

National Institute of Dental and Craniofacial Research

National Advisory Dental and  
Craniofacial Research Council

Minutes of Meeting  
September 11, 2024

Via Videoconference

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

DEPARTMENT OF HEALTH AND HUMAN SERVICES  
NATIONAL INSTITUTES OF HEALTH  
NATIONAL INSTITUTE OF DENTAL AND CRANIOFACIAL RESEARCH

MINUTES OF THE  
NATIONAL ADVISORY DENTAL AND CRANIOFACIAL RESEARCH COUNCIL

September 11, 2024

The 237<sup>th</sup> meeting of the National Advisory Dental and Craniofacial Research Council (NADCRC) was convened on September 11, 2024, at 10:00 a.m., via videoconference. The meeting was open to the public from 10:00 a.m. until 3:48 p.m.; it was followed by the closed session for Council business and consideration of grant applications from 4:00 p.m. until adjournment at 4:29 p.m. Dr. Jennifer Webster-Cyriaque presided as Acting Chair.

**OPEN SESSION**

**Members Present**

Dr. Terry Dickinson  
Dr. Luisa DiPietro  
Dr. Stephany Duda  
Dr. Hyun (Michel) Koo  
Dr. Paul Krebsbach  
Dr. Jose Moron-Concepcion  
Dr. Jacques Nor

***National Institute of Dental and Craniofacial Research***

Dr. Jennifer Webster-Cyriaque, Acting Director  
Dr. Lynn King, Executive Secretary, and Director, Division of Extramural Activities (DEA)  
Mr. Aubrey Callwood, Chief Information Officer; Director, Office of Information Technology (OIT)  
Ms. Joy Postell, Chief Diversity Officer, Office of the Director (OD)  
Dr. Lillian Shum, Director, Division of Extramural Research (DER)  
Mr. Dandre Amos, OD, Office of Clinical Trials Operations & Management (OCTOM)  
Dr. Lorena Baccaglini, DER, Center for Clinical Research (CCR)  
Ms. Margaret Beach, Division of Intramural Research (DIR), Office of the Scientific Director (OSD)  
Dr. Christopher Brown, DEA, Scientific Review Branch (SRB)  
Dr. Christopher Campbell, DEA, SRB  
Dr. Preethi Chander, DER, Salivary Biology and Immunology Program  
Dr. Jingshan Chen, DEA, SRB  
Dr. Aiwu Cheng, DEA, SRB  
Ms. Jennifer Chi, OD, OCTOM  
Ms. Alicia Chou, DER, Translational Genomics Research Branch (TGRB)

Dr. Michelle Cortes, DER, IBIDB  
Dr. Bill Elwood, DER, Behavioral & Social Sciences Research Branch (BSSRB)  
Dr. Olga Epifano, DEA, OD  
Dr. Dena Fischer, DER, Director, CCR  
Dr. Melissa Ghim, DER, Integrative Biology & Infectious Diseases Branch (IBIDB)  
Mr. Harry Grant, DIR, OIT  
Dr. Margaret Grisius, DER, CCR  
Mr. Joel Guzman, DER, OD  
Ms. April Harrison, DEA, Grants Management Branch (GMB)  
Mr. Gabriel Hidalgo, DEA, GMB  
Dr. Hiroko Iida, DER, CCR  
Dr. Dara Kessler, OD  
Dr. Leila Khaki, DER, BSSRB  
Dr. Zohreh Khavandgar, DIR, OSD  
Dr. Jeffrey Kroopnick, OD, OCTOM  
Dr. Shuang Li, OD, DER  
Dr. Orlando Lopez, DER, IBIDB  
Ms. Robbie Majors, DEA, GMB  
Dr. Jill Mattia, DER, BSSRB  
Dr. Tamara McNealy, DER, IBIDB  
Ms. Susan Medve, DEA, GMB  
Dr. Yun Mei, DEA, SRB  
Dr. Amanda Melillo, DER, IBIDB  
Ms. Amy Mhatre-Owens, OD, OCTOM  
Mr. Paul Newgen, DEA, GMB  
Ms. Anna Nicholson, OD, OCTOM  
Mr. Thomas O'Farrell, DEA, SRB  
Dr. Noffisat Oki, DER, TGRB  
Ms. Marshelle Parker, DEA, GMB  
Ms. Lisa Peng, OD, OIT  
Dr. Zubaida Saifudeen, DER, TGRB  
Dr. Rachel Sare, DER, RTCDB  
Dr. Yasaman Shirazi, DEA, SRB  
Ms. Ashley Smith, OD, OIT  
Dr. Shoba Thirumangalathu, DEA, RTCDB  
Dr. Scott Verbridge, DER, IBIDB  
Dr. Jason Wan, DER, IBIDB  
Dr. Lu Wang, DER, CCR  
Dr. Blake Warner, DIR, Salivary Disorders Unit, Sjögren's Disease Clinic  
Ms. Stacey Warr, OD, OIT  
Ms. Karon Yarborough, DEA, OD

***National Institutes of Health***

Dr. Sheri Schully, Chief Medical and Scientific Officer, NIH *All of Us* Research Program

### ***Guests***

Dr. Dana Graves, Penn Dental Medicine; Chair, Oral Health Research Workforce Working Group  
Dr. Christopher Lessard, Oklahoma Medical Research Foundation  
Dr. Sara McCoy, University of Wisconsin–Madison  
Dr. Caroline Shiboski, University of California San Francisco  
Mr. Matthew Miller, Neal R. Gross & Co.

### ***Videocast***

Virtual participants: 320, 218 (live), 102 on demand

## **I. WELCOME**

Dr. Lynn King, Director of the Division of Extramural Activities (DEA) and Advisory Council Executive Secretary, called the open session of the 237<sup>th</sup> Advisory Council meeting to order at 10:00 a.m. Members of the public may submit written comments and questions until September 28<sup>th</sup>, 2024, at [NIDCRCouncilMail@nidcr.nih.gov](mailto:NIDCRCouncilMail@nidcr.nih.gov). Dr. King briefly reviewed the virtual meeting logistics.

