of DPCPSI, beginning with its previous incarnation, the Office of Portfolio Analysis and Strategic Initiatives (OPASI). Established in 2002, OPASI was home to the NIH Roadmap for Medical Research. The first Roadmap efforts focused on the themes of new pathways to discovery, research teams of the future, and re-engineering the clinical

research enterprise. Implementation of the Roadmap considered whether its initiatives were truly transforming; whether the NIH could afford *not* to undertake them; whether the initiatives would be compelling to stakeholders, especially the public; and whether the initiatives would position the NIH as doing something no other entity could do. Subprojects within the Roadmap have given rise to present-day programs such as the NIH Pioneer Award and the Clinical and Translational Science Awards (CTSAs).

In the NIH Reform Act of 2006, Congress further supported the principles of transformative and cross-cutting research by establishing DPCPSI to recommend cross-cutting, trans-NIH initiatives. Part of DPCPSI's role is to administer the Common Fund, which supports initiatives such as the Human Microbiome Project, the Molecular Libraries Project, and programs to support high-risk-high-reward (HRHR) research. Current funding for the Common Fund is \$544 million.

III. REFLECTIONS OF THE DPCPSI DIRECTOR

Dr. Anderson reviewed the organization and mission of DPCPSI and introduced the day's goals of describing the Division's experiences with the Common Fund and seeking feedback from the Council of Councils on capturing truly transformative research questions. He noted that the establishment of DPCPSI in the NIH Reform Act of 2006 represented an evolution of OPASI. He further pointed out that NIH Institutes and Centers (ICs) have always supported trans-NIH initiatives, but that DPCPSI was established to carry out such initiatives at a much larger scale.

The mission of DPCPSI is to identify emerging scientific opportunities, rising public health challenges, and scientific knowledge gaps that merit future research; support and develop tools to conduct portfolio analysis and priority setting; plan and implement initiatives supported by the Common Fund; and support evaluation of programs across NIH. The following functions of evaluation and portfolio analysis reside within the immediate office of the DPCPSI Director:

Evaluation and Performance

- Manage evaluation set-aside programs, including the review and funding of evaluation proposals.
- Provide hands-on technical support and guidance on design and methodological issues in evaluation.
- Conduct special projects to evaluate program performance, assess trans-NIH initiatives, and conduct needs assessments.
- Organize workshops to strengthen NIH's capacity to evaluate programs and bring together the evaluation community to identify lessons learned and best practices.
- Coordinate and prepare annual plans and reports required by the Government Performance and Results Act (GPRA).

Portfolio Analysis

- Develop and disseminate capabilities to extract novel concepts and knowledge from the research portfolio and identify emerging areas of research and scientific opportunity.
- Involves the electronic integration and analysis of data from NIH research portfolios and other sources.
- Move away from manual analysis to using information technology to generate a preliminary analysis of NIH's scientific portfolio.
- Provide an instantaneous read of where science has been, is now, and might be headed.

DPCPSI also coordinates trans-NIH research through the Offices of AIDS Research (OAR); Behavioral and Social Sciences Research (OBSSR); Research on Women's Health (ORWH); and Disease Prevention (ODP), which includes the Offices of Medical Applications of Research, Rare Diseases Research, and Dietary Supplements.

After briefly reviewing the missions of each of these Offices, Dr. Anderson described the fifth DPCPSI Office, the Office of Strategic Coordination (OSC), which manages the Common Fund and works with NIH staff, NIH leadership, and the broader community of stakeholders to identify emerging scientific opportunities and priorities. This Office assesses budget distribution, carries out sustained efforts to stimulate and coordinate research across ICs, and serves a catalytic role to address specific challenges and accelerate IC-funded work. Approximately one-third of the Common Fund supports investigator-initiated High Risk-High Reward (HRHR) research, whereas other Common Fund initiatives use a planned approach to address roadblocks in scientific research.

Dr. Anderson concluded his presentation by highlighting 6-month goals. He emphasized his desire to listen and as a newcomer to NIH noted the commitment of NIH professionals to achieving NIH's mission of improving public health. He also noted goals to review and refine the process for identifying Common Fund projects, working with DPCPSI Offices to ensure and enhance trans-NIH engagement and impact, and further defining what is needed from information technology to facilitate portfolio analysis. Dr. Anderson also introduced a diagram illustrating the life cycle of a Common Fund

program, from identifying an idea to deciding how it will be supported at the end of 5 years.

