

Director's Report to the National Advisory Dental and Craniofacial Research Council

May 2019

ACTIVITIES OF THE NIDCR DIRECTOR AND DEPUTY DIRECTOR

Since the last meeting of the National Advisory Dental and Craniofacial Research Council on January 23, 2019, NIDCR Director Martha J. Somerman, DDS, PhD, and Deputy Director Douglas M. Sheeley, ScD, have maintained active schedules attending research symposia and workshops, delivering presentations to stakeholders, and meeting with leaders of other organizations. Among their notable activities during the last four months are the following:

Dr. Somerman, Dr. Sheeley, Lawrence Tabak, DDS, PhD, NIH principal deputy director, accompanied by NIDCR staff, attended the first meeting of the National Academies of Sciences, Engineering, and Medicine Committee on Temporomandibular Disorders on January 29 in Washington, DC. Drs. Somerman and Tabak delivered a charge to the committee to develop a consensus report on the condition.

Dr. Somerman and Karina Boehm, MPH, director of the NIDCR Office of Communications and Health Education, on February 1 presented a talk via videoconference to the American Dental Association (ADA) Council on Scientific Affairs titled "ADA-NIDCR Collaboration Agreement."

Dr. Sheeley attended the Salivary Glands and Exocrine Biology Gordon Research Conference, February 3-8 in Galveston, Texas.

Dr. Somerman, along with NIDCR executive staff, met with the Ad Hoc Group for Medical Research at the NIH campus in Bethesda, Md. on February 19 and provided an overview of NIDCR and several NIDCR research highlights.

Representatives from the Friends of NIDCR patient advocacy groups and the American Association for Dental Research (AADR) visited NIDCR on February 25. Dr. Somerman provided an overview of NIH and NIDCR oral health research and clinical studies in her presentation titled "NIDCR: Advancing Research and Bridging the Gap."

Dr. Somerman presented a talk titled "NIDCR: Catalyzing Oral Health Research and Innovation" at the AADR Advocacy Day on Capitol Hill on February 26 in Washington, DC. Later that day, Dr. Somerman attended a meeting of the National Academies of Sciences, Engineering, and Medicine Forum on Regenerative Medicine.

Dr. Sheeley attended the NIH Common Fund Glycoscience Informatics Project (GlyGen) Face to Face meeting on February 28 in Ashburn, Va.

Dr. Sheeley attended the Biophysical Society Annual Meeting March 4–6 in Baltimore.

Dr. Sheeley participated as a panelist in a workshop titled "Roundtable Discussion on Proteomics with NIH" at the US Human Proteome Organization Conference on March 4 in Bethesda, Md.

Dr. Somerman gave a presentation titled "NIDCR: Advancing Dental, Oral, and Craniofacial Research and Bridging the Gap" to the Council of Deans on March 16 at the 2019 American Dental Education Association (ADEA) Annual Session in Chicago.

Dr. Somerman gave a presentation titled "Tribal/Native Oral Health Research at NIDCR" at the NIH Tribal Advisory Committee Meeting on March 22 on the NIH campus in Bethesda, Md.

Dr. Sheeley organized a scientific session titled “Bringing Glycoproteomics Within Reach” to highlight techniques emerging from the NIH Common Fund Glycoscience Program on March 22 during the Association of Biomolecular Research Facilities Annual Meeting in San Antonio, Texas.

Dr. Somerman hosted an All-Hands meeting for NIDCR staff on March 27. At this meeting, the NIH Civil Program presented an overview of the NIH Anti-Harassment Program and associated policies and changes. In addition, NIDCR staff participated in an interactive discussion on proposed employee engagement activities.

Dr. Somerman attended the second meeting of the National Academies of Sciences, Engineering, and Medicine Committee on Temporomandibular Disorders, March 28-29 in Washington, DC.

Dr. Somerman presented a talk titled “NIDCR: Advancing Research on Pain Management and Combatting the Opioid Crisis” on April 3 as part of the ADA-NIH webinar, “The NIH Response to the Opioid Crisis from a Research Perspective.” Wilson Compton, MD, deputy director of the National Institute on Drug Abuse, and Brad Rindal, DDS, senior research investigator and associate dental director for research at HealthPartners Dental Group, also presented during the webinar.

Dr. Somerman presented a talk titled “NIDCR: Catalyzing Oral Health Research and Innovation and Bridging the Gap” at the ADEA Capitol Hill Day on April 11 in Washington, DC.

Dr. Sheeley, along with several NIDCR staff members, attended the Special Care Dentistry Association 31st Annual Meeting and helped organize a symposium co-sponsored by NIDCR and the Dr. Edward B. Shils Entrepreneurial Fund titled “NIDCR – Research in Special Care Dentistry” on April 12 in Atlanta. The goal of the symposium was to stimulate entrepreneurial research about oral health interventions for special needs communities.