## **II. APPROVAL OF MINUTES FROM PREVIOUS MEETING**

Dr. King asked the Advisory Council if there were corrections or comments on the minutes of the May 22<sup>nd</sup>, 2024, Advisory Council meeting. There were no comments, and the Council voted unanimously to approve the minutes.

## **III. DIRECTOR'S REPORT**

Dr. Webster-Cyriaque's written Director's Report was provided to the Council members and is available on the NIDCR website (<http://www.nidcr.nih.gov>).

Dr. Webster-Cyriaque reviewed the meeting agenda and began by updating the Council on recent programs and activities of note that have emerged from the White House in recent months. NIDCR is working to respond to the President's Executive Order (EO) 14120 to advance women's health research and innovation and has several active initiatives that align with the goals of the EO. Examples include the Maternal Health and the Dental, Oral, and Craniofacial (DOC) Health and Development of their Children initiative and NIDCR's programs on temporomandibular disorders, conditions that disproportionately affect women. Dr. Webster-Cyriaque also provided an update on the status of planning for next year's federal budget. The President's FY 2025 budget request calls for increased budgets for both NIH (\$1.25B) and NIDCR (\$1.532M). The House's appropriations proposal was released in July and included a flat budget for NIH and language that would restructure and merge certain Institutes and Centers, including NIDCR. The Senate's budget

proposal was released in August and called for \$1.77B for NIH but a flat budget for NIDCR. Congress is currently negotiating short-term proposals to fund the federal government through the rest of 2024 and possibly into early 2025. The most likely outcome of these negotiations is a continuing resolution that funds federal agencies at pre-existing levels. NIH's budget increased 1% from FY23 to FY24 and NIDCR's budget remained flat during the same period. In practical terms, this has amounted to a decrease in purchasing power due to inflation. Dr. Webster-Cyriaque reviewed how NIDCR's budget is spent and noted that almost 80% goes towards the extramural research program. NIDCR's Research Project Grant (RPG) success rates have remained comparable to NIH-wide rates. NIDCR is proud of its support for dental schools across the country and the Institute continues to be the leading funder of dental schools at NIH, representing 63% of total NIH funds directed towards dental schools in 2023.

Dr. Webster-Cyriaque highlighted several noteworthy NIH-initiatives. Engaging the Public as Partners in Clinical Research (ENGAGE) is a program that aims to develop a vision and framework for incorporating public voices in all phases and types of clinical research and includes a Request for Information that was open from July through August. She reminded the Council that NIH's new simplified review framework will begin on January 25, 2025. The new framework will reduce the number of main review factors from five to three: importance of the research, rigor and feasibility, and expertise and resources. NIH has recently released a centralized guidance and policy resources hub for the use of artificial intelligence (AI) in clinical research.

Dr. Webster-Cyriaque updated the Council on staff changes at NIDCR. Dr. Michael Collins recently retired after a 25-year career at NIH. Dr. Collins served as chief of the NIDCR Skeletal Disorders and Mineral Homeostasis Section. Dr. Webster-Cyriaque was saddened to relay that Theresa Ann (Terrie) Cowley passed away on July 22, 2024. Ms. Cowley was the co-founder and president of the TMJ Association and was a fierce advocate for individuals suffering from TMD.

NIDCR leadership has been active this summer participating in conferences and seminars at academic institutions across the country, including University of Maryland, University of North Carolina, A.T. Still University, and University of the Pacific, as well as events held by national dental associations and federal agency events.

The Institute published Requests for Application (RFAs) in 2023 and four RFAs thus far in FY24. Dr. Webster-Cyriaque described how the RFAs align with the NIDCR's five strategic priorities: integration of oral and general health, precision dental medicine, translation and implementation of findings, partnerships and collaborations to increase impact, and diversifying the research pathway. The new initiatives for 2024 are Understanding Persistent Oral Human Papillomavirus and Human Immunodeficiency Virus Co-infection and its Role with Oropharyngeal Cancer Induction, Collaborative Science to Achieve Disruptive Innovations in DOC Research, Developing Salivary Components as Therapeutics for Oral Health, and the NIDCR Award for Sustaining Outstanding Achievement in Research (SOAR). There are an additional nine Council-approved concepts and reissuances that are currently in the planning stage. Dr. Webster-Cyriaque highlighted several upcoming trans-NIH initiatives of note, including the Whole Person Research and Coordination Center and Enhancing Mechanistic Research on Precision Probiotic Therapies, a number of initiatives from the HEAL Initiative, as well as several NIDCR-related Notices of Special Interest (NOSIs).

NIH and NIDCR continue to prioritize efforts to support growing and diversifying the research workforce. Existing and upcoming examples include the NIDCR Dental Public Health Research Fellowship, the NIH Research Software Engineer (RSE) Award, the Strengthening Research Opportunities for NIH Grants (STRONG) program, the Ruth L. Kirschstein National Research Service Award (NRSA), the NIDCR Mentored Career Development Award to Promote Broad Participation in Research, the NIDCR Participation in a Summer Research Education Experience Program, Research Supplements to Promote Re-entry, Re-integration, and Re-Training in Health-Related Research Careers, and the NIGMS Science Education Partnership Award (SEPA). NIDCR will also be participating in the NIH Diversity Supplement Professional Development and Networking Workshop to be held virtually September 24-25 and is co-sponsoring with the National Academies a Workshop on Advancing Oral Health Across the Lifespan that will take place in Washington, D.C., November 18-19, 2025. Dr. Webster-Cyriaque encouraged interested parties to register and take part in both workshops.

