DEPARTMENT OF HEALTH AND HUMAN SERVICES
NATIONAL INSTITUTES OF HEALTH
NATIONAL CANCER INSTITUTE

4th Virtual Meeting
of the
BOARD OF SCIENTIFIC ADVISORS

Summary of Meeting

May 12, 2020

Virtual Meeting
National Cancer Institute
National Institutes of Health
Bethesda, Maryland

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
NATIONAL INSTITUTES OF HEALTH
NATIONAL CANCER INSTITUTE

BOARD OF SCIENTIFIC ADVISORS

SUMMARY OF MEETING
12 May 2020

The Board of Scientific Advisors (BSA), National Cancer Institute (NCI), convened for its 4th virtual regular meeting on Tuesday, 12 May 2020, at 11:00 a.m. BSA members and NCI staff attended virtually. Dr. Dafna Bar-Sagi, Saul J. Farber Professor, Vice Dean for Science, Senior Vice President and Chief Scientific Officer, Professor, Department of Biochemistry and Molecular Pharmacology and Medicine, New York University (NYU) Langone Health, NYU School of Medicine, presided as Chair. The meeting was open to the public from 11:00 a.m. until 5:30 p.m. for the consideration of new requests for applications (RFAs), Cooperative Agreements (Coop. Agr.), requests for proposals (RFPs), and program announcements with special receipt, referral, and/or review (PARs) of new and re-issue concepts presented by NCI Program staff.

BSA Board Members Present:

Dr. Dafna Bar-Sagi (Chair)
Dr. Kenneth C. Anderson
Dr. Michael John Becich
Dr. Mary C. Beckerle
Dr. Melissa L. Bondy
Dr. Otis W. Brawley
Dr. Graham A. Colditz
Dr. Christopher M. Counter
Dr. Carol E. Ferrans
Dr. Keith T. Flaherty
Dr. Karen E. Knudsen
Dr. James V. Lacey, Jr.
Dr. Michelle M. Le Beau

Dr. Sylvia Katina Plevritis
Dr. W. Kimryn Rathmell
Dr. Leslie L. Robison
Dr. Martine F. Roussel
Dr. Robert D. Schreiber
Dr. Victoria L. Seewaldt
Dr. Kevin M. Shannon
Dr. David Sidransky
Dr. Ian M. Thompson, Jr.
Dr. David A. Tuveson
Dr. Robert H. Vonderheide
Dr. Eileen P. White
Dr. Cheryl L. Willman

Others Present: Members of NCI's Scientific Program Leadership Committee, NCI staff, members of the extramural community, and press representatives.

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I. CALL TO ORDER AND OPENING REMARKS—DR. DAFNA BAR-SAGI

Dr. Dafna Bar-Sagi called to order the 4th virtual meeting of the Board of Scientific Advisors (BSA or Board) and welcomed current members of the Board, National Institutes of Health (NIH) and National Cancer Institute (NCI) staff, guests, and members of the public. Dr. Bar-Sagi reminded Board members of the conflict-of-interest guidelines and confidentiality requirements. Members of the public were invited to submit to Dr. Paulette S. Gray, Director, Division of Extramural Activities (DEA), in writing and within 10 days, comments regarding items discussed during the meeting. Dr. Bar-Sagi called attention to future meeting dates listed on the agenda.

II. NCI DIRECTOR'S REPORT—DR. NORMAN E. SHARPLESS

Dr. Norman E. Sharpless, Director, NCI, welcomed BSA members and attendees to the 4th virtual meeting of the BSA and provided an update on the NCI's activities, COVID-19 activities, and cancer research progress. Dr. Sharpless noted that this meeting was rescheduled from the 30 March 2020 BSA meeting. Despite the increased activities in response to the COVID-19 pandemic, Members were assured that the NCI's primary focus remains cancer research and care provided to patients by the NCI-Designated Cancer Centers (Cancer Centers). He also gave an update on the NCI's COVID-19 response, NCI routine business, and progress in cancer research was .

COVID-19 Response. Dr. Sharpless highlighted three reasons why the NCI is important for responding to a pandemic such as COVID-19. First, people with cancer and cancer survivors are disproportionately affected and are vulnerable to poor outcomes from the SARS-CoV-2 infection. Second, the history of research expertise and capacity across the NCI and the Frederick National Laboratory for Cancer Research (FNLCR) is reflected in the NCI's decades of leadership in virology, intramural and extramural research infrastructure, and collaborations and convening power. Third, the NCI has a duty to contribute to addressing a global public health crisis.

Dr. Sharpless remarked on the interruptions in cancer care delivery as a result of the pandemic. The reports from extramural investigators about the decrease in screening and deferred care have been unsettling. Cancer research data from previous years of delaying diagnosis and therapy clearly demonstrate that this leads to worse outcomes for patients with cancer, indicating that the approaches to prevent, diagnose, and treat cancer work and must not be delayed. For decades, theAnnual Report to the Nation on the Status of Cancer, a collaborative effort between the NCI, Centers for Disease Control and Prevention (CDC), American Cancer Society, and the North American Association of Central Cancer Registries, has shown decreases in cancer mortalities, but that progress is predicted to be significantly affected if cancer care is further delayed. These delays in care likely will be reflected in the upcoming 2021, 2022, and even 2023 annual reports. There has not been an increase in cancer mortality since 1993. Neglecting cancer care will produce a negative impact for decades. In light of these delays, the NCI issued four new COVID-19 funding opportunity announcements (FOAs) that include competitive revisions and administrative supplements to existing grants.

Members were informed that the NCI's work related to SARS-CoV-2 serology testing at the FNLCR is progressing and gaining the attention of others in the research community. He noted that the recent U.S. Food and Drug Administration (FDA) revised guidance on COVID-19 testing, *Policy for Coronavirus Disease-2019 Tests During the Public Health Emergency: Immediately in Effect Guidance for Clinical Laboratories, Commercial Manufacturers, and Food and Drug Administration Staff, was i*ssued on 4 May 2020. With this revision, the FDA enforces serology tests to be marketed within 10 days submission of an Emergency Use Authorization (EUA), a reflection of the confidence in specific manufacturers, available tests, and validations. The FNLCR is leading the validation efforts for the FDA.

Dr. Sharpless noted that Congress appreciates NCI's capabilities at the FNLCR, world-class expertise in virology, and extensive clinical research networks. Collectively, these attributes reveal that the NCI is well positioned to lead a much needed serology research effort.