Dr. Sheeley attended the workshop “Advancing Gene-Targeted Therapies for Central Nervous System Disorders,” hosted by the National Academies of Sciences, Engineering, and Medicine Forum on Neuroscience and Nervous Systems Disorders, on April 23 in Washington, DC.

Dr. Sheeley attended a National Cancer Institute Division of Cancer Prevention Think-Tank meeting, “Proteomic Cartography and Biomarkers at the Single-Cell Level: Interrogation of Premalignant and Early Stage Lesions” in Rockville, Md. on April 24.

Dr. Somerman attended the American Society of Gene & Cell Therapy 22nd Annual Meeting, April 29-30 in Washington, DC.

During the first quarter of 2019, Dr. Somerman served on the following committees:

- NIH Clinical Center Governing Board Working Group
- NIH Helping to End Addiction Long-term (HEAL) Initiative Executive Committee

During the first quarter of 2019, Dr. Sheeley served on the following committees:

- NIH Office of Biomedical Entrepreneurship and Innovation Director Search Committee
- NIH Center for Scientific Review Deputy Director Search Committee

BUDGET UPDATE

FY 2019

The FY 2019 enacted budget for NIDCR is \$461,781,000. This is an increase of \$15.098 million or 3.38% over FY 2018 final level.

FY 2020

The President's Budget Request would provide \$397,493,000 for NIDCR. The complete NIDCR budget justification is available via <https://www.nidcr.nih.gov/sites/default/files/2019-03/nidcr-congressional-justification-2020.pdf>

HHS/NIH UPDATE

NIH Director Testifies Before Congress on FY 2020 Budget Request

On April 2, NIH Director Francis S. Collins, MD, PhD, [appeared before the House](#) Appropriations Subcommittee on Labor, HHS, Education, and Related Agencies, and on April 11 he [appeared before the corresponding Senate](#) subcommittee. Dr. Collins discussed the FY 2020 President's Budget, which provides \$34.4 billion for NIH to fund the highest priority scientific discoveries while also maintaining fiscal stewardship of federal resources. He stated that the budget will prioritize biomedical research to confront our nation's greatest medical challenges, including the opioid crisis, precision medicine, and pediatric cancer.

Francis Collins Outlines Efforts to Address Sexual Harassment in Science

Dr. Collins issued an update on NIH's progress to address sexual harassment in science. In February, the [Working Group of the Advisory Council to the Director on Changing the Culture to End Sexual Harassment](#) met for the first time and heard from a wide range of experts and perspectives. The working group will report interim recommendations in June and provide a final report and recommendations to the Advisory Council to the Director in December 2019. Dr. Collins also described beginning steps being taken by NIH senior leadership, actions that include: demonstrating accountability and transparency to show the agency's serious commitment to addressing harassment; clarifying expectations for institutions and investigators to ensure a safe workplace and inform the agency; and listening to victims and survivors of sexual harassment and incorporating their perspectives into future actions.

NIH Reports on HEAL Initiative Progress

The NIH Helping to End Addiction Long-term (HEAL) Initiative is an aggressive, trans-agency effort to speed scientific solutions to stem the national opioid public health crisis. In March, Dr. Collins [announced the formation of the HEAL Partnership Committee](#), a group of experts that will help guide NIH research to develop new, non-addictive medications and technologies that reduce the need for opioids. In April, NIH [announced the selection of four research sites for the HEALing Communities Study](#) in states hard hit by the opioid crisis. More than \$350 million will support this multi-year study, which aims to reduce overdose deaths by testing a set of proven prevention and treatment interventions, such as distribution of naloxone to reverse overdose, and linking individuals in the criminal justice system with treatment for opioid addiction.

Two Decades of Data Reveal Overall Increase in Pain, Opioid Use among US Adults

Prompted by a call from the National Academy of Medicine, a recent study conducted by the National Center for Complementary and Integrative Health provides new insights concerning pain trends and opioid use for pain management. Data from the Medical Expenditure Panel Survey showed that the number of US adults age 18 and older suffering from at least one painful health condition increased substantially from 120.2 million (32.9%) in 1997/1998 to 178 million (41%) in 2013/2014. Furthermore, the use of strong opioids for pain management among adults with severe pain-related interference more than doubled from 4.1 million (11.5%) in 2001/2002 to 10.5 million (24.3%) in 2013/2014.

NIH Supports International Moratorium on Clinical Application of Germline Editing

Leading scientists and ethicists from seven countries [called for an international moratorium](#) on the use of genetic editing to modify the human germline for clinical purposes. The call came in the wake of research in China, in which a scientist claimed to have altered the DNA of two embryos that were subsequently implanted, and infant twins were born. Dr. Collins emphasized NIH's strong agreement with the moratorium. He and NIH Office of Science Policy Director Carrie Wolinetz, PhD, outlined the reasons for a moratorium and the need for international actions in a [correspondence to the journal Nature](#).