Dr. Webster-Cyriaque spotlighted several research highlights from recent NIDCR-funded studies. These included a study that revealed a potentially novel hedgehog-mediated mechanism that facilitates osteogenic cell fates of skeletal cells in the resting zone of the growth plate, research on targeting dendritic cell dysfunction to circumvent anti-PD1 resistance in head and neck cancer, and a craniofacial development study that found that apical expansion of calvarial osteoblasts and suture patency is dependent on fibronectin cues.

Dr. Webster-Cyriaque shifted gears to discuss NIDCR's efforts to align with the NIH Director's critical priorities of expanding NIH's data sharing and data use capabilities and efforts to address gaps in evidence to strengthen primary care in all communities. On the data front, NIDCR is aligned with the NIH Data Management and Sharing Policy and has a long history of supporting biomedical data resources and repositories, such as FaceBase and the Human Oral Microbiome Database. The NIDCR Council established a Data Science Strategy Working Group that developed recommendations regarding the Institute's data science strategy and general data use guidance. NIDCR strives to ensure that NIDCR-supported researchers, both intramural and extramural, are implementing NIH data sharing and data use requirements and best practices, improving the Institute's data infrastructure, expanding the use of common data elements, and supporting data science research and training initiatives. Dr. Webster-Cyriaque reviewed the Data Science Strategy Working Group's findings and recommendations, and directed attendees to the report itself, which has been posted on the NIDCR website, for further details. The Working Group's five overarching recommendations were to create a data infrastructure tailored to DOC research; modernize the DOC-specific data ecosystem; develop data management, analytical, and visualization tools; enhance data science workforce development with inclusive training; and promote data stewardship and sustainable data policies. As part of its response to the Working Group recommendation, NIDCR will be launching the Data Driven Science (DDS) Hub later this year, which will provide tools for data science research and guidance on data sharing and reuse, among other resources. NIDCR continues to collaborate and partner with other ICs and external organizations' data repositories and/or data sharing activities. Dr. Webster-Cyriaque spotlighted a data science-focused initiative called Advancing Data and Practice Transformation for Caries Equity (ADAPT-EQ), which aims to establish "a research consortium and data hub to support community-based participatory approaches to design, implement, and evaluate population-based intervention

strategies for reducing dental caries disparities and inequities in target populations." This program is in partnership with the National Institute on Minority Health and Health Disparities (NIMHD) Science Collaborative for Health Disparities and Artificial intelligence bias Reduction (ScHARe). Dr. Webster-Cyriaque presented examples of data-driven DOC-relevant research advances that have already been achieved, including the use of single-cell transcriptomics to reveal profiles of immune subsets in childhood Sjögren's disease, the development of deep-learning microscopy for slide-free histology, and the identification of transcriptomic profiles associated with experimental placebo effects in TMD patients with chronic pain.

Dr. Webster-Cyriaque then described NIDCR's efforts that align with the NIH Director's clinical and primary care critical priority. NIDCR has long prioritized research collaborations that advance DOC clinical work and address health disparities, notably via the longstanding Dental Practice-Based Research Network (PBRN) and the newly launched Practice-Based Research Integrating Multidisciplinary Experiences in Dental Schools (PRIMED). NIDCR has conducted a systematic review of its clinical trials to assess participation levels among underserved populations and is creating web-based educational resources for the research community and the public on the value and methods of biomedical research. The Institute is also developing a new enrollment and retention policy designed to maximize return on investment of NIDCR-funded clinical research. Dr. Webster-Cyriaque highlighted several NIDCR initiatives focused on the clinical realm, including scientific efforts, outreach to patient advocacy groups, training programs, and efforts to make NIDCR more accessible and culturally competent.

#### **IV. THE *ALL OF US* RESEARCH PROGRAM AND THE VALUE OF NIDCR**

Dr. Webster-Cyriaque introduced Dr. Sheri Schully, Deputy Chief Medical and Scientific Officer of the NIH *All of Us* Research Program, to deliver her presentation to the Council on the work of the program and potential avenues for collaboration with NIDCR. The mission of the *All of Us* Research Program is to "accelerate health research and medical breakthroughs, enabling individualized prevention, treatment, and care for all of us." The program aims to achieve this by ultimately enrolling over one million long-term participants who reflect the diversity of the U.S. in order to develop one of the largest broadly available and secure biomedical datasets. As of September 2024, the *All of Us* Research Program enrolled over 834,000 participants, with access to electronic health records (EHR) for over 453,000 participants and has collected over 587,000 biosamples. One of the goals of the program is to enroll individuals from groups historically underrepresented in biomedical research; thus far, over 87% of enrolled individuals fit into one or more such category. Dr. Schully noted that underrepresented categories go beyond race/ethnicity to include sexual and gender minorities, disabled populations, rural residents, and lower educational attainment and income levels, among others.

Dr. Schully walked through the current enrollment protocol for adult participants and subsequent steps of participation, which include surveys, physical information, biosamples, and data from wearables. She highlighted the ability to send out surveys to respond to dynamic health events in real-time, most notably during the COVID-19 pandemic. The program currently collects blood, saliva, and urine as biospecimens, from which genotyping and whole genome sequencing are performed. Participants receive health-related and other genomic data back post-

sequencing. The program uses genomic counseling for the return of certain medical data where appropriate. Over 200,000 participants have viewed their genetic ancestry and traits reports, almost 150,000 have viewed their hereditary disease risk report, and approximately 142,000 participants have seen their Medicine and Your DNA report, which analyzes genes that have known effects with some medications. Approximately 3% of participants who have received their hereditary disease risk report have a potentially life-changing genetic variant, which accords with the estimates from the population at large.