He reminded BSA members that Congress approved four aid packages to address COVID-19 to support small businesses and the economy and preserve such critical operations as health care. The fourth supplement, the Paycheck Protection Program and Healthcare Enhancement Act, was signed into law on 24 April 2020 and includes a $306 million (M) appropriation for the NCI to develop, validate, improve, and implement serological testing and associated technologies. The NCI is working closely with the National Institute of Allergy and Infectious Diseases (NIAID) in planning research areas best suited to use these funds for the benefit of the public. He explained that the COVID-19 funding is separate from the NCI's regular appropriations and does not shift the NCI's priority from cancer. The NCI envisions three areas of spending for the COVID-19 appropriation: serology and immunology capacity building, clinical serological sciences, and foundational serological sciences.

NCI Ongoing Activities. Dr. Sharpless informed the BSA members that Congress has been focused on the supplemental funding related to the COVID-19 pandemic, and the work on the fiscal year (FY) 2021 budget has been delayed. After the fifth emergency appropriations bill is completed, the appropriators likely will resume work on the regular FY 2021 appropriations bill.

In an update of the Childhood Cancer Data Initiative (CCDI), members were informed that Dr. Jamie Guidry Auvil, Director, Office of Data Sharing, Center for Biomedical Informatics and Information Technology, and Executive Secretary, convened the BSA *ad hoc* Working Group in Support of the CCDI on 27 March 2020 and discussed the CCDI and its relationship to ongoing NCI pediatric cancer activities. The Working Group will present its report at the 15 June 2020 Joint BSA/NCAB meeting. BSA members were reminded that the NCI is using the FY 2020 CCDI appropriation to support the foundational aspects of childhood cancer research and data sharing.

He also announced that the vector-production facility soon will open at the FNLCR and will evaluate potential viral production projects proposed by the extramural community. The NCI will be accepting applications this summer.

Dr. Sharpless called attention to an area that the NCI has been closely monitoring: An increasing number of men over age 70 are presenting with metastatic lethal prostate cancer. Despite improvements in treatment, imaging, and biopsies, the mortality rates remain unchanged. The NCI hosted an internal meeting to discuss the prostate cancer research portfolio and is planning a workshop with the extramural community to evaluate this phenomenon and develop strategies to address the problem.

Dr. Sharpless announced that Dr. Philip E. Castle is now Director, Division of Cancer Prevention (DCP). He expressed appreciation to Dr. Deborah M. Winn, who served as Acting Director for the past year.

Progress in Cancer Research. Dr. Sharpless highlighted recent progress in cancer research made by both intramural and extramural research programs. Dr. David G. DeNardo and his laboratory at Washington University School of Medicine in St. Louis reported on dendritic cells and immunotherapies. Dr. DeNardo's findings suggest that the number of dendritic cells present in a tumor could explain the differential response of some cancers to immunotherapy. Dr. Richard N. Kitsis and his team at the Albert Einstein College of Medicine developed an experimental drug to prevent chemotherapy-induced heart toxicity without interfering with the therapeutic aspects. Dr. Macel van den Brink and his laboratory at Memorial Sloan Kettering Cancer Center discovered that in people with hematopoietic malignancies, the health of their gut biome affects the risks of not surviving allogeneic stem cell transplant.

In the discussion, the following points were made:

- NCI consideration should be given to hosting a special session during the 2021 American Society of Clinical Oncology (ASCO) Gastrointestinal Cancers Symposium to highlight the fact that despite the improvements in treatment, imaging, and biopsies, the metastatic prostate cancer mortality rates mostly have remained unchanged.
- The NCI should also explore options to partner with the ASCO on the messaging of this issue to the cancer community.

III.   RFA/COOP. AGR./RFP and PAR CONCEPTS—NEW AND RE-ISSUE—NCI PROGRAM STAFF

Division of Cancer Treatment and Diagnosis

Glioblastoma Therapeutics Network (New RFA)—Dr. Suzanne L. Forry

Dr. Suzanne L. Forry, Program Director, Preclinical Therapeutics Grants Branch, Division of Cancer Treatment and Diagnosis (DCTD), presented a new concept to establish the NCI Glioblastoma Therapeutics Network (GTN). Glioblastoma multiforme (GBM) is a difficult cancer, for which effective treatments are limited. In fact, 13,000 new cases of GBM are diagnosed in the United States annually, and even with the standard treatment options (e.g., surgery, radiation, chemotherapy), patients survive, on average, 15 months after diagnosis. Dr. Forry described the pathophysiological challenges in developing effective GBM therapies, such as the difficulty of adequately resecting the cancer and delivering sufficient radiation therapies without neurological compromise. In addition, the blood-brain barrier, genomic heterogeneity, and immunosuppressive microenvironment all limit effective treatments.

Given that therapeutic success for GBM is rare, several stakeholders convened meetings on this topic, in which participants agreed on the urgent need to improve preclinical and early clinical qualification of agents to enable successful Phase III GBM clinical trials. Furthermore, the NCI Clinical Trials and Translational Research Advisory Committee (CTAC) established a GBM Working Group of the Translational Research Strategy Subcommittee (TRSS) to identify critical research gaps and define opportunities to improve therapy. The Working Group recommended establishing a national infrastructure to enhance support for discovery and development of GBM therapies, with five areas of research capability: (1) preclinical qualification of new agents; (2) clinical trials driven by molecular pharmacodynamics (PD) and imaging; (3) immunotherapy; (4) improving radiation therapy efficacy; and (5) improving the quality of life of patients.

The purpose of this RFA is to improve the treatment of adult GBM by developing novel effective agents and testing them in the clinic, which aligns with the TRSS GBM Working Group's recommendations. The research will focus on late drug discovery through Phase I clinical trials involving preclinical testing in GBM animal models and early-phase proof-of-mechanism clinical trials. The RFA will support establishing a national GTN consisting of up to five crosscutting research teams and a GTN Coordination Center using the U19 mechanism. A GTN Steering Committee composed of representatives from each U19 team, NCI staff, NCI-funded GBM investigators, and National Institute of Neurological Disorders and Stroke staff will oversee the operations.

Subcommittee Review. Dr. Martine F. Roussel, St. Jude Children's Research Endowed Chair in Molecular Oncogenesis, Full Professor, Department of Molecular Sciences, The University of Tennessee, Full Member, Department of Tumor Cell Biology, St. Jude Children's Research Hospital, expressed the Subcommittee's enthusiasm and support for the concept, noting the lack of progress in GBM treatment in the past 30 years. Dr. Roussel conveyed the Subcommittee's suggestion on using single-cell or RNA sequencing before and after treatment to assist in identifying biomarkers of residual disease. The

Subcommittee appreciates NCI staff responses to the members' questions about testing agents in combination with targeted agents, immunotherapy, or standard of care and considering industry partners and contracts.