NIH Streamlines Gene Therapy Oversight and Charts a Course for Considering Emerging Technology

In August 2018, NIH and the Food and Drug Administration (FDA) [announced](#) a joint proposal to streamline duplicative and burdensome oversight over gene therapy. As part of this effort and following public input, in April 2019 NIH released the amended [NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules](#). The amendments remove the requirement to register and report on human gene therapy protocols under the *NIH Guidelines* to the NIH. Robust oversight continues under the FDA, which has regulatory oversight of all human gene therapy clinical trials.

Ending the HIV Epidemic: A Plan for America

In his State of the Union address February 4, President Donald J. Trump announced his public health initiative to end the HIV epidemic in America. The effort was described in detail in a February 7 *Journal of the American Medical Association* [editorial](#) by the directors of several US Department of Health and Human Services (HHS) agencies, including NIH's National Institute of Allergy and Infectious Diseases. The initiative aims to reduce incident infections in the US by 75% within 5 years, and then by 90% within 10 years. This effort will leverage critical scientific advances in HIV prevention, diagnosis, treatment, and care by coordinating the programs, resources, and infrastructure of the NIH and other HHS agencies.

Teens Use Vaping Devices in Record Numbers

Data from two surveys show that America's teens reported a significant increase in their use of vaping devices in 2018. According to the 2018 "Monitoring the Future" survey of a nationally representative sample of eighth, 10th, and 12th graders in schools nationwide, 37.3% of 12th graders reported "any vaping" in the past 12 months, compared to 27.8% in 2017. The annual survey, led by University of Michigan scientists, is funded by NIH's National Institute on Drug Abuse. [Data](#) from the Centers for Disease Control and Prevention and the FDA's National Youth Tobacco Survey showed that more than 3.6 million middle and high school students had used e-cigarettes within the previous month, an increase of more than 1.5 million students since 2017. Surgeon General Jerome M. Adams MD, MPH, subsequently [issued an advisory](#) stressing the importance of addressing youth e-cigarette use, citing the adverse effects of nicotine addiction and its associated health risks.

NIH Director Charges Working Group to Explore Artificial Intelligence

In February, President Trump signed an executive order launching the American Artificial Intelligence (AI) Initiative, which will focus federal government resources to develop AI to increase our nation's prosperity, security, and quality of life for Americans. Dr. Collins charged the Working Group on AI within the NIH Advisory Council to the Director to determine opportunities for innovative cross-NIH efforts in AI; identify mechanisms for NIH; build connections and collaborations among computer and data science communities and the biomedical research communities; define approaches to encourage computer scientists to work in the biomedical field; and identify major ethical considerations as they relate to biomedicine using AI and related technologies for health-related research.

ORWH Releases Trans-NIH Strategic Plan for Women's Health Research

The NIH Office of Research on Women's Health recently released its 2019-2023 strategic plan. The five-year plan is a multipronged pathway to advance a vision in which sex and gender influences are integrated into the biomedical research enterprise; every woman receives evidence-based disease prevention and treatment tailored to her own needs, circumstances, and goals; and women in science careers reach their full potential.

NIMHD Outlines Research Strategies to Address Health Disparities

In an *American Journal of Public Health* special issue, National Institute on Minority Health and Health Disparities (NIMHD) staff and other experts within and outside NIH, including NIDCR, outline research strategies to improve minority health and reduce health disparities. The special issue is the culmination of an NIH-wide, two-year science visioning process led by NIMHD to determine the science needed to address health disparities. Melissa Riddle, PhD, in NIDCR's Division of Extramural Research (DER), participated in the process by serving on a trans-NIH advisory group, helping to plan a workshop to seek expert recommendations, and contributing to a statement paper summarizing workshop recommendations and a vision for the future. Darien Weatherspoon, DDS, MPH, from NIDCR DER and

Sue Hamann, PhD, from the NIDCR Office of Science Policy and Analysis, also contributed to this process. The strategies will guide the implementation of the NIH Strategic Plan on Minority Health and Health Disparities for the next five years.

NIH ODP Releases 2019-2023 Strategic Plan

The NIH Office of Disease Prevention (ODP) recently released its 2019-2023 strategic plan, which includes six strategic priorities to guide ODP activities over the next five years. Three cross-cutting themes represent areas of opportunity for the ODP to develop new activities and better integrate disease prevention into trans-NIH initiatives. The themes are: causes and risk factors for premature morbidity and mortality, health disparities, and dissemination and implementation research.