Dr. Schully reviewed the resources and tools available that the *All of Us* Research Program offers, a number of which are available to the public without registration. Registered researchers receive access to in-depth Researcher Workbench data and research tools, while researchers with institutional agreements can access expanded data, including genomic and more granular demographic data. Dr. Schully presented examples of the types of data and tools available in the public, open access Data Browser and the Researcher Workbench for registered researchers. The cloud-based Researcher Workbench contains results from almost two million participant surveys, 245,000 whole genome sequences, over 14 million aliquots of biosamples, as well as physical measurement, EHR, and wearable tech data. The available data will expand greatly in the coming weeks with the release of the newest version of the Researcher Workbench. The program also continues to add new coding and graphical tools for creating cohorts and datasets.

The *All of Us* Research Program is committed to researcher diversity as well as participant diversity; 78% of its approximately 12,500 researchers are from populations underrepresented in the biomedical research workforce. Thus far, over 630 articles have been published that use *All of Us* data. Aside from the large and diverse data repository and resources, *All of Us* also benefits researchers by offering re-contactable participants, reducing time and resources, providing access to novel tools and data, and through continuous expansion of data types and tools. The *All of Us* Center for Linkage and Acquisition of Data (CLAD) was recently established to securely acquire and process linked data, such as claims and mortality data. The program is also working to include dental records in this process in the future and plans to include new oral health questions into its survey reassessment in early 2025. Inclusion of dental records would be very relevant as the *All of Us* Research Program begins its expansion into pediatric populations.

Finally, Dr. Schully discussed the program's ancillary studies in which *All of Us* partners with NIH ICs to generate new data from biospecimens, custom studies for recontact surveys or unique wearables, and embedded studies such as Nutrition for Precision Health. These studies help lay the groundwork for eventually allowing for investigator-initiated proposals by 2026. Dr. Schully also highlighted potential topics for how *All of Us* Research Program data can be leveraged to address NIDCR's strategic priorities. Examples include social and lifestyle factors that contribute to disparities in susceptibility and treatment of disease, connecting dental health records to the *All of Us* data ecosystem, and using longitudinal EHR and genomics data to elucidate both health and disease-state DOC functioning, among other topics.

## Discussion



Dr. Paul Krebsbach asked Dr. Schully to comment on the program's strategies for engaging vulnerable populations and maintaining those relationships over the long term. Dr. Schully said that *All of Us* has partnered with community organizations to serve as guides and believes in a "meet them where they are" approach to engaging historically underrepresented populations, whether that be churches or local community centers and/or other gathering spots. Dr. Webster-Cyriaque applauded the program for including additional DOC questions in its surveys, which acknowledges the central role oral health plays in overall health. She also pointed to the ADAPT-EQ program as an example of how NIDCR is trying to engage vulnerable populations. Dr. Schully said that *All of Us* is always looking for more community partners and encouraged interested groups to reach out. Dr. Blake Warner asked if there are future plans for the program to allow for external datasets to be incorporated into *All of Us*. Dr. Schully said the program is currently working to enable researchers to bring datasets into their *All of Us* workspaces so they can perform comparative analyses and have near-term plans to expand its 'omics tools. Incorporating larger NIH-wide datasets is still in the conceptual phase but something that might happen further down the road.

## **V. ORAL HEALTH RESEARCH WORKFORCE WORKING GROUP - DISCUSSION OF RECOMMENDATIONS**

Dr. Webster-Cyriaque invited Dr. Dana Graves, Chair of the Council's Oral Health Research Workforce Working Group, to review the Working Group's findings and recommendations prior to discussion by the Advisory Council.

The Working Group's charge was to "develop and recommend evidence-based approaches to sustainably recruit, train, and retain researchers who have knowledge to build a diverse DOC [Dental, Oral, and Craniofacial] research workforce." The group recognized early on that there was limited information available to evaluate the factors that lead to a healthy DOC workforce. To assess the current landscape and identify success factors and gaps, the Working Group issued an RFI and conducted a series of listening sessions with stakeholders from the broader DOC research community. This Working Group found that there was a lack of consensus on successful recruitment and outreach strategies, that dental schools often do not provide the support necessary for sustainable research careers, and that clinician-scientists lack protected research time. There were also concerns that there is a low percentage of funded grants and that there is a lack of awareness about NIDCR research training and career development opportunities. The Working Group also found that mentorship is often lacking during important career transition stages and there are concerns about financial debt and lower pay for research-focused careers, among other findings.

The Working Group's subsequent recommendations prioritized improving mentoring and trainee success rates, enhancing DOC training opportunities to make careers in DOC research more appealing, reducing financial limitations, and increasing interdisciplinary research in emerging fields. Dr. Graves summarized the Working Group's overarching recommendations. The Working Group recommended that NIDCR establish an office to promote partnerships with professional societies, foundations, and industry to enhance outreach, mentorship, recruitment, and research opportunities. In order to better inform future workforce analysis efforts, the

Working Group recommended that a center be established to assess training programs and career outcomes and gather related metrics to support analysis. The group also recommended that NIDCR develop grant programs that promote mentorship at multiple stages of early career development and training, and programs to reduce financial hurdles to career progression. Finally, the Working Group recommended that career opportunities be enhanced through programs that support early-stage investigator (ESI) clinician-scientists and allow for clinical teaching and protected research time. The Working Group's full report will be released soon.

## Discussion

Dr. Jacques Nor invited Dr. Graves to expand on how NIDCR can work with dental schools to better support clinician-scientist faculty positions. Dr. Graves said one example would be to create a more balanced version of the K award, which currently requires the investigator to spend 75% of their time on research and thus severely constrains the clinician-scientist's ability to both teach and practice in the clinic. A more tailored award that allowed for 40% research, 40% clinical teaching, and 20% clinical practice, for example, could greatly increase the ability of clinician-scientists to participate in clinical research. Dr. Jose Moron-Concepcion noted that many dental schools are supportive of protected research time in theory, but it can often simply not be financially viable. Dental schools also face challenges when it comes to the retention of clinical faculty, which can usually only be prevented by raising salaries, particularly in a competitive market when there is a dearth of candidates. Dr. Graves said dental school representatives raised these same concerns in the Working Group listening session. Dr. Graves suggested that NIDCR can help address these concerns by partnering with professional societies on grant programs where NIDCR funds the research portion and the professional society provides support for the faculty teaching component. He added that one way for dental schools to improve retention is to allow clinician-scientists to focus on research that they are interested in, which they are not likely to find in private practice. Dr. Michel Koo said that the bottom line, in many cases, will be financial considerations. Dr. Graves said the Working Group recommended that NIDCR enhance its loan forgiveness program to help address the debt issue, which was brought up repeatedly in the listening sessions as a major financial concern. Lack of protected time was more commonly raised than salary as a primary reason for leaving academia.