In the discussion, the following points were made:

- The GTN Coordination Center will manage scientific and administrative activities, which include clinical trial participation across the U19 teams.

- Program staff clarified that the Specialized Programs of Research Excellence (SPOREs) can bring any agents that the groups are not further developing for the clinic into the GTN, and SPORE investigators not participating in a U19 team can serve on the GTN steering committee.

- Although other NCI programs and networks, such as the NCI Experimental Therapeutics (NExT) program and NCI Experimental Therapeutics Clinical Trials Network (ETCTN), are addressing similar challenges concerning the drug discovery gap, these efforts are disease agnostic. The GTN is an approach to bridge pharmacodynamic early clinical trials in a disease (GBM) that has not had focused attention in early-phase clinical trials.

The first year's cost for the one-time issuance is estimated at $6 M for five U19 awards, with a total cost of $30 M for 5 years.

Motion. A motion to approve the Division of Cancer Treatment and Diagnosis's new RFA entitled "Glioblastoma Therapeutics Network" was approved unanimously.

Division of Cancer Control and Population Sciences

Tobacco Cessation, HIV, and Comorbidities in Low- and Middle-Income Countries (New RFA)— Dr. Mark Parascandola

Dr. Mark Parascandola, Program Director, Tobacco Control Research Branch, Division of Cancer Control and Population Sciences (DCCPS), introduced a new concept to support research on tobacco cessation, HIV, and comorbidities in low- and middle-income countries (LMICs). Dr. Parascandola explained that the smoking prevalence is higher in people living with HIV/AIDS (PLWH) compared with the general population who do not have HIV. PLWH who smoke are more prone to be affected by morbidity and mortality, develop certain cancers and other smoking-related diseases, and have a worse response to the standard of care, antiretroviral therapy (ART). Although the introduction of ART has increased the life expectancy of PLWH worldwide and decreased the mortality from AIDS, the burden of noncommunicable diseases has increased. In fact, of the 37 million people worldwide with HIV, 23 million are on ART, most of whom (75%) are in LMICs, particularly in the sub-Saharan Africa region.

Despite the decline in tobacco use in high-income countries over the years, the burden is shifting to the LMICs, in which 84 percent of the world's 1.3 billion smokers reside. Dr. Parascandola highlighted the challenges for tobacco-use interventions. In smoking cessation interventions for PLWH, the cessation rate is low. Complications from other factors (e.g., other substance use, mental and socioeconomic status) will need to be considered, regardless of the income level of the country. The majority of the evidence for tobacco cessation originates in high-income countries, suggesting a need to adapt and integrate tailored tobacco control interventions into existing activities in LMICs. This provides researchers with opportunities to intervene by leveraging existing infrastructures for community interventions, improving diagnostic co-testing, and enabling integration of services.

The goals of this RFA are to assemble transdisciplinary teams of investigators to adapt interventions that are developed and tested in challenging or low-resource populations and test the robustness of these interventions among PLWH in LMICs. The NCI-appropriated AIDS funds, as established by the NIH Office of AIDS Research (OAR), will support this research. The NCI/DCCPS will engage other NIH Institutes and Centers (ICs) with similar tobacco cessation goals, including the National Institute Drug Abuse (NIDA), National Institute on Minority Health and Health Disparities (NIMHD), and Fogarty International Center, to participate in co-funding opportunities. The RFA will support four or more R01/U01 awards and build on the previous efforts, NCI/NIDA PARs (PAR-18-22/23, R01/R21) and NCI RFA-CA-18-027/28.

Subcommittee Review. Dr. Carol E. Ferrans, Harriet Werley Endowed Chair for Research, Professor, Department of Biobehavioral Health Sciences, College of Nursing, University of Illinois at Chicago, expressed the Subcommittee's strong enthusiasm for the concept, which by focusing on smoking cessation interventions and HIV addresses a topic well-deserving of an RFA. Dr. Ferrans emphasized that the solicitation for applications will be framed to ensure the success of the intervention if funded. Principal investigators responsive to the RFA are expected to have demonstrated success in implementing smoking cessation in low-resource areas either in the United States or in LMICs. The Subcommittee commends the NCI for its use of the U01 mechanism for this research, which is certain to address the diversity of the different populations and also provides an opportunity for rigorous testing of the interventions.

In the discussion, the following points were made:

- No specific LMIC has been selected for testing the interventions, but the NCI anticipates applicants providing this insight and also could consider expanding current initiatives in Africa and Vietnam

The first year's cost for the one-time issuance is estimated at $2.5 M for four R01/U01 awards, with a total cost of $12.5 M for 5 years.

Motion. A motion to approve the DCCPS' new RFA entitled "Tobacco Cessation, HIV, and Comorbidities in Low- and Middle-Income Countries" was approved unanimously.

Division of Cancer Biology

Aging, Cancer-Initiating Cells, and Cancer Progression (New RFA)—Dr. Margaret Klauzinska

Dr. Margaret Klauzinska, Program Director, Cancer Immunology, Hematology, and Etiology Branch, Division of Cancer Biology (DCB), presented a concept on aging, cancer-initiating cells, and cancer progression, which is a joint NCI and National Institute on Aging (NIA) effort. The United States Census Bureau projects that by the year 2035, the number of adults over age 65 will outnumber children under age 18, reflecting an aging Nation. This change in demographics will require a better understanding of the aging-associated features of medical challenges, including the higher incidence of cancer. Most cancers, regardless of complexity or tissue of origin, show similar incidence, and the majority appear after age 50. Research has shown that aging impacts adult stem cell clonal expansion in healthy adults and that the features of aging and cancer overlap, but the mechanisms are not well understood. In addition, aging-related somatic mutations in adults age 50 and older are common in other cells and tissues.