Discussion Highlights

- The mission of DPCPSI aligns with that of the National Institute of General Medical Sciences (NIGMS), although the programs DPCPSI supports are larger in scope and also focus more on clinical and translational research.
- The Common Fund also supports efforts in global health. Two initiatives focused on global health are in the planning stages, and DPCPSI has contributed to partnerships with the Fogarty International Center.

IV. FEEDBACK TO THE COUNCIL ON ACTIONS FROM PAST COMMON FUND DISCUSSIONS

Dr. Elizabeth Wilder, OSC Deputy Director, discussed the types and evolving nature of Council feedback with respect to the Common Fund. To date, the Council has contributed to big-picture brainstorming, reviewed Common Fund program concepts, and assisted in the strategic management of ongoing programs. Thus, Council input is sought throughout the life cycle of a Common Fund program. Dr. Wilder noted that the Council, as an advisory council for the Common Fund, provides input that transcends all programs and helps direct an overall vision for how the Common Fund is used.

Dr. Wilder emphasized the importance of the Council's input remaining at a high level to avoid potential conflicts of interest during concept clearance. The Council has provided such input, for example, when calling for NIH to encourage innovation by increasing researcher access to rich, high-density data sets. Common Fund-supported initiatives such as the Epigenomics Program, the Human Microbiome Program, and the Library of Integrated Network-based Cellular Signatures have been developed in response to this recommendation. With funding from the American Recovery and Reinvestment Act (ARRA), and in response to Council recommendations to address the scientific workforce pipeline at earlier stages, DPCPSI implemented a Summer Research program to allow high school teachers, high school students, and undergraduates to gain research experience. Upon further feedback from the Council regarding the inability to determine the impact of this program, DPCPSI decided not to pursue this program in its proposed form. A trans-NIH task force, led by NIGMS, will consider a number of possible approaches to lure the best and brightest young investigators into scientific careers. If their recommendations include programs that could be effectively piloted through the Common Fund, such programs may be considered for future support.

The Council of Councils has been reviewing program concepts since November 2008, when it approved three concepts that were still in the planning stages. For example, the Council embraced the Clinical Impact Award concept, which is being further considered for possible incorporation into the Cures Acceleration Network (CAN), a new NIH entity authorized by Congress to dramatically advance the development of new treatments and cures by reducing barriers between laboratory discoveries and clinical trials. Since 2008

the process for concept clearance has evolved such that the Council now sees concepts when they have been fully developed. The Council also has approved the following three concepts in line with overall priorities set by Dr. Francis Collins, NIH Director:

- The Health Maintenance Organization (HMO) Collaboratory program to leverage HMO network resources to facilitate large epidemiological studies and comparative effectiveness research (CER) across NIH.
- A health economics concept to assess how health care is delivered, how components in the health care system interact, how behaviors can be modified to make health care delivery more efficient, and the economics of prevention.
- An NIH Fellows program concept to aid exceptional graduate students in bypassing postdoctoral fellowships to independent research. The NIH Director's Early Independence Award (EIA) will be a pilot program that requires investigators to develop a research plan and intended host institutions to demonstrate a significant level of support in terms of laboratory space, mentoring, and access to shared resources.

As a FY 2011 initiative, EIA will be the second Common Fund program for which the Council provides second-level review. The first is the T-R01 Program, which is designed to support original HRHR research and allow researchers to apply for whatever support is needed to carry out a project with a transformative impact.

Strategic management is the third area where the Council of Councils has provided input. DPCPSI engages program staff from multiple ICs to participate in the management of Common Fund initiatives, but the Division also seeks input from the Council through briefings. For example, the Council has called for improved metrics in the Interdisciplinary Research Program and expressed concern about the lack of a clear plan for transitioning the Molecular Libraries and Imaging Program out of the Common Fund.

Discussion Highlights

- The business model, metrics, and plans for transition vary by Common Fund initiative.
- Transitioning Common Fund programs can mean finding another agency to assume funding (for example, for a program like the Molecular Libraries and Imaging Program, which creates a new type of infrastructure), promoting the uptake of Common Fund-supported tools and methodologies by the broader scientific community, or creating a new field in which investigators can apply for funding from other sources.
- Planning for Common Fund initiatives assumes they will be funded for 5 years, and sometimes 10. Dr. Collins, NIH Director, has shown a commitment to launch Common Fund programs and a willingness to adjust programs as needed.