NIH Greatly Expands Investment in BRAIN Initiative

NIH announced funding of more than 200 new awards, totaling over \$220 million, through the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative, which is a trans-agency effort to arm researchers with revolutionary tools to understand the neural circuits that underlie the healthy and diseased brain. NIH is leveraging several BRAIN Initiative advances to help tackle the pain and opioid crisis. BRAIN is part of the 21st Century Cures Act, and the new awards bring 2018 support for the program to more than \$400 million, which is 50% more than the amount spent in 2017.

New Fellowship Program Will Bring African Scientists To Train at NIH

The [African Postdoctoral Training Initiative](#), a collaboration of NIH, the African Academy of Sciences, and the Bill and Melinda Gates Foundation, is a new NIH fellowship program that aims to prepare future generations of African researchers while establishing ongoing scientific partnerships between NIH labs and African investigators and institutions. Ten fellows chosen for the inaugural cohort will assume their NIH positions by early 2019 and another cohort is expected to be recruited in 2020.

NIH, Amgen Foundation, and FNIH Renew Support for Undergraduate Research Opportunities

A program at NIH to provide hands-on laboratory experience to undergraduate students from across the United States will continue for another four years, thanks to a grant from the Amgen Foundation to the Foundation for the National Institutes of Health. The Amgen Scholars Program at NIH aims to break down barriers for many students who otherwise would not have the opportunity to engage in science at the world's top educational and research institutions.

Debara Tucci Named Director of NIDCD

Dr. Collins selected Debara L. Tucci, MD, MS, MBA, to lead the National Institute on Deafness and Other Communication Disorders as its new director. Dr. Tucci currently is professor of surgery and director of the cochlear implant program in the Division of Head and Neck Surgery & Communication Sciences at Duke University, Durham, N.C. She is expected to join NIH on September 3, 2019.

Noni Byrnes Named Director of the Center for Scientific Review

Noni H. Byrnes, PhD, became the director of the NIH Center for Scientific Review (CSR) on February 17. Byrnes has served as acting director of CSR since the retirement of former director Richard Nakamura, PhD, in May 2018. Byrnes has worked at CSR since 2000, when she started as a scientific review officer. Prior to joining NIH, Byrnes worked in the pharmaceutical industry. She earned her bachelor's degree in chemistry from Allegheny College and her PhD in analytical chemistry from Emory University.

NIDCR UPDATE

Institute News

2020 Surgeon General's Report on Oral Health

In April, NIDCR's Bruce Dye, DDS, MPH, and Judith Albino, PhD, met with US Surgeon General Jerome M. Adams MD, MPH, to present the framework and progress updates for the 2020 Surgeon General's Report on Oral Health, now in development. NIDCR is working closely with the Office of Surgeon General to produce the report. Through frequent public engagements, Drs. Dye and Albino continue to provide

updates and seek input from stakeholders in the oral health community. These efforts include presentations at the National Oral Health Conference in Memphis on April 17, the Santa Fe Group's "Salon on Comprehensive Health Without Oral Health: The Medicare Paradox," in Arlington, Va. on May 9, as well as the upcoming International Association for Dental Research General Session, National Dental Association Annual Convention, American Dental Association Annual Meeting, and the American Public Health Association Annual Meeting in the summer and fall. The report, expected to be released in late 2020, will document progress and challenges impacting oral health since 2000, when the landmark Surgeon General's report, "Oral Health in America" was published.

NIDCR Hosts Craniofacial Research Symposium

NIDCR hosted a symposium, "Looking Back and Facing the Future: From NIDR to NIDCR, A Craniofacial Research Symposium" on May 6 on the NIH campus in Bethesda, Md. The event showcased research accomplishments in craniofacial biology and commemorated the addition in 1998 of "Craniofacial" to the Institute's name. Two former NIDCR directors, Lawrence Tabak, DDS, PhD, and Harold Slavkin, DDS, as well as current director, Martha Somerman, DDS, PhD, delivered talks at the event. The symposium included presentations on craniofacial development and regeneration, wound healing, salivary gland development and regeneration, periodontal disease, and bone metabolism. [A videocast of the event](#) is available.

National Academies Launches Consensus Study on TMD

On January 29, NIH Principal Deputy Director Dr. Tabak, and NIDCR Director Dr. Somerman, accompanied by NIDCR staff, delivered a charge to the National Academies of Sciences, Engineering, and Medicine Committee on Temporomandibular Disorders to develop a consensus report on the condition. The expert committee will assess the current state of knowledge about temporomandibular disorders (TMD), safety and efficacy of treatments, and burden and costs associated with TMD. The report will provide recommendations for enhancing research, training, and education to enable development of effective, evidence-based therapies. On March 28-29, the National Academies hosted a [second meeting](#), a portion of which was open to the public.