The purpose of this joint NCI-NIA RFA is to develop close scientific interactions between aging researchers and cancer researchers to help identify the aging mechanisms that promote cancer initiation. The goals are to expand the limited understanding of the age-driven mechanistic factors and cellular interactions that contribute to cancer initiation in aged cells, establish standards for assays, and develop

new or improved aging models. This research will support collaborative studies between cancer and aging researchers using the U01 mechanism

Subcommittee Review. Dr. Mary C. Beckerle, Chief Executive Officer, Huntsman Cancer Institute, Jon M. Huntsman Presidential Endowed Chair, Distinguished Professor of Biology and Oncological Services, Associate Vice President of Cancer Affairs, The University of Utah, expressed the Subcommittee's support for the concept. Dr. Beckerle noted two reasons why the Subcommittee thinks an RFA on aging and cancer initiation is timely: age is the single most significant risk factor for cancer and the world's population is aging rapidly, and emerging science is revealing several pro-carcinogenic physiological and micro-environmental changes occurring in aging tissues. In addition to the NIH Institutes and Centers, the American Association for Cancer Research and the National Academy of Sciences both have highlighted cancer and aging as an area of interest in their recent meetings. The Subcommittee is pleased about the NCI and NIA partnership, which will help to bring together diverse and multidisciplinary perspectives as well as co-funding.

In the discussion, the following point was made:

- Although an RFA on aging and cancer is an important area of research, the U01 funding mechanism may not be as productive as the R01. As such, consideration should be given to providing an update on the NIH funding mechanisms and how they are selected in support of investigator-initiated versus multi-principal investigator-driven research.

The first year's cost for the one-time issuance is estimated at $2 M for three to four U01 awards, with a total cost of $10 M for 5 years.

Motion. A motion to approve the DCB's new RFA/Cooperative Agreement (Coop. Agr.) entitled "Aging, Cancer-Initiating Cells, and Cancer Progression" was approved with 24 ayes, zero nays, and 1 abstention.

Office of the Director

Small Business Innovation Research (SBIR) Contract Topics (new RFP)—Dr. Greg Evans

Dr. Greg Evans, Program Director, SBIR Development Center, presented 12 SBIR contract topics for funding in FY 2021. SBIR and Small Business Technology Transfer Research (STTR) programs are congressionally mandated and support commercial research by small businesses. In FY 2019, the NCI allocated 11 percent of the SBIR/STTR $174 M budget to contracts. Dr. Evans explained that the NCI topics are developed once per calendar year to include in the NIH-wide SBIR contract request for proposals. The topics reflect NCI priority areas, including Cancer Moonshot[SM] topics, areas with commercial potential, and portfolio gaps. Two staff committees vetted the concepts for significance, innovation, and commercial potential and recommended 17 topics for publication. These fall into the areas of therapeutics, medical devices, diagnostics, information technology (IT), and manufacturing; Dr. Evans also highlighted that eight are aligned with the Cancer Moonshot[SM] initiative and crosscutting themes. Detailed reports have been provided in the electronic Board book.

Therapeutics Topics

Next-Generation 3-D Tissue Culture Systems with Tertiary Lymphoid Organs. Spur the development of immuno-oncology research on *in vitro* culture systems for the lymph node-like structures that form in response to chronic inflammation.

Synthetic Biology Gene Circuits for Cancer Therapy. Support the development of advanced gene therapies to deliver artificial signaling pathways that can be exploited to improve therapeutic indices

using a wide range of approaches.

Medical Devices Topics

Applicator-Compatible Electronic Brachytherapy Sources for Cancer Radiotherapy. Develop implantable electronic radiation sources that can be turned off, which would replace currently used natural radiation sources and provide advantages for safety and dosimetry.

Self-Sampling Devices for HPV Testing-Based Cervical Cancer Screening. Support user-friendly, high cellular yield devices to allow women to self-collect cervicovaginal samples for HPV testing. This would give women control over their screening, increase convenience and compliance, and decrease mortality.

Clinical Diagnostics and Molecular Analysis Topics

Quantitative Imaging Software Tools for Cancer Diagnosis and Treatment Planning. Commercialize new or existing quantitative software for use by radiologists in conjunction with current imaging modalities. Dr. Evans noted that many candidate software programs were developed through the NCI Quantitative Imaging Network.

3-D Spatial Omics for Molecular and Cellular Tumor Atlas Construction. Support the development of scalable imaging technologies for three-dimensional (3-D) tumor architecture and single-cell omics information. The fast workflows will be key to this topic.

Understanding Cancer Tumor Genomic Results: Technology Applications for Providers. Support the development of software to assist oncology providers in communicating the risks and benefits of genomic testing prior to a test and when explaining the results of a test to patients.

Single Cell 'Unbiased Discovery' Proteomic Technologies. Support proteomic biomarker discovery approaches to identify as many proteins as possible in a single cell. This will be used for biomarker discovery in the near term and for precision medicine in the long term.

Information Technology and Bioinformatics Topics

Software to Address Social Determinants of Health in Oncology Practices. Support information technology tools to create a systematic assessment of the social determinants of health for all patients in an oncology practice and to provide referral and follow-up for those patients with health barriers.

Digital Tools to Improve Health Outcomes in Pediatric Cancer Survivors. Support software products to improve the delivery of cancer survivorship care for children and adolescents.

Advanced Manufacturing to Speed Availability of Emerging Autologous Cell-Based Therapies. Improve cell processing methods to expedite and reduce the cost of producing cell-based therapies. This topic will encourage solutions that use automated parallel processing of multiple autologous cell preparations for cell-based therapies.

Manfacturing Technologies Topic

Advanced Manufacturing to Speed Availability of Emerging Autologous Cell-Based Therapies. Improve cell processing methods to expedite and reduce the cost of producing cell-based therapies. Encourage solutions focusing on automated parallel processing of multiple autologous cell preparations for cell-based therapies.

Topics for FY 2020 to be Re-issued

In addition to the 12 new topics presented, 6 topics from the previous year are proposed for re-issuance to meet the need or opportunity defined by the topic authors or the Cancer Moonshot[SM]. Dr. Evans noted that the topics would only be open for submissions for 3 months. The topic on "Quantitative Biomimetic Phantoms for Cancer Imaging and Radiation Dosimetry" includes a new radiation dosimetry aspect. The topic on "Spatial Sequencing Technologies for Single-Cell Resolution for Cancer Research and Precision Medicine" also is being republished. The remaining republication topics are under the IT area. "IT Tools for Automated Analysis of Physical Activity, Performance, and Behavior from Images for Improved Cancer Health"; a topic on "Software for Visualizing Multiscale Data"; a topic on "De-identification Software Tools for Clinical Cancer Imaging Research," which includes new clarifications; and a topic on "Cloud-Based Multi-Omic and Imaging Software for Analysis of Big Data in the NCI Cancer Research Data Commons," which includes slight changes to add imaging data as a responsive data type.