Dr. Stephany Duda asked if the Working Group had recommendations related to expanding the dental informatics workforce. Dr. Graves said there are several recommendations calling for additional training opportunities for clinician-scientists. Professional societies expressed interest in partnering with NIDCR to offer, for example, a post-residency training program that could be focused on research areas such as bioinformatics. Dr. Webster-Cyriaque noted that the Foundation for the NIH (FNIH) specializes in helping develop collaborative programs between NIH ICs, industry, and professional societies while ensuring that these partnerships adhere to federal guidelines. Dr. Graves said that several of the Working Group's recommendations reflect the fact that the DOC research community at large needs help from NIDCR in discovering and navigating the various partnership opportunities that are available. Dr. Krebsbach asked if the Working Group discussed the financial implications of carrying out its recommendations. Dr. Graves said the Working Group was very aware of cost throughout its deliberations and agreed that the workforce problem cannot be solved with money. Indeed, the recommendation to develop a center to collect and analyze research training program data is an

attempt to determine whether the money that is currently being spent on training and career development is being spent efficiently and effectively. Dr. Luisa DiPietro added that the professional societies were very eager to collaborate on many of these efforts and leveraging partnerships would reduce the cost on NIDCR considerably.

Dr. Graves and the Council discussed the financial constraints faced by dental schools and what the ideal time proportions are for clinician-scientists in academia for purposes of potential NIDCR grants. Dr. Krebsbach cautioned that dental schools can vary widely in terms of the support they offer to clinician-scientists interested in research; in some schools the 40% suggestion would be viable, while in others it would not be feasible. Dr. King said this highlighted the importance of keeping dental schools in the loop when it comes to NIDCR developing partnerships with professional societies.

Dr. King asked the Council if they were ready to vote for concurrence on the Working Group's recommendations. Dr. Krebsbach said the Working Group did a really good job on a difficult task, but he would like to see further discussion between NIDCR and the Council on the practical details. Drs. Nor and Koo seconded Dr. Krebsbach. Dr. DiPietro pointed out that the full Working Group report will go into greater depth on the Working Group's rationale for the recommendations than what was discussed at this meeting. She noted that the Working Group avoided being too prescriptive because it believed the details should be left to the Institute to determine based on its resources and priorities. Dr. King thanked Dr. DiPietro for clarifying that point and interpreted the Council's comments as being supportive of the overarching recommendations. She encouraged Council members to submit any additional comments to her and Dr. Webster-Cyriaque after the meeting.

## **VI. INTRODUCTION TO ACCELERATING MEDICINES PARTNERSHIP AUTOIMMUNE AND IMMUNE-MEDIATED DISEASES (AMP-AIM) PROGRAM**

Dr. Webster-Cyriaque provided an introduction on NIH's AMP AIM program to set the stage for a "mini-symposium" on DOC-related AMP AIM activities for the Council. AMP AIM is an exemplar of an NIH public-private partnership that drives clinical research, data acquisition, and data science, and NIDCR administers one of its programs, the Sjögren's Team for Accelerating Medicines Partnership (STAMP). NIDCR is also one of the sponsoring ICs for AMP AIM's Team Science Leadership Scholars Program (LSP) in Women's Health, Autoimmune and Immune-Mediated Diseases. AMP AIM's goal is to develop new ways of identifying and validating biologic targets for novel drug development in the area of autoimmune research. The program is a partnership between NIH, the U.S. Food and Drug Administration (FDA), biopharmaceutical and life science companies, and nonprofit organizations. AMP AIM is managed by FNIH and has been budgeted at \$62.36M. The participating NIH ICOs are NIDCR, NIAMS, NIAID, NEI, and the Office of Research on Women's Health, and the target diseases are rheumatoid arthritis (RA), psoriatic spectrum disease, systemic lupus erythematosus (SLE), and Sjögren's disease. AMP AIM funds three categories of initiatives: opportunity funds for new technologies and pilot programs, pain supplements to help delineate pain phenotypes in autoimmune diseases, and the Leadership Scholars Program to enhance training and mentorship opportunities in team science. Today's

presentations will discuss the activities of the STAMP program and the AMP AIM Leadership Scholars Program.

## **VII. OVERVIEW OF SJÖGREN'S TEAM FOR ACCELERATING MEDICINES PARTNERSHIP (STAMP) AND CLINICAL PIPELINE**

Dr. Caroline Shiboski, University of California San Francisco, STAMP co-PI and steering committee member, presented an overview of the STAMP program and its clinical research pipeline.

STAMP is a multidisciplinary team with five clinical sites across the country, including co-investigators from the NIDCR intramural program. Dr. Shiboski highlighted that 63% of STAMP's 35 investigators are women. STAMP is currently in its scale-up phase, and its goals are to develop protocols to understand the phenotypic and molecular heterogeneity of Sjögren's disease, the disease mechanisms inherent to disease progression, identify therapeutic targets, and understand the overlap of disease mechanisms between Sjögren's, RA, and SLE. Dr. Shiboski also described the three general aims of STAMP's five-year scientific agenda: predicting Sjögren's disease development and progression, using multi-omic data to elucidate molecular and phenotypic heterogeneity and identifying interactions between immune cells and glandular secretory/ductal cells, and identifying determinants of glandular tropism.