Patient Advocacy Organizations Visit NIDCR

On February 25, NIDCR hosted representatives from the Friends of NIDCR Patient Advocacy Council, an umbrella group comprising non-profit organizations that work together to advance dental, oral, and craniofacial health research and to move that research from the lab to the clinic. The meeting included presentations from NIDCR senior staff and a tour of two NIDCR intramural research labs and the NIH Dental Clinic. The visit aimed to foster an ongoing conversation around patient needs and research advances, gaps, and opportunities.

Personnel Update

Kenneth Yamada Receives BSMB Gold Medal

Kenneth M. Yamada, MD, PhD, chief of the Cell Biology Section of the Division of Intramural Research (DIR) was awarded the inaugural gold medal of the British Society for Matrix Biology "in recognition of outstanding contributions to Matrix Biology." He presented the BSMB Medal Lecture at The University of Liverpool during a joint meeting in April of the BSMB and Matrix Biology Ireland.

Roxanne Tussiwand joins NIDCR as Stadtman Investigator

Roxanne Tussiwand, PhD, joined the DIR as a new Stadtman Investigator. She was sponsored by the Italian government to pursue her PhD in molecular medicine at the Institute for Research in Biomedicine in Bellinzona, Switzerland, where she studied dendritic cell development. Following a postdoctoral fellowship with Antonius G. Rolink, PhD, at the University of Basel, she joined the lab of Kenneth Murphy, MD, PhD, at Washington University, where she investigated transcriptional regulation of dendritic cell development. In 2014, Dr. Tussiwand became an assistant professor at the University of Basel in Switzerland.

Meetings and Conferences

Staff Presentations

Pamela G. Robey, PhD, chief of the Skeletal Biology Section, DIR, was selected as a keynote speaker and mentor for the Third Herbert Fleisch Workshop, sponsored by the International Federation of Musculoskeletal Research Societies. The workshop was held from March 17-19 in Brugge, Belgium.

Kelly Ten Hagen, PhD, chief of the Developmental Glycobiology Section, DIR, was the Experimental Biology/American Society for Biochemistry and Molecular Biology 2019 Speaker and Discussion Leader at the Women's Networking Event in Orlando, Fla. Her presentation was titled "Addressing the Culture Within the NIH: The NIH Anti-Harassment Program."

Preethi Chander, PhD, director of the Salivary Biology and Immunology Program, Division of Extramural Research (DER), presented a talk, "Human Salivary Proteome Wiki," and a poster on NIDCR's support for salivary biology and oral immunology research at the Gordon Research Conference in Salivary Gland and Exocrine Biology, held February 2-7 in Galveston, Texas.

Orlando Lopez, PhD, director of the Dental Materials and Biomaterials Program, DER, attended the 2019 Interagency Modeling and Analysis Group Annual Meeting on March 6-7, held on the NIH campus in Bethesda, Md. Dr. Lopez served as co-organizer and moderator for the breakout session, "Modeling Repositories."

Dawn Morales, PhD, health specialist in the Behavioral Sciences and Social Services Research Branch, DER, co-presented with William Elwood, PhD (NIH Office of Behavioral and Social Sciences Research (OBSSR)), Christine Hunter, PhD (OBSSR), and Catherine Stoney, PhD (National Heart, Lung, and Blood Institute) a talk titled "NIH Clinical Trials Update: Delayed Enforcement, Short-term Flexibilities, and Social-behavioral Protocol Templates," at the 40th Annual Meeting of the Society for Behavioral Medicine held March 6-9 in Washington, DC.

Dr. Morales co-presented with Kirk Baker, PhD, a talk titled "Behavioral Ontology of Resilience: Descriptive mapping of co-occurrences of constructs and tasks using NLP," at the Resilience Grantees and Ontology Development Workshop held on March 6 on the NIH campus in Bethesda, Md.

Chiayeng Wang, PhD, director of the Oral and Salivary Gland Cancer Biology Program, DER, organized chaired, and moderated sessions at the first face-to face kickoff meeting of the Cancer Moonshot Immuno-Oncology Translational Network, held March 27-28 in Bethesda, Md. She also organized an inter-agency workshop on innovations in risk-stratification and treatment of veterans with oropharynx cancer, co-sponsored by the US Department of Veterans Affairs and NIDCR, held May 9-10 at the Baylor College of Medicine in Houston.

Dr. Wang gave a talk at the National Cancer Institute-sponsored session, "Funding Opportunities for Cancer Research at Multiple NIH Institutes and Centers," during the American Association for Cancer Research (AACR) meeting March 29-April 3 in Atlanta.

Dr. Wang spoke at the grant-writing session of AACR-American Head and Neck Society Head and Neck Cancer Conference: Optimizing Survival and Quality of Life through Basic, Clinical, and Translational Research on April 30 in Austin, Texas.