Subcommittee Review. Dr. David Sidransky, Director, Head and Neck Cancer Research, Professor of Otolaryngology–Head and Neck Surgery, Department of Otolaryngology–Head and Neck Surgery, Johns Hopkins University School of Medicine, expressed the Subcommittee's enthusiasm and strong support for the concept, which is well vetted over multiple topic areas. The Subcommittee lauded the NCI on the timeliness and innovation of the topics as well as on their coverage of the continuum from early detection to treatment, delivery of care, and survivorship.

In the discussion, the following point was made:

- The NCI could consider expanding the SBIR contract topic "Software to Address Social Determinants of Health in Oncology Practices" to include behavioral and epidemiological data on environmental exposures and patient-centered tools.

Motion. A motion to approve the Office of the Director's (OD) new RFP entitled "SBIR Contract Topics" was approved unanimously.

NCI SBIR Innovative Concept Award to Develop Transformational Solutions Focused on Prevention, Detection, Treatment, and Research in Pediatric Cancers and Rare Cancers (new RFP)—Dr. Deepa Narayanan

Dr. Deepa Narayanan, Program Director, SBIR Development Program, presented a new RFP concept to support the SBIR innovative concept award to develop transformational solutions focused on prevention, detection, and treatment in research in pediatric cancers and rare cancers. This concept of the high-risk, high-reward SBIR project in pediatric and rare cancers is different from the standard SBIR solicitations. The NCI is seeking innovative and transformative technologies with limited or no preliminary data but, not very early stage technology development proposals. This SBIR program is structured into three phases: Phase I, a proof-of-concept study, provides up to $300,000 for 6–12 months; Phase II provides $2 M over 2 years and requires both research and development and commercialization plans; and Phase III, the commercialization phase, establishes a public-private partnership using non-SBIR/STTR funds.

Because academic grants are science-based rather than product-based as are the SBIR grants, they rarely result in a product, even if the science is exemplary. The SBIR/STTR grants, although focused on product development and innovation, the high-risk projects and disruptive innovations often do not reach the SBIR program. The NCAB *ad hoc* Working Group on SBIR/STTR in its final report to the NCI recommended implementing an SBIR Concept Award. This RFP aligns with the Working Group's recommendations.

The goal of the RFP is to encourage small businesses to develop high-risk/high-impact technologies of disruptive innovation. The pre-SBIR/Phase 0 product-focused projects will address pediatric or rare cancers.

Subcommittee Review. Dr. Kevin Shannon, Professor, Department of Pediatrics, School of Medicine, University of California, San Francisco, expressed the Subcommittee's strong support for the concept. The Subcommittee appreciated NCI staff responses to their suggestions on increasing the award budget, which will attract more applications.

In the discussion, the following points were made:

- Although the initial 3-year pilot does not include STTR awards, the NCI could consider including these awards in a future solicitation.

- Program staff clarified that once companies generate preliminary data from their SBIR Concept Awards, they will enter the SBIR program at Phase I and/or the NCI Innovative Molecular Analysis Technologies (IMAT) Program. Both of these efforts will assist in building the SBIR pipeline and foster the close integration of SBIR programs across the NCI as well as the NIH.

The first year's cost for the one-time issuance is estimated at $1.5–3 M for 5 to 10 N43 awards, with a total cost of $4.5–9 M for 3 years.

Motion. A motion to approve the OD's new RFP entitled "SBIR Innovative Concept Award to Develop Transformational Solutions Focused on Prevention, Detection, Treatment, and Research in Pediatric Cancers and Rare Cancers" was approved with 24 ayes, zero nays, and 1 abstention.

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Division of Cancer Control and Population Sciences

Cancer Intervention and Surveillance Modeling Network (CISNET) Incubator Program for New Cancer Sites (New RFA/Coop. Agr.)—Dr. Eric J. Feuer

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Dr. Eric J. Feuer, Chief, Statistical Research and Applications Branch, Surveillance Research Program (SRP), DCCPS, presented an RFA concept on a CISNET incubator program for new cancer sites. CISNET is a consortium of NCI-sponsored statistical modelers of breast, prostate, colorectal, lung, esophagus, and cervical cancer sites. This consortium was established to provide a link between complex evidence and actionable public health strategies using a comparative modeling approach. Each site consists of three to six independent modeling groups. CISNET's most high-profile work has been in assisting the U.S. Preventive Services Task Force in developing screening guidelines.

The framework of CISNET population modeling is first built using common inputs (e.g., risk factors, screening behavior, and new treatments). The framework is then expanded with individual cancer simulation models (parallel lives with and without the interventions) that include groups with preclinical cancer and groups undergoing diagnosis and treatment. The final step, combining individual histories, captures the harms and benefits of an intervention.

Dr. Feuer noted that a major challenge in CISNET modeling is that the transitions between preclinical states are indirectly inferred, and not directly observed. Population modeling in cancers outside of the six established sites is limited, and the models that do exist outside of these six sites are not advanced in their development. Because funding for model development is inconsistent, most model development efforts are not continuous and focus on only a limited portion of the cancer control spectrum. Although new data resources to inform new model development are readily available, comparative modeling remains limited.

This RFA is proposing to support a CISNET incubator program to address questions that extend beyond the established six cancer sites. This program also will help to extend CISNET's current model of success to cancer sites with limited population and comparative modeling efforts. This smaller-scale incubator program will support multi-principal investigator grants consisting of one modeling group serving as the coordinating center and two to three independent modeling groups with shared data resources. Only one principal investigator applying for an incubator program grant can concurrently apply for a CISNET grant. The NCI will rely on the research community to make the case that a cancer site is amenable to CISNET modeling and that modeling that site will have a positive impact on public health.

Dr. Feuer emphasized that the NCI is seeking site-specific applications for the incubator program and will prioritize applications proposing to model feasible cancer-control opportunities where no others exist. For example, one cancer for which no comprehensive national cancer-control strategy exists is liver cancer, which will be prioritized. The incubator RFA will focus on the same nine priority areas as the main CISNET program, but with an added emphasis on model development and the optimization and refinement of strategic prevention opportunities.

Subcommittee Review. Dr. Otis W. Brawley, Bloomberg Distinguished Professor of Oncology and Epidemiology, The Sidney Kimmel Comprehensive Cancer Center, Johns Hopkins University, expressed the Subcommittee's enthusiasm and support for the concept. Dr. Brawley remarked on the success of the CISNET program as a national resource that has influenced screening guidelines for breast and lung cancer. The Subcommittee commended the NCI for its productivity in generating resources and tools through the CISNET program and thinks that the possibility of having liver cancer as a new site is compelling.