- EIA investigator applicants must apply within 12 months of receiving their M.D. or Ph.D. M.D.s may apply within the year following the end of their clinical residencies, as long as their residencies have not served as a research training period. The EIA also has been modeled on successful institutional programs with similar objectives.
- The summer research program was initially supported by ARRA funds, but a redesigned program may be considered for future support by the Common Fund. In considering new programs to diversify the workforce and attract young people to science, NIH can learn from the National Science Foundation, which operates similar programs, and from the literature informing evaluation measures that assess not only efficacy but continuous redesign.
- Common Fund-supported health economics initiatives share some overlapping objectives with NIH efforts in CER, but the CF projects will not support CER research per se. The programs are administered separately.
- Planning activities for the health economics initiatives involve other Federal agencies such as the Agency for Healthcare Research and Quality, as well as ICs with expertise in these areas. During concept clearance and strategic management, the Council of Councils has the opportunity to discuss the integration of DPCPSI and other Federal agencies. DPCPSI also relies on program staff with the relevant expertise to recommend agencies that should be included.
- With programs such as the T-R01, DPCPSI is promoting paradigm shifts throughout NIH. To maintain interest and excitement in this program, however, DPCPSI should find ways to provide unsuccessful applicants with more detailed feedback.
- The Molecular Libraries and Imaging Program has a much broader goal than the Therapeutics for Rare and Neglected Diseases Program, which has a separate budget and is focused more on medicinal chemistry.
- DPCPSI is engaging external epidemiologists and other agencies to refine its goals and metrics for the HMO Collaboratory program.

V. THE LIFE CYCLE OF COMMON FUND PROGRAMS

Dr. Wilder described each phase in the life cycle of Common Fund programs in more detail. She also noted that there is an abbreviated period of external input for each program, although who is invited to provide this input might vary depending on program specifics.

During the strategic planning phase, OSC identifies needs, opportunities, and potential programs, using a process distinct from other Offices within DPCPSI. Once an area is identified, however, OSC uses a process similar to that used by the other Offices and ICs. Concepts are refined, initiatives developed, and concepts eventually brought to the Council for clearance.

Once a program concept is cleared, the implementation phase begins. Common Fund programs are implemented and managed by teams of staff from multiple ICs. Approvals for Funding Opportunity Announcements come from DPCPSI leadership, and the Council provides second-level review of applications for the T-R01 and EIA programs. The program is then launched and awards made. Management of the program is a fluid process in which DPCPSI receives input from IC and external staff and might change the emphasis and management. Some changes might result in a return to the strategic planning phase, at which time the Council might be asked to provide more input and clear concepts again. DPCPSI continues to seek input for the life of the program.

DPCPSI begins to think about transition of a Common Fund program midway through the 5-year implementation phase, when the Division and NIH leadership consider whether a program should continue to receive support from the Common Fund. They obtain information and engage external scientists to determine whether a program is meeting its objectives. If a program is not meeting its objectives, DPCPSI considers whether the program should end or continue to receive support from the Common Fund. If a program will receive a second phase of Common Fund support, then it once again undergoes strategic planning and concept clearance. If a program will no longer receive Common Fund support, IC Directors and the NIH leadership determine how best to continue funding or export significant achievements.

The Division conducts outreach to make external scientists, IC Directors, and other stakeholders aware of program achievements such as tools, technologies, or databases. However, Dr. Wilder noted that more work is needed. At present the Division relies on the efforts of individual investigators to make the public aware of program achievements. DPCPSI aims for a greater outreach program to make the scientific community aware of the catalytic work supported by the Common Fund.

Discussion Highlights

- DPCPSI should continue to consider how best to balance the Common Fund portfolio while staying flexible. Particularly at a time when several Common Fund projects are reaching the transition phase, DPCPSI should start considering standard approaches to stay balanced and get the most out of the Common Fund budget.
- Every Common Fund program has a plan regarding costs of implementation, but this plan varies by program. Often the Common Fund alone supports implementation, but in some cases, if a project has a specific disease focus, the Common Fund might share costs with the appropriate IC.
- To ensure flexibility, the Common Fund is not required to set aside a percentage of its budget to mechanisms focused on small business, such as the Small Business Innovation Research (SBIR) program. However, industry and small business are eligible for the majority of Common Fund programs.
- T-R01 and other HRHR research programs represent a third of the Common Fund budget and are considered separately. DPCPSI does not plan to discontinue funding

for these programs. For other programs, trans-NIH program management is critical for decision making about transition or exportation. DPCPSI engages all interested ICs and continually apprises them of program goals, processes, and obstacles, such that the ICs understand the programs' value.