STAMP is a cross-sectional study with a longitudinal component that leverages the ability to recall Sjögren's International Collaborative Clinical Alliance (SICCA) and Oklahoma Medical Research Foundation (OMRF) study participants. The main cohort will enroll 300 participants with symptoms of Sjögren's disease, the longitudinal follow-up cohort will enroll 185 participants, and there will also be a 20-person cohort of individuals with both Sjögren's disease and SLE, along with 63 healthy controls. Dr. Shiboski reviewed the steps of a STAMP participant's visit, which includes a battery of questionnaires and collection of biospecimen samples for oral/salivary, rheumatologic, and ocular assessments. STAMP has completed the planning and pilot phases for sample procurement and calibration, and has enrolled 185 participants, mostly in the main cohort. Dr. Shiboski discussed how STAMP participates in the AMP AIM network early disease project that aims to investigate the shared cellular and molecular pathways and interactions across the AMP AIM diseases. To do so, the STAMP team had to develop a proposed definition of early Sjögren's disease. As part of the early disease project, disease-specific tissues will be deeply phenotyped via histology, spatial multi-omics, single-cell analyses, and microbiome analyses. Early disease participants will be divided into Ro+ and Ro- cohorts to account for potential differences in severity and time of disease onset. Finally, STAMP is also participating, along with the Lupus Omics Cutaneous Kidney Investigation Team (LOCKIT), in one of the AMP AIM opportunity fund projects that aims to evaluate mothers of children with neonatal lupus to provide insight on the protective and permissive factors of Sjögren's disease.

## VIII. STAMP SINGLE CELL AND SPATIAL TECHNOLOGIES IN THE SALIVARY GLAND

Dr. Blake Warner, NIDCR Stadtman Tenure Track Investigator and STAMP co-investigator, discussed his STAMP pilot study to identify the best spatial reconstruction platform for use in the STAMP studies. The pilot found that the Xenium 10x Genomics spatial transcriptomics platform slightly outperformed the Nanostring CosMx. Dr. Warner's team then determined which single-cell platforms worked best with the Xenium platform. He described how the Xenium system works and noted STAMP's multi-omics workflow is based on formalin-fixed paraffin-embedded (FFPE) tissue samples. Dr. Warner's team piloted spatial reconstruction of Sjögren's disease-affected salivary glands using gene expression panels that included the 10X Genomics Prime 5K panel. Dr. Warner's team also constructed minor salivary gland tissue microarrays to optimize analysis techniques in the STAMP program and showed how the Xenium Explorer platform could be used to analyze cells in tissue samples. He also discussed how machine learning tools and other third-party applications can be used to identify cell-type-enriched neighborhoods in Sjögren's disease-affected cells, potentially predicting druggable targets and allowing for the ability to monitor therapeutic targets over time *in situ*. The Xenium Prime 5K platform allows for same-slide multi-omics analyses.

Dr. Christopher Lessard, OMRF Genes and Human Disease Research Program and STAMP co-investigator, discussed his work on STAMP pilot studies of single-cell transcriptomics technologies. Historically, there have been few single-cell RNA sequencing (scRNA-seq) studies on salivary glands and Sjögren's disease, and previous work relied on fresh tissue samples. Recent technological advances by 10X Genomics have enabled the use of FFPE for single-cell transcriptomics via the Chromium Single Cell Gene Expression Flex system. Dr. Lessard described the workflow for the scFFPE mass cytometry analysis of minor salivary glands. Among other benefits, scFFPE analysis provides spatial context, pairs well with spatial transcriptomic platforms, and may reduce survivorship bias. The downsides are that scFFPE requires the use of probes and does not allow for CITE-Seq (Cellular Indexing of Transcriptomes and Epitopes by Sequencing). As part of the STAMP pilot phase, Dr. Lessard's team devised a pilot to compare 3' and 5' sequencing techniques and the scFFPE analysis and found good agreement between the technologies in terms of genes captured per cell. The pilot found extreme survivorship bias in the live cell assays and found that scFFPE captures more of many types of cells than 3' and 5' scRNA-seq. The OMRF team also performed pilot analyses on Ro+ Sjögren's disease cells compared to non-Sjögren's cells using scFFPE analysis which showed that the technology can identify diverse immune cell subsets. Dr. Lessard said his team has been impressed with how clean the scFFPE results are compared to other single-cell technologies. These and other pilot results gave STAMP the confidence to move forward with using scFFPE in the network's early disease project, in conjunction with 5'-CITE-seq and other complementary technologies.

## IX. LEADERSHIP SCHOLARS PROGRAM

Dr. Sara McCoy, University of Wisconsin School of Medicine and Public Health, delivered the presentation on the AMP AIM Team Science Leadership Scholars Program (LSP) in Women's Health, Autoimmune and Immune-Mediated Diseases. One of the major gaps that LSP was designed to address is the high burden of autoimmune disorders among women. Almost 80% of people with autoimmune disease are women, and that percentage is even higher in individuals with Sjögren's disease. The AMP AIM LSP hopes to advance understanding of this health disparity and identify ways in which it can be mitigated by supporting research specializing in women's health and autoimmune disease. The program's other goals include developing its scholars' skills in team science, offering leadership and mentoring opportunities, and offering the ability for scholars to integrate their research into the larger AMP AIM project. Dr. McCoy then described her research on salivary gland fibroblasts that she is conducting as an LSP scholar. In particular, the work is using RNA-seq to better understand the effects of inflammation on the fibroblast transcriptome. Dr. McCoy has two AMP AIM mentors supporting her team, including Dr. Warner, as well as a bioinformatician from the AMP AIM Systems Biology Core. Dr. McCoy's research has shown differential gene expression in fibroblasts between Sjögren's patients and healthy controls. She highlighted the finding that the FMO2 fibroblast subsets are present in salivary gland fibroblasts and that they interact uniquely with other immune cell types in Sjögren's disease. Among the next steps for Dr. McCoy's team will be to look to correlate cell proportions to clinical phenotypes and symptoms and expand the research into other stromal cells.