In the discussion, the following point was made:

- The CISNET program may benefit from highlighting its visualization and modeling assets in the broader research community.

The first year's cost for the one-time issuance is estimated at $4 M for four awards, with a total cost of $20 M for 5 years.

Motion. A motion to approve the DCCPS's new RFA/Coop. Agr. entitled "Cancer Intervention and Surveillance Modeling Network (CISNET) Incubator Program for New Cancer Sites" was approved unanimously.

Division of Cancer Treatment and Diagnosis

Pediatric Preclinical Testing Public-Private Partnership (PPTP3) (Re-Issue RFA/Coop. Agr.)— Dr. Malcolm A. Smith

Dr. Malcolm A. Smith, Associate Branch Chief, Pediatric Oncology Clinical Investigations Branch, Clinical Trials Evaluation Program, presented the re-issue concept of the Foundation for the National Institutes of Health (FNIH) PPTP3. Supported by the NCI and FDA, the PPTP3 group aims to increase the throughput of pediatric preclinical testing, which will help pharmaceutical companies to comply with the Research to Accelerate Cures and Equality (RACE) Act's new molecularly targeted pediatric-investigation requirement for certain oncology applications. In March 2020, the FNIH established a partnership research agenda with all interested parties, including academia, the FDA, the NCI, and pharmaceutical companies. The partnership will involve both NIH and private-sector funding.

In the PPTP3 operating model, a company can bring its agent to the partnership, have it assessed for relevance, and choose to have testing done through the partnership. If tested, any results and the

preclinical data package are used in FDA submissions. Academic research teams will be included in the *in vivo* testing program, serve on the scientific advisory committee, and provide input on prioritization and research plans. The academic laboratories will perform the testing, assist in preparing the report, and publish the results. All data generated will be publicly available.

Dr. Smith noted the accomplishments of the Pediatric Preclinical Testing Consortium. Investigators created an annotated genomic data set of somatic oncogenic regulation across 37 distinct pediatric malignancies encompassing 261 patient-derived xenograft models. Data are stored in the NIH-funded childhood cancer visualization tool, PedcBioPortal. The Consortium validated therapeutic targets for neuroblastoma and multiple pediatric solid tumors, including Ewing sarcoma, and identified several relevant agents. This re-issue RFA addresses the NCI component of the PPTP3, which includes the *in vivo* testing program and coordinating center. In this next phase, the NCI will expand the *in vivo* testing program from five to eight research teams to test 8 to 10 agents per year and broaden the use of the single-mouse trial design. In addition, a coordinating center will provide administrative management and coordinate the activities of the Consortium.

Subcommittee Review. Dr. Shannon expressed the Subcommittee's enthusiasm and support for the re-issuance concept, which is addressing the critical need for preclinical testing in pediatric cancers. The Subcommittee requested that the NCI clarify in the RFA the criteria for review and prioritization of the disease focus areas.

In the discussion, the following point was made:

- Testing 8 to 10 agents per year is doable using the subcutaneous flank tumor model, but it would likely be too ambitious for the orthotropic central nervous system models.

The first year's cost for the one-time issuance is estimated at $5.9 M for eight awards, with a total cost of $29.5 M for 5 years.

Motion. A motion to concur on the re-issuance of the DCTD's RFA/Coop. Agr. entitled "Pediatric Preclinical Testing Public-Private Partnership (PPTP3)" was approved unanimously.

Division of Cancer Biology

International Agency for Research on Cancer (IARC) Monographs Program (Re-Issue RFA/Limited Competition)—Dr. Ron Johnson

Dr. Ron Johnson, Program Director, DCB, presented a re-issue RFA for the IARCMonographs. Established in 1965 and funded by the NCI since 1982, IARC, the specialized cancer agency of the World Health Organization, facilitates international collaboration on cancer research and produces the *IARC Monographs*, which are critical scientific evaluations of carcinogenic hazards to humans. The agency also evaluates chemicals, biological agents, occupational exposures, and lifestyle factors, which are prioritized every 5 years by the IARC Advisory Group composed of senior health policy analysts and environmental researchers. In the monograph developing process, working groups of subject-matter experts (interdisciplinary and international) review the literature and determine whether an agent is a carcinogenic hazard. Dr. Johnson pointed out that the IARC convenes three working groups, two of which are funded by the NCI. *IARC Monographs* volumes are available as PDFs at no cost to the user.

To date, 125 working groups have evaluated more than 1,000 agents. Over the current award cycle, an internal evaluation group analyzed 48 publications and found a relative citation rate in the 90th percentile. An expert panel performing an external review of the program identified several strengths and made suggestions to improve the dissemination of information, which the NCI is actively addressing. Recently

evaluated agents that are of high public health concern include engine exhaust, red meat, and outdoor air pollution. Several agents of concern in low low and middle income countries (LMIC) include hepatitis B and C viruses, indoor combustion and cooking, and malaria. The IARC Advisory Group announced new and high-priority agents for 2020: bisphenol A, cytomegalovirus, electronic cigarettes and nicotine, water disinfection byproducts, and cannabis smoking. This RFA re-issuance will continue the activities of the unique IARC program, which is not duplicated elsewhere. With this renewal, the NCI is proposing to convert from a U01 to the R01 funding mechanism.

Subcommittee Review. Dr. W. Kimryn Rathmell, Cornelius A. Craig Professor, Department of Medicine, Director, Division of Hematology and Oncology, Vanderbilt University Medical Center, expressed the Subcommittee's enthusiasm and support for the re-issuance concept. The Subcommittee remarked on the unique resource of the IARC program and the global impact of information dissemination.

In the discussion, the following point was made:

- The IARC Monographs are highly publicized worldwide and are a major source for interpreting and synthesizing evidence. Thus, continuing to support the program is a good return on NCI investments.

The first year's cost for the one-time issuance is estimated at $4.5 M for eight R01 awards, with a total cost of $22.5 M for 5 years.

Motion. A motion to concur on the re-issuance of the DCB's RFA/Limited Competition entitled "International Agency for Research on Cancer (IARC) Monographs Program" was approved unanimously.