- In some cases, Common Fund programs can have a large impact without additional cost by being translated into processes used throughout NIH. For example, with the training component of the Interdisciplinary Research Program, the Common Fund supported the piloting of new ways to support training. Although specific projects did not continue, the new training mechanism itself is now used by other ICs to support interdisciplinary research.

VI. CLOSED SESSION—DR. JAMES M. ANDERSON, M.D., Ph.D.

This portion of the meeting was closed to the public in accordance with the provisions set forth in Sections 552b(c)(4), 552b(c)(6), Title 5 U.S. code, and 10(d) of the Federal Advisory Committee Act, as amended (5 U.S.C. appendix 2).

Members were instructed to exit the room if they deemed that their participation in the deliberation of any matter before the Council would be a real conflict or that it would represent the appearance of a conflict.

The vote for concurrence of restorations to one grant budget at the staff recommended levels was passed by a vote of 7 approvals, 3, rejections, and 2 abstentions. During the closed session of the meeting, a total of one application was reviewed requesting additional support of \$2,732,586.

VII. COUNCIL INPUT TO COMMON FUND STRATEGIC PLANNING AND COORDINATION

After reviewing the strategic planning process, Dr. Wilder focused on the evolution of this process since 2002. She reminded the Council that strategic planning is a two-stage process: Stage 1 involves the identification of needs and opportunities, whereas Stage 2 involves the refinement of program topics into specific initiatives. Her presentation and the bulk of discussion focused on Stage 1.

In 2002, the first Roadmap strategic planning process consisted of five meetings to gather external input from senior principal investigators (PIs), junior PIs, public representatives, and industry. IC Directors and staff participated in these meetings, then sifted through ideas to select which ones to take forward. Working groups were convened to develop specific proposals, which were then prioritized by the NIH Director, IC Directors, and the working groups. Dr. Elias Zerhouni, who was then NIH Director, chose nine proposals to implement.

A similar process was undertaken in 2006, with greater representation in the meetings from public representatives and junior PIs. This effort, along with a request for information and input from IC Directors and staff, yielded 300 ideas for Common Fund

projects. A committee pre-reviewed ideas and assessed whether they were transformative, cross-cutting, and something no other entity could do. IC Directors then voted on ideas most responsive to these criteria, working groups developed proposals, and the NIH Director reviewed them. From this process two programs were selected. In addition, the New Innovator Program was implemented. Other ideas from the 2006 process were reconsidered again by the NIH leadership in 2007–2008, resulting in the selection of one proposal and the initiation of the T-R01 program.

DPCPSI asked for broad input again in 2008, but this was a bottom-up process with a lower-level NIH leadership presence. Concepts were cleared by the Council in 2008, but were placed on hold pending the arrival of a new NIH Director. In 2009, Dr. Collins arrived with priority areas and convened a panel of IC Directors, who selected Common Fund areas for further development in line with these priorities. The working groups went on to develop specific proposals, which were presented in 2010 and are now in the implementation phase.

Another process for gathering input about new areas of importance began in May 2010. This process involved one meeting with more representation from non-scientific participants, companies, and junior PIs. DPCPSI also fostered conversations about translation, high-throughput technologies, and ways to inform health care reform, all priorities set by Dr. Collins. Separate conversations were held among IC Directors. From this process, three areas were selected for further refinement.

Although the 2002 process worked well and appeared to identify several important areas, it was not transparent, and individuals outside NIH did not understand how decisions were made. DPCPSI also received feedback that the initial group of people providing input was too narrow. However, during the 2006 process, the public request for information was not useful, as it did not yield many focused ideas of the appropriate breadth, despite DPCPSI's efforts to define criteria. DPCPSI also learned from the 2006 process about the need to involve the NIH Director early on. In addition, DPCPSI learned that the number of ideas collected should be manageable and that clustering or filtering ideas could strengthen some ideas but result in the loss of other important ideas or details. The focused conversations held in 2010 allowed for more structure yet still fostered diverse input. However, obtaining external input continues to present a challenge.

Discussion Highlights

- The number of initiatives selected in a year varies depending on funding and the scope of proposed programs.
- In developing and implementing Common Fund projects, DPCPSI must identify ideas that are broad but specific enough to measure, and ambitious but limited by time constraints.
- DPCPSI is working on a metric to better clarify what will be achieved by a program by the end of its Common Fund support that would not have been achieved by the overall NIH budget. Council members suggested that such a metric assess, for

example, whether a program resulted in a large step forward that could not have been taken by a single IC.