## **X. CONCEPT CLEARANCES**

Dr. King stated that NIDCR is required to document the clearance of concepts by presenting the purpose, scope, and objectives of proposed concepts for research initiatives to the Council in a public forum for the Council's review, discussion, and approval, and for public comment. Concepts approved by the Council are published on the NIDCR website ([future research initiatives](#)). NIDCR staff presented five concepts, and designated Council members led the discussions, as summarized below.

### Dental Primary Care Practice-Based Research Network (PBRN) to Support Research in Clinical Practices

Dr. Dena Fischer, Director, Center for Clinical Research, DER, presented the concept. The goal of the concept is to continue NIDCR's support of practice-based research by establishing a Dental Primary Care PRBN that builds on the knowledge gained from past and current NIDCR-supported PBRNs. The network will focus on integrating oral health care into whole patient care while enabling research on oral health topics in a variety of practice settings and locations. Dr. Fischer briefly reviewed NIDCR's history supporting several cycles of PBRNs across the country, including the currently active National Dental PBRN that has been running since 2019. The National Dental PBRN is supported by an Administrative and Resource Center and Network Coordinating Center and has six regional nodes and one specialty dentistry node. Thus far, approximately 5700 practitioners have enrolled over 75,000 patients in PBRN studies and have contributed data from over 790,000 patients' health records. The Dental Primary Care PBRN will leverage this successful network model to prioritize research topics that integrate oral

health care into whole person care and will focus on recruiting practitioners who serve underserved populations and/or practice in rural areas.

The Council's lead discussants for the concept were Dr. Luisa DiPietro and Dr. Terry Dickinson. Dr. DiPietro expressed strong support for the concept, citing NIDCR's history of success with PBRNs in terms of enrollment, publications, and engagement of practitioners in research. She expressed enthusiasm for the Dental Primary Care PBRN's inclusion of clinical research skills training and mentoring, emphasis on recruiting practitioners from rural and underserved areas, and the overall goal of integrating oral health with overall healthcare. These priorities align with NIDCR's strategic goals and the NIH Director's critical priorities. Dr. Dickinson concurred with Dr. Pietro and added that he hopes this concept will provide evidence about clinical decision-making. He expressed some caution about the broad scope of the concept that may lead to challenges in terms of implementation. Dr. Krebsbach suggested that NIDCR conduct an impact assessment of the PBRNs to see if this investment over the decades has led to transformative changes in clinical care. Dr. Fischer said NIDCR has performed assessments at the end of each PBRN cycle. As an example of the PBRNs influencing clinical care, Dr. Fischer noted that dental practices are trending towards less invasive treatment approaches based on research that has emerged from the PBRNs. Dr. Fischer and Dr. Krebsbach discussed the importance of finding ways to effectively disseminate research findings that emerge from the PBRN. Dr. DiPietro added that dental schools have a role to play in increasing awareness of initiatives like PBRNs.

The Council unanimously approved the concept.

#### Digital Twins for Advancing Innovation and Optimizing Clinical Outcomes in DOC Medicine

Dr. Orlando Lopez, Director, Dental Materials and Biomaterials Program, DER, presented the concept. The concept aims to catalyze innovation by accelerating the development and translation of cutting-edge DOC technologies by leveraging digital twins to create digital replicas for predictive testing and innovation. Digital twin platforms have the potential to transform treatment by allowing providers to build digital replicas of patient anatomy, biological systems, and clinical scenarios, and integrate real-time data and predictive analytics to revolutionize treatment planning with precision and personalization. Digital twin technologies also offer the possibility of real-time simulations to enhance diagnostic accuracy and enable continuous, patient-specific adjustments to optimize care delivery. Dr. Lopez discussed the gaps and opportunities that this concept can address and highlighted several examples of possible research topics under the concept, such as individualized treatment planning, early detection and intervention, and development of new DOC tools, among other topics.

The Council's lead discussants for the concept were Drs. Duda and Koo. Dr. Duda said she was excited to see NIDCR supporting research into this cutting-edge technology in the field of biomedical research but emphasized the importance of maintaining patient privacy and implementing cybersecurity protections. She added that the ethical considerations of digital twins in biomedical research may not be fully understood and encouraged NIDCR to continue to keep that on its radar. Dr. Duda also noted that the concept aligns with the recommendations of the Council's Data Science Working Group. Dr. Koo agreed with Dr. Duda's comments and added

that accounting for the biological heterogeneity of individual patients might be a challenge for digital twin technologies. He suggested focusing on methodologies because of the newness of the technology and recommended including the microbiome and infectious diseases as potential areas of interest. Dr. Lopez said that there is a federal effort underway, led by the Fast-Track Action Committee on Digital Twins, to develop a strategic plan for digital twin research at the national level and work on how to address the critical infrastructure needs and some of the other issues raised by the discussants.

The Council unanimously approved the concept.

#### Integration of Medically Necessary Prevention, Treatment, and Monitoring of Oncologic-Related DOC Complications

Dr. Lorena Baccaglini, Director, Clinical Research and Epidemiology Program, Center for Clinical Research, DER, presented the concept. The goals of the concept are to foster research that advances the integration of medically necessary oral, maxillofacial, and medical approaches to reduce DOC-related complications in oncology patients and cancer survivors, and to promote research that builds evidence to reduce coverage gaps in dental services linked to the clinical success of medical oncology services. There are many different types of DOC complications in oncology patients, and these conditions can themselves lead to further health concerns and additional medical care in addition to oncological treatments. This concept attempts to address the critical need to minimize these DOC complications while advancing the integration of necessary dental care into medical care and responds to interest on this topic from Congress and the Centers for Medicare and Medicaid Services (CMS). Potential topics for research studies in response to this initiative include monitoring and treatment of DOC complications of cancer patients and survivors with comorbidities, comparison of care coordination approaches, comparative safety and efficacy studies of novel oncologic therapies, and studies to test the efficacy of dental care protocols prior to or during chemotherapy to improve clinical guidelines, among other topics.