Darien Weatherspoon, DDS, MPH, director of the Health Disparities Research Program, DER, presented a talk titled "Federal Dental Careers Overview" to the American Association of Public Health Dentistry Student Chapter on March 28 at the University of Maryland School of Dentistry in Baltimore.

Dr. Weatherspoon gave a presentation titled "NIDCR Health Disparities Research and Available Resources" at the National Organization Roundtable, 2019 National Oral Health Conference held on April 16 in Memphis, Tenn.

Dr. Weatherspoon presented “Aging Research Initiatives at NIH” at the Aging and Health Symposium held on May 21 at the University of Illinois at Chicago.

Yolanda Vallejo, PhD, director of the Neuroscience of Orofacial Pain and Temporomandibular Disorders Program, DER, presented a talk titled “Temporomandibular Disorders (TMD): From Research Discoveries to Clinical Treatment” at a workshop at the National Academies of Sciences, Engineering, and Medicine’s Health and Medicine Division, March 28-29 in Washington, DC.

DER staff, including Dena Fischer, DDS, MSD, MS, acting director of the Center for Clinical Research; Melissa Riddle, PhD, director of the Behavioral and Social Sciences Research Branch; and Dwayne Lunsford, PhD, director of the Microbiology Program and coordinator of the NIDCR Small Business Innovation Research/Small Business Technology Transfer Research Program, organized and presented at the “Research and Entrepreneurship in Special Care Dentistry” session at the 31st Annual Meeting of the Special Care Dentistry Association on April 12 in Atlanta.

Nicole García-Quijano, MD, MPH, from the Office of Communications and Health Education, presented a poster titled “Oral Health Information for Caregivers of Older Adults,” at the 2019 National Oral Health Conference on April 15 in Memphis, Tenn.

Jason Wan, PhD, director of the Mineralized Tissues Physiology Program, DER, presented a talk titled “NIDCR Funding Opportunities for Research and Research Training” at the American Association of Orthodontists Annual Session, May 3-7 in Los Angeles. Dr. Wan also talked with grantees and potential applicants and presided at the NIDCR outreach table during the meeting’s exhibition hours to conduct further outreach to clinicians and investigators.

Staff Attendance

NIDCR Division of Extramural Research staff attended the following meetings:

- Keystone Symposia: Digital Health: From Science to Application, held January 21-25 in Keystone, Colo.
- National Academies of Sciences, Engineering, and Medicine’s Health and Medicine Division First Meeting of the Committee on Temporomandibular Disorders (TMD): From Research Discoveries to Clinical Treatment, held on January 29 in Washington, DC.
- NIH Workshop: A Critical Evaluation of Animal Pain Models, held January 30-31 in Rockville, Md.
- Orthopedic Research Society, held February 2-5 in Austin, Texas
- Department of Defense Working Group on Computational Modeling on Blast Related Threats held February 5-7 at the MITRE Corporation in McLean, Va.
- NIH Workshop: The Opioid Crisis and the Future of Addiction and Pain Therapeutics: Opportunities, Tools, and Technologies Symposium, held February 7-8, in Bethesda, Md.
- The National Dental Practice Based Research Network Annual Regional Meetings of practitioner members: Southwest Region’s Annual Meeting, held February 21-22 in San Antonio, Texas; the Midwest Region’s Annual Meeting, held March 1-2 in Minneapolis, and the South Central and South Atlantic Regions’ Joint Annual Meeting, held March 8-9 in Birmingham, Ala.
- National Academy of Medicine Regenerative Medicine Forum Members Meeting held on February 26 in Washington, DC.
- NIH Rare Disease Day, held on February 28 at NIH in Bethesda, Md.
- 15th Annual US HUPO Conference, held March 3-6 in Rockville, Md.
- Conference on Retroviruses and Opportunistic Infections, held March 4-7 in Seattle.
- Society for Behavioral Medicine, held March 6-9 in Washington, DC.
- NIH Tissue Chip Consortium, held March 11-12 in Rockville, Md.
- JAX Symposium: Improving the Translational Relevance of Preclinical Data-Immune Biomarkers for Drug Discovery, held on March 13 in Rockville, Md.

- Academy of Osseointegration, held March 13-16 in Washington, DC.
- 2019 Frontiers in Medical Devices Conference hosted by the BMES Biomedical Engineering Society, held March 19-21 in College Park, Md.
- Washington DC Commercialization Accelerator Program meeting, on March 21 in Washington, DC.
- Retreat and Workshop on Inflammation Resolution Biology, held March 25-26 in Research Triangle Park, N.C.
- American Council for Technology-Industry Advisory Council Healthcare Blockchain Forum held on March 28 in Washington, DC.
- NIH Workshop on Trustworthy Data Repositories for Biomedical Sciences, held on April 8 at NIH in Bethesda, Md.
- University of Pittsburgh Medical Center Hillman Cancer Center Viral Oncology Symposium, held on April 15 in Pittsburgh.
- Society for Biomaterials 2019 Annual Meeting, held April 2-6 in Seattle.
- The Pediatric HIV/AIDS Cohort Study networking meeting, held on April 8 in Bethesda, Md.
- 2019 Cancer Autoimmunity and Immunology Symposium, held April 15-16 in Bethesda, Md.
- NIH-American Association of Cancer Research Cancer, Autoimmunity, and Immunology Conference, held April 15-16 in Bethesda, Md.
- Angel Capital Association Summit, held April 23-26 in Chicago.
- 16th Annual World Health Care Congress, held on May 1 in Washington, DC.
- Methods for Assessing the Impact of Screening in Childhood on Health Outcomes workshop, held May 9-10 in Bethesda, Md.