- The Common Fund does not focus on any particular unmet medical need, but it can support initiatives that focus more on scientific opportunity across unmet medical needs. Fibrosis and degenerative diseases are examples. Burden of unmet needs might be a cross-cutting theme that can be addressed by Common Fund initiatives.
- To date few Common fund programs have ended; major turnover will begin in late 2012. The percentage of the total budget freed up by attrition is not yet known, but is expected to vary from year to year.
- Evaluations of Common Fund programs are done individually; it is difficult to evaluate the entire Common Fund. DPCPSI has launched several evaluations of the process by which programs are selected, and it anticipates evaluating outcomes, in terms of scientific impact and benefit, once each program ends.
- DPCPSI monitors ideas that have been addressed by specific ICs and assesses whether the ideas were addressed adequately or only in an IC-specific manner. Because the topics are so broad, individual ICs might invest in one component of them. However, the Common Fund supports initiatives that are trans-NIH.
- The process for obtaining input includes several variables: the type of people involved (i.e., public representative, junior PI, senior PI), how wide a net to cast as far as number of ideas, and duration of discussion times with external panels. DPCPSI is exploring whether standard workshops are the best approach to getting ideas or whether other creative approaches should be taken.

VIII. SCIENTIFIC PRESENTATION—COMMON FUND NANOMEDICINE PROGRAM

A. Overview

Nanoscience, defined as research and development at atomic, molecular, and macromolecular levels of 1 to 100 nm, began to garner national interest in the late 1990s and early 2000s. This interest was illustrated in part by the funding of the National Nanotechnology Initiative. NIH has long had an interest in and used traditional mechanisms to support nanotechnology and its applications in disease detection, tissue engineering, therapeutic delivery, and research tools.

The NIH Nanomedicine Roadmap Initiative (Nanomedicine Program) was one of the first initiatives funded by the Common Fund. This program takes advantage of what NIH does best—its knowledge about the biology and pathophysiology of disease—by focusing on multidisciplinary teams and the translation of basic science discoveries into medical applications. The program aims to gain further understanding of disease biology at an intracellular systems level, engage engineers with expertise in nanotechnology, and

ultimately work toward disease intervention. Dr. Paul Sieving, Director of the National Eye Institute, provided an overview of this initiative and its development.

Steps toward implementation of this initiative began in 2003. Although the implementation committee understood that this initiative would involve HRHR research, it also understood that it would be the researchers doing the work who would take the risk. The committee thus solicited ideas from the global research community and asked researchers what they would want to take risks on. This solicitation yielded 80 ideas, which the committee considered and whittled down to 20. The Initiative then issued 6-month planning awards to groups to flesh out these ideas; from those, four ideas were funded further. Dr. Sieving acknowledged that the mechanism for reviewing ideas was somewhat unconventional, as it required teams to share their ideas publicly, in front of their competitors. Expectations were clearly described: teams and centers were expected to have an application to test in an animal model within 5 years, and they were expected to engage physicians to discuss how such an application could be used in medicine. The Nanomedicine Program also employed the Flexible Research Authority, which was established by the Labor/HHS Appropriations Act and Conference Report to allow transactions beyond grants, cooperative agreements, and contracts and to allow NIH to make rapid adjustments as needed.

Four Nanomedicine Development Centers were funded in 2005, and an additional four were funded the following year. These 8 centers comprised 33 participating institutions, 12 states, and 6 countries, resulting in large collections of scientists working across several disciplines. NIH funding of the Program was scaled up in 2008, a program review was held in 2009, and a mid-course review was held in 2010. As a result of the mid-course review, four of the eight centers were cut because they were not developing as expected. For example one was not moving toward translation, and another found itself concentrating more on basic biology than on nanomedicine. However, the review also noted that the Nanomedicine Program is transformational, synergizing multiple disciplines, and supporting high-quality science, and the Initiative was funded for an additional 5 years. The Nanomedicine Development Centers have yielded a large number of publications in high-quality journals, but the ultimate validity of the Nanomedicine program will depend on its delivery of something applicable to medicine.

Dr. Sieving closed by presenting a timeline for transitioning the program, which will end in 2014. Resource leveraging currently provides about 25% of running costs, and around 2012, the Initiative oversight committee expects to work with the Centers to determine what might be marketable to ICs and pave the way for transition into the appropriate ICs. Clinical consultants will be involved.

Discussion Highlights

- The decision to reduce the number of Nanomedicine Development Centers was made by an oversight working group through an all-hands review, with NIH members coming to consensus to make the final decision.