Division of Cancer Prevention

Developing a New Low-Dose Computed Tomography (CT) Image Library to Facilitate Artificial Intelligence (AI) Development for Lung Cancer Screening (New RFA)—Dr. Paul Pinsky

Dr. Paul Pinsky, Chief, Early Detection Research Branch, DCP, presented an RFA concept on a low-dose CT (LDCT) image library to facilitate AI development for lung cancer screening. Although LDCT screening for lung cancer has been shown to reduce lung cancer mortality, specifically in the National Lung Screening Trial (NLST), the false-positive rate (FPR) of the screening test is high. Use of a lung imaging reporting and data system (lung-RADS) in current clinical practice lowers the FPR but not by appreciable amounts. A high FPR increases short-term anxiety in patients, contributes to health care costs, and reduces screening uptake. Data have revealed that reducing the FPR by 50 percent results in 40,000 fewer false-positive diagnoses annually. Developing artificial intelligence (AI) and machine-learning tools to assist radiologists in interpreting LDCT screening and diagnostic images is one approach to address this issue. One model calibrated with the NLST data led to the development of the NLST CT Image Library and is widely used in the field, but it now is outdated by 15 years. The existing NLST Library is based on data from a volunteer population, but is not representative of clinical practice and only contains results from screening examinations.

This RFP will support the creation of a new LDCT lung cancer screening image library using current LDCT technology in a standard clinical setting, with diagnostic CT images and demographics. All data will be made available to the research community through a controlled process. Retrospective de-identified images and data will be collected, and no patients will be enrolled. The goal is to test 15,000 unique subjects, collect roughly 22,500 LCDT images, and validate the algorithm using the Molecular Device Development Tool.

Subcommittee Review. Dr. Sylvia Katina Plevritis, Chair, Department of Biomedical Data Science, Professor, Department of Biomedical Data Science and Radiology, Stanford University School of Medicine, expressed the Subcommittee's support of the motivation of the concept. Dr. Plevritis conveyed the Subcommittee's concerns that the detail, justification, and composition of the new LDCT image library is not clearly defined. The methodology that is intended to be used to determine how a higher FPR is associated with CT scans needs to be provided. Details on the population diversity concerning smoking cessation, race/ethnicity, and comorbidities are lacking. The Subcommittee suggested coordinating efforts across other NCI initiatives and the FDA and to develop a mechanism for proofing future resources.

In the discussion, the following point was made:

- The concept of a new LDCT imaging library shows great promise and is addressing an unmet need, high FPR in lung cancer screening, and would benefit from a revision.

The first year's cost for the one-time issuance is estimated at $5 M for Years 1–3 and $0.5–1 M for Years 4–5, with a total cost of $17 M for 5 years.

Motion. A motion to defer the Division of Cancer Prevention's RFP entitled "Developing a New Low-Dose CT Image Library to Facilitate AI Development for Lung Cancer Screening" was approved with 23 ayes, 2 nays, and 0 abstentions.

Division of Cancer Control and Population Sciences

Social and Behavioral Intervention Research to Address Modifiable Risk Factors for Cancer in Rural Populations (New PAR)—Dr. Kelly D. Blake

Dr. Kelly D. Blake, Program Director, Behavioral Research Program, DCCPS, presented a PAR concept on social and behavioral intervention research to address modifiable risk factors for cancer in rural populations. Dr. Blake informed members that individuals in rural counties have an 8 percent higher overall cancer mortality rate than individuals in urban areas, as well as disparities in mortality specifically for some of the most common and preventable cancers. In recent years, the NCI has committed to leadership in rural cancer control. This RFA would continue those efforts as the only rural funding initiative to focus on cancer prevention, specifically primary prevention. Dr. Blake reviewed some of the challenges that influence rural/urban disparities and some of the specific benefits that can be leveraged within rural communities. She highlighted the diversity among rural populations.

The RFA includes five domains highlighting established rural/urban disparities and behavioral risk factors for cancer: (1) tobacco, (2) diet, (3) alcohol, (4) ultraviolet exposure, and (5) HPV vaccination. The objective is to solicit applications to develop, adapt, and test individual-, community-, or multilevel interventions to address modifiable risk factors for cancer in rural populations as defined using U.S. Department of Agriculture's Rural-Urban Commuting Area codes. Applications should focus on primary prevention by targeting one or more of the modifiable risk factors identified and should assess social determinants of health, cultural factors, and health care and technology policies and access barriers that may contribute to rural/urban disparities. The RFA encourages the inclusion of implementation science research and collaboration with experienced collaborators.

The PAR is labeled for clinical trial–required R01s, with applications anticipated to propose pragmatic or explanatory trials and individual-, clinic-, or community-level analysis using individual or cluster randomization. Special review criteria are requested so applicants clearly define and describe the rural populations in which the intervention research will be conducted and identify collaborators. The National Institute of Minority Health and Health Disparities has expressed interest in participating. Dr. Blake noted the ways in which the concept is relevant to NCI's mission and HHS priorities and outlined the components suggested by the subcommittee, particularly commenting on the suggestion to change from a PAR to an RFA and from an R01 to a U01.

Subcommittee Review. Dr. Cheryl L. Willman, The Maurice and Margaret Liberman Distinguished Endowed Chair in Cancer Research, The University of New Mexico (UNM) Distinguished Professor of Pathology, UNM School of Medicine, Director and CEO, UNM Comprehensive Cancer Center, UNM, expressed the Subcommittee's support for the concept, clarifying that genetic testing and genetic counseling are important but sufficiently different from this concept to require their own RFA. She emphasized the need to center interventions on targets with measurable outcomes and the importance of specificity in RUCA codes. Dr. Willman also encouraged the change to a U01 to support higher levels of funding. The Subcommittee noted the challenges with sample size in rural communities.

In the discussion, the following points were made:

- The RFA should include language requiring participation from diverse racial and ethnic communities and diverse geographic areas.

- Although detection and secondary prevention remain understudied, this RFA maintains a tight focus on primary prevention.

- Other NCI-funded activities address these gaps, but few address solely primary prevention in rural communities.

As a PAR, there are no set-side dollars for the one-time issuance and four awards in the first year.

Motion. A motion to approve the DCCPS's PAR entitled "Social and Behavioral Intervention Research to Address Modifiable Risk Factors for Cancer in Rural Populations" was approved unanimously, with the change in scope from a PAR to an RFA.