The Council's lead discussants for the concept were Drs. Nor and Moron-Concepcion. Dr. Nor said the concept is timely and has the potential to be highly impactful by preventing DOC complications and/or improving current approaches for management of existing complications. It could also produce additional evidence that demonstrates the importance of dental insurance coverage of cancer-related DOC treatments to improve quality of life. Dr. Nor suggested adding as an area of interest research on the effectiveness of dental health educational programs aimed at patients post-cancer-treatment. He also recommended including radiation therapy along with chemotherapy in the proposed areas of interest. Dr. Moron-Concepcion also expressed support. He suggested that the concept incorporate language indicating that it will support basic research that could provide mechanistic insights into how to improve dental treatment. He also recommended including a pain management component since many cancer patients are on pain medications which can impact oral health.

The Council unanimously approved the concept.



## Community-Engaged Research to Advance Oral Health Intervention Models for Racial/Ethnic Minority HIV/AIDS Populations

Dr. Hiroko Iida, Director, Oral Health Disparities and Inequities Research Program, DER, presented the concept, whose goal is "to support community-engaged research projects to enhance effectiveness and equity of HIV/AIDS and oral health intervention models for racial and ethnic minorities living with HIV/AIDS or at risk for acquiring HIV in the United States." Despite declining overall incidence rates, Black and Latino populations continue to be disproportionately affected by HIV/AIDS, and minority individuals living with HIV are least likely to receive care. Research has also shown that unmet dental care needs are more than twice as prevalent as unmet medical care needs in people living with HIV. This concept aligns with NIH's HIV/AIDS budget priorities and NIDCR Oral Health Disparities and Inequities Research Program's future initiative to establish community-based participatory research consortium for oral health equity. Potential areas of interest for this initiative include research that attempts to address structural racism and social determinants of health that impact oral health care access and/or outcomes, assessment of communication and engagement strategies, and studies to understand the barriers and facilitators of interventions, among other topics.

The Council's lead discussants for the concept were Drs. Krebsbach and Dickinson. Dr. Krebsbach said this concept addresses a difficult but important topic. He praised the concept for prioritizing community-engaged research, its holistic approach, and for the inclusion of social determinants of health as an area of interest. He advised NIDCR to develop metrics of success and impact for the program. Dr. Dickinson placed the concept in the historical context of the fight to eradicate HIV/AIDS and lauded the concept for focusing on the most vulnerable populations and calling for intersectional research approaches.

The Council unanimously approved the concept.

## Modulating the Microbiome Towards Health

Dr. Tamara McNealy, Director, Oral Microbiota and Bacterial Disease Program, DER, presented the concept. The goal of the initiative is to encourage efforts to develop microbiome-directed therapies for oral disease. Outcomes of successful projects might lead to novel therapeutic interventions that modulate the microbiome, reduce reliance on antimicrobials, and achieve longer-lasting improvements to oral health. While a great deal of research on the oral microbiome has been conducted over recent years, there have been limited attempts to translate this knowledge into therapeutics. Research on microbiome-directed therapies in the gut microbiome is further advanced and suggests four main therapeutic categories: diet and prebiotics, reconstitution with symbiotic bacterial consortia, the use of engineered microbiota, and the use of bioactive compound-derived microbiota. Research topics under this initiative might include community interactions, microbiota-directed complementary diets, small molecular therapeutics, and the integration of -omics approaches, among many others. Dr. McNealy noted that the heterogeneity of the oral microbiome suggests that personalized and targeted therapeutic approaches may hold the most promise of success.

The Council’s lead discussants for the concept were Drs. Koo and Nor. Dr. Koo expressed enthusiasm for the concept, emphasizing its potential impact and interdisciplinary approach. He noted some potential challenges to modulating the oral microbiome, such as the dynamic nature of the oral microbiome and the need to account for covariates and confounding factors. Dr. Koo also cautioned that -omics data without spatial or temporal information will have limited use. He suggested incorporating research on host factors and host-microbiome interactions into the concept. Dr. Nor agreed with Dr. Koo's comments and added that he thinks that this concept is extremely timely. He recommended that language related to oral cancer be added to the concept because there are established links between the oral microbiome and oropharyngeal cancer.

The Council unanimously approved the concept.

**CLOSED SESSION**

This portion of the meeting was closed to the public in accordance with the determination that it was concerned with matters exempt from mandatory disclosure under Sections 552b(c)(4) and 552b(c)(6), Title 5, U.S. Code and Section 1009(d) of the Federal Advisory Committee Act, as amended (5 U.S.C. §§ 1001-1014).

**XI. REVIEW OF APPLICATIONS**

**National Institute of Dental & Craniofacial Research**  
Council Applications Recommended for Further Consideration

September 11, 2024

.....

<b>Total</b>	<b>Requested</b>	<b>Approved</b>
<b>Number</b>	620	380
<b>Dollars</b>	\$ 221,588,964	\$ 136,048,078

.....

**XII. ADJOURNMENT**

**CERTIFICATION**

I hereby certify that the foregoing minutes are accurate and complete.

JENNIFER Y.  
WEBSTER-  
CYRIAQUE -S

Digitally signed by  
JENNIFER Y. WEBSTER-  
CYRIAQUE -S  
Date: 2024.12.02  
06:47:38 -05'00'

---

Dr. Jennifer Webster-Cyriaque  
Acting Chairperson  
National Advisory Dental and  
Craniofacial Research Council

Lynn M. King -S

Digitally signed by Lynn M. King  
-S  
Date: 2024.12.01 19:07:42 -05'00'

---

Dr. Lynn M. King  
Executive Secretary  
National Advisory Dental and  
Craniofacial Research Council