- The initial planning groups were required to present their ideas in front of each other. However, the ideas presented were so complex that no one PI or small group could do it, so concerns about being scooped were minimized.
- NIH should consider ways to work with the National Science Foundation, the Department of Energy, the Department of Defense, and industry to create or enhance a pipeline of innovation, with feeding of ideas at one end and uptake by industry or other entities at the other, and make sure it continues.
- The Nanomedicine Development Centers were developed before the reorganization of the CTSA's and operate at a different risk level.
- The Nanomedicine Program involved a large amount of interaction between program staff and center personnel to make expectations clear and provide feedback. Planning groups that did not receive additional awards have noted that the planning process highlighted new learning, new connections, and new research directions, and these groups are identifying other sources of funding.

B. Nanomedicine Development Center for the Optical Control of Biological Function

Dr. Ehud Isacoff, Professor of Neurobiology at the University of California at Berkeley, presented work done by the Nanomedicine Development Center for the Optical Control of Biological Function. This Center began with a group of biologists and one chemist with an interest in employing opportunities afforded by sequencing of the human genome to remotely control function of specific signaling proteins for physiological and biochemical studies of the basic signaling circuits in cells and tissues. Although this group was not successful when it first applied to participate in the Common Fund Nanomedicine Program, it received a large amount of guidance from program staff, which enabled the group to sharpen its focus and point toward clinical aims.

This Center has developed photoswitches and genetic delivery methods to employ light rapidly to activate or inactivate proteins to restore vision. Center researchers have tested this approach *in vivo* in fish and in mice and have engaged engineers, biologists, and clinicians to develop systems to extend this work into higher mammalian models such as macaques and dogs. They are also exploring three strategies for sensitizing neurons to light for visual restoration: one based exclusively on gene delivery; one exclusively on the introduction of photo-sensitive chemicals that attach to and control native proteins in the target neurons; and a third, hybrid approach that combines the introduction of a gene to specific target neurons with a photoswitching chemical that selectively attaches to and controls only that protein in those cells. Preliminary results suggest that each of these approaches is capable of restoring vision. The group is exploring the relative efficacy of the three strategies and the aspects that increase the probability of FDA approval.

Dr. Isacoff pointed out that the Center, like the overall program, has engaged in culling to make sure it stays focused. Researchers working on science that is good, but difficult to translate to the clinic are cut and other researchers with expertise in the animal models or

clinical application added. Dr. Isacoff also noted that a fundamental success of the initiative is that the Center has been enabled to combine its push of its clinical components and work toward more advanced models for human blindness with continued support of the basic science components of the effort. As a result, the Center has found that methods it developed to target blindness can also be used in other areas such as pain. The Center is now working on further development at the physical, chemical, and biological levels to improve its photoswitches and their delivery.

Discussion Highlights

- The Center has started to talk with small industry to explore ways to translate these ideas into medical applications. Although the Center has been successful in interacting with physicians, it needs some guidance in interacting with industry.
- NIH can also use this initiative as an opportunity to talk with other Federal agencies and leverage venture capital.
- As part of the transition plan, the oversight committee for the Nanomedicine Program will talk with ICs, who are more familiar with the companies working in their diseases of interest.
- The oversight committee is also considering the Foundation for NIH as a potential partner.

IX. CLOSING REMARKS

Dr. Anderson briefly summarized the meeting, noting the Division's intent to review its functions and the Council's contributions to them, particularly with respect to the Common Fund. He also noted themes of the day's discussions:

- Unlike most grant programs, each Common Fund program specifies the expected level of program management and its expectations for the transformative nature of the science funded.
- It was suggested that DPCPSI should identify a business model for each program during the planning stages. This model should describe what is feasible over 5 or 10 years, the metrics that will define success, and mechanisms for transitioning the program out of the Common Fund.
- The Division is still investigating ways to measure success for each program.


Dr. Anderson concluded by reminding the Council that its process for program development is evolving and by expressing appreciation for the Council's efforts.

X. ADJOURNMENT

Dr. Anderson adjourned the meeting at 3:00 p.m. on November 8, 2010.


XI. CERTIFICATION

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



James M. Anderson, M.D., Ph.D.
Chair, NIH Council of Councils
Director, DPCPSI
Office of the Director
National Institutes of Health

12-16-2010
(Date)



Robin I. Kawazoe
Executive Secretary, NIH Council of Councils
Deputy Director, DPCPSI
Office of the Director
National Institutes of Health

12/15/2010
(Date)