Jonathan Horsford, PhD, acting director of the Office of Science Policy and Analysis, attended the 2019 American Dental Education Association annual meeting, March 16-19 in Chicago, and participated in the Student Diversity Leadership Program for emerging student leaders from diverse backgrounds who have an interest in issues related to diverse communities.

Intramural Training Activities and Outreach

NIH Grant-Writing Course

The NIDCR Office of Education continues to provide support for career development of our postdoctoral community. Four NIDCR trainees have signed up to participate in a grant-writing course in May titled “NIH Grant Writing Course - An In-Depth Workshop.” This five-part course is hosted in collaboration with the National Human Genome Research Institute, *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, and National Institute of Arthritis and Musculoskeletal and Skin Diseases. To teach participants about the key aspects of a successful application, the workshop gives participants the opportunity to write a rough draft of an NIH grant using their own data, to take part in an NIH grant mock study section, and to go through the process of scoring real NIH grants that have been previously reviewed.

2019 NIDCR Fellows' Scientific Training

The NIDCR Office of Education remains vigilant in its mission to enrich the training and career development of our predoctoral and postdoctoral trainees. This year, the Fellows' Scientific Training was held April 4 in Washington, DC. One hundred and two graduate students, predoctoral Intramural Research Training Award fellows, postdoctoral trainees, clinical fellows, staff scientists, and biologists attended along with the Division of Intramural Research scientific director and Office of Education staff. Activities at the event included: a keynote address by Billy Hudson, PhD, research investigator at Vanderbilt University Medical Center, NIDCR new investigator spotlight, four fifteen-minute oral presentations by attendees, six three-minute-talk/open mic oral presentations, two attendee poster sessions, and career-focused roundtable discussions. Laura Kerosuo Pahlberg, PhD, gave this year's

NIDCR new investigator spotlight presentation.

Recruitment and Educational Events

To continue exposing potential trainees to the resources available at NIDCR, Deborah Philp, PhD, intramural training director at NIDCR, attended the Hispanic Dental Association/National Hispanic Medical Association conference held in April in Arlington, Va. She attended conference sessions and disseminated training program information at the NIDCR exhibit booth to all participants interested in learning more about training programs at NIDCR.

2019 NIDCR Summer Dental Student Award

The Office of Education continues its recruitment efforts for students interested in oral health training opportunities. This year, eight dental students from across the country were selected to receive the 2019 NIDCR Summer Dental Student Award.

Research Training and Career Development Branch, Division of Extramural Activities

The NIDCR Research Training and Career Development Branch staff members reach out to the community via conferences, meetings, and workshops. Activities are created to encourage predoctoral students, postdoctoral fellows, and junior investigators to apply for NIDCR individual research training and career development awards; to disseminate information on research training opportunities; to engage investigators as potential research mentors; and to develop research training programs that are responsive to the research training and career development needs of the extramural research workforce.

Leslie Frieden, PhD, and Lynn King, PhD, presented a webinar to provide information about NIDCR Individual Mentored Fellowship (F) Awards on February 28. This webinar provided programmatic, peer review, and award information on individual fellowships to support dual degree dentist-PhD (F30), graduate student (F31) and postdoctoral (F32) trainees pursuing mentored research training in dental, oral, and craniofacial research.

Highlights of Trainee Scientific Achievements

Trainees Who Have Achieved Subsequent NIH Grants

First R01s/U01s

- Cuong Nguyen, PhD, former NIDCR K99/R00 awardee, Assistant Professor, Department of Infectious Diseases and Pathology, University of Florida. (NIDCR) R01, "Mapping the T cell receptor/antigen complex and identifying the genetic-based treatment in Sjogren's syndrome."
- Jennifer Totonchy, PhD, current NIDCR K99/R00 awardee, Assistant Professor, Department of Biomedical and Pharmaceutical Sciences, Chapman University. (NCI) R01, "Identifying susceptibility factors for KSHV infection in human tonsil."
- Hu Zhao, DDS, PhD, current NIDCR K08 awardee, Assistant Professor, Department of Restorative Sciences, Texas A&M University. (NIDCR) R01, "Regulating niche of periodontium mesenchymal stem cells under the physiological condition."