IV.   **RFA/COOP. AGR. CANCER MOONSHOT℠ CONCEPTS—NEW—NCI PROGRAM STAFF**
Office of the Director

3D Technologies to Accelerate Human Tumor Atlas Network (HTAN) Atlas Building Efforts (HTAN #1) (New RFA/Coop. Agr.)—Dr. Philipp Oberdoerffer

Dr. Philipp Oberdoerffer, Program Director, DCB, presented a new concept for time-efficient, 3D molecular characterization methods to allow imaging techniques in intact human tumor tissue. He explained that the goal of the concept is to enhance predictive modeling of therapeutic choices in cancer patients. Ongoing efforts in the HTAN focus largely on two-dimensional (2D) analyses of approximately 5 µm tissue slices. 2D analyses incur limitations (e.g., selection bias, limited preservation of special relationships). 3D analyses, on the other hand, allow for greater analytical capabilities but are time consuming and destructive to tumor tissue. The 3D analyses allow investigators to characterize markers and cell types of interest. Dr. Oberdoerffer emphasized that the concept would leverage and complement other NIH and NCI imaging efforts.

Subcommittee Review. Dr. Robert H. Vonderheide, Professor of Medicine, Perelman School of Medicine, Director, Abramson Cancer Center, University of Pennsylvania, expressed the Subcommittee's support for the concept, noting that it represents a direct line to the Cancer Moonshot℠ Initiative. He conveyed that recent advancements have enhanced the capabilities of the proposed technologies. Additionally, he expressed that the budget is appropriate.

In the discussion, the following point was made:
- The decision to make funding accessible to the broader research community will allow for the integration of emerging technologies from many disciplines.

The first year's cost for the one-time issuance is estimated at $0.25 M for three to four UH2 awards, with a total cost of $3.3 M for 3 years.

Motion. A motion to approve the OD's new RFA/Coop. Agr. entitled "3D Technologies to Accelerate Human Tumor Atlas Network (HTAN) Atlas Building Efforts (HTAN #1)" was approved unanimously.

Cancer Moonshot℠ Data Visualization Methods and Tools Development (R33) (NET #1) (New RFA)—Dr. David J. Miller

Dr. David J. Miller, Program Director, DCB, presented an RFA concept for the development of data visualization methods and tools that align with and enhance Cancer Moonshot℠ areas. The goal of the RFA is to stimulate the development of cancer data visualization tools that make data from Cancer Moonshot℠ areas more explorable and interpretable by the broader cancer research community.

Dr. Miller expressed the need for the development of visualization methods and readily usable tools to address challenges of interest across cancer research. Additionally, he emphasized the importance of distinguishing novel data visualization approaches from other NCI-supported cancer imaging and imaging data analysis research activities. He also highlighted the interdisciplinary nature of data visualization tools.

The proposed RFA represents an R33 funding opportunity supporting the development of new data visualization tools for investigator-specified, Cancer Moonshot℠-aligned use cases that enable users to explore and gain insight from the types of data and resources emerging from the Cancer Moonshot℠ components. Funding would be available to all investigators in academia and industry. Applicants must identify the use of the visualization tool and the user community in need of such a tool. In addition, applicants must describe a limited validation plan and their approach to community engagement among their targeted users.

Subcommittee Review. Dr. Christopher M. Counter, Professor, Department of Pharmacology and Cancer Biology, Duke University School of Medicine, expressed the Subcommittee's enthusiasm and support for the concept, commenting on improvements in clarity of the concept's mission compared to the original concept white paper. The Subcommittee underscored the importance of connecting computational scientists with the broader research community.

In the discussion, the following points were made:

- Applicants who submit proposals with existing data sets would be at an advantage for funding, but applicants might make the case for a community in need of a tool to visualize and utilize data. Data collection, however, would not be considered in-scope for this RFA.

- Although potential conflict exists between gaps in data visualization and criteria for evaluation, each award will be evaluated on its own terms.

The first year's cost for the one-time issuance is estimated at $1 M for four R33 awards, with a total cost of $4 M for 4 years.

Motion. A motion to approve the OD's new RFA entitled "Cancer Moonshot[SM] Data Visualization Methods and Tools Development (R33) (NET #1)" was approved unanimously.

V.   NCI SUPPORT OF COVID-19 SEROLOGICAL RESEARCH—DR. DINAH SINGER

Dr. Dinah Singer, Deputy Director, Science Strategy and Development, NCI, presented NCI's activities in response to COVID-19. She echoed Dr. Sharpless on the new Paycheck Protection Program and Health Care Enhancement Act, which was passed on 24 April 2020. The NCI was provided with $306 million to develop, validate, improve, and implement serological testing and associated technologies. Dr. Singer reemphasized that the COVID-19 funding is separate from the NCI regular appropriation and are not in the Research Project Grant Pool.

The NCI is proposing an integrated serological sciences network of core laboratories and centers, collectively called the NCI COVID-19 Serological Sciences Network, to advance capacity for laboratories and centers for serological testing and understanding of the immune response to COVID-19. The network is designed to (1) enhance collaborative efforts to expand COVID-19 testing capacity, (2) develop novel serological assays, and (3) enhance researchers' understanding of COVID-19 infection and immune response.

The network will consist of (1) the HPV Serology Laboratory, (2) Serological Sciences Capacity Building Centers, (3) Serological Sciences Centers of Excellence, (4) individual serological sciences projects, and (5) a Network Coordinating Center at FNLCR. Dr. Singer highlighted the complementary goals of each network component. She also noted that the network is being developed in close collaboration with the NIAID. The NCI plans to publish a request for information (RFI) to incorporate feedback from the research community. The RFI will remain open to responses for 10 days.

In the discussion, the following points were made:

- Dr. Singer clarified that the NCI is discussing opportunities for producing large-volume samples to assist in interpretation of results from clinical trials.

- Additionally, the NCI plans to conduct limited research in seroprotection and serosurveillance. The NCI still needs to discuss which topics are within the scope of NCI research.

- The NCI recently conducted a conference call with Cancer Centers to discuss COVID-19 ideas and is funding a collaboration on serological research. The NCI is seeking to gain a broader perspective of knowledge from the research community.

- It was noted that the NCI collects longitudinal data on patients; these data might represent an opportunity for a greater understanding of immunological responses to COVID-19. The NCI conveyed that that the COVID-19 pandemic presents new opportunities for improving interdisciplinary communications.

- The U54 funding mechanism allows for collaborative efforts between academic entities and large reference laboratory systems. The NCI is exploring many options for partnerships.

Motion. A motion to concur on establishing the NCI COVID-19 Serological Sciences Network was approved unanimously.

VI. ADJOURNMENT—DR. DAFNA BAR-SAGI

There being no further business, the 4th Virtual meeting of the BSA was adjourned at 5:24 p.m. on Tuesday, 12 May 2020.

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Date   Dafna Bar-Sagi, M.D.
Chair, Board of Scientific Advisors

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Date   Paulette S. Gray, Ph.D.
Executive Secretary, Board of Scientific Advisors