Pathway to Independence Awards (K99/R00); transitions to tenure track research faculty position (R00 phase)

- Chider Chen, PhD, Assistant Professor, Department of Oral and Maxillofacial Surgery and Pharmacology, University of Pennsylvania. R00: "FAS Controls Exosome-Mediated miRNA Transfer in MSC-Based Therapy."

- Jimmy Hu, PhD, Assistant Professor, Division of Oral Biology & Medicine, University of California Los Angeles. R00: “An investigation of the roles of mechanical signaling in YAP-mediated tooth renew.”

Transitions from Institutional Training Grant Support (T32/T90/R90) to Individual Awards

NIDCR strongly encourages trainees supported on institutional training grants to apply for and transition to individual fellowships or career development award support.

- Michael Baldwin, University of Washington. NIDCR F30 fellowship to support predoctoral dual degree DDS-PhD training. “Causes and Consequences of Midfacial Hypoplasia in the Yucatan Minipig.”
- Elizabeth Guirado, University of Illinois, Chicago. NIDCR F30 fellowship to support predoctoral dual degree DMD-PhD training. “Roles of the Phosphate-regulating Proteins, PHEX and DMP1, in the Dentin Matrix of XLH Patients.”
- Kevin Rivera, University of California San Francisco. NIDCR diversity F31 fellowship to support predoctoral PhD training. “Local Delivery of Neurogenic Factors via Polymeric Microparticles for Enhanced Endochondral Bone Repair in the Mandible.”
- Genevieve Romanowicz, University of Michigan. NIDCR F30 fellowship to support predoctoral dual degree DDS-PhD training. “The role of collagen cross-links in craniofacial bone quality and healing.”

Recent Publications from Trainees

F Fellows

Bennett KG, Kelley BP, Vick AD, Lee JS, Gunaseelan V, Brummett CM, Waljee JF. [Persistent Opioid Use and High-Risk Prescribing in Body Contouring Patients.](#) *Plast Reconstr Surg.* 2019 Jan;143(1):87-96.

Chang NN, Abdelaziz M, Fried D. [The Relationship of Dehydration Rate and Transparent Surface Layer Thickness for Coronal Lesions on Extracted Teeth.](#) *Proc SPIE Int Soc Opt Eng.* 2019 Feb;10857.

Coombs MC, Bonthius DJ, Nie X, Lecholop MK, Steed MB, Yao H. [Effect of Measurement Technique on TMJ Mandibular Condyle and Articular Disc Morphometry: CBCT, MRI, and Physical Measurements.](#) *J Oral Maxillofac Surg.* 2019 Jan;77(1):42-53.

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Hadaya D, Soundia A, Gkouveris I, Dry SM, Aghaloo TL, Tetradis S. [Development of Medication-Related Osteonecrosis of the Jaw After Extraction of Teeth With Experimental Periapical Disease.](#) *J Oral Maxillofac Surg.* 2019 Jan;77(1):71-86.

Hutchins EJ, Bronner ME. [Draxin alters laminin organization during basement membrane remodeling to control cranial neural crest EMT.](#) *Dev Biol.* 2019 Feb 15;446(2):151-158.

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Merkel A, George A. [In Vitro Analysis of Intramolecular Signaling Events in PDLSCs Using Confocal and TIRF Microscopy](#). *Methods Mol Biol*. 2019;1922:103-110.

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Pensa NW, Curry AS, Reddy MS, Bellis SL. [The addition of a polyglutamate domain to the angiogenic QK peptide improves peptide coupling to bone graft materials leading to enhanced endothelial cell activation](#). *PLoS One*. 2019 Mar 11;14(3):e0213592.

Rainey K, Michalek SM, Wen ZT, Wu H. [Glycosyltransferase-Mediated Biofilm Matrix Dynamics and Virulence of *Streptococcus mutans*](#). *Appl Environ Microbiol*. 2019 Feb 20;85(5).

Sawicki CM, Kim JK, Weber MD, Faw TD, McKim DB, Madalena KM, Lerch JK, Basso DM, Humeidan ML, Godbout JP, Sheridan JF. [Microglia Promote Increased Pain Behavior through Enhanced Inflammation in the Spinal Cord during Repeated Social Defeat Stress](#). *J Neurosci*. 2019 Feb 13;39(7):1139-1149.

Vermilyea DM, Ottenberg GK, Davey ME. [Citruination mediated by PPAD constrains biofilm formation in *P. gingivalis* strain 381](#). *NPJ Biofilms Microbiomes*. 2019 Feb 7;5:7.

Wee Y, Moore AN, Jia S, Zhou J, Colombo JS, D'Souza RN. [A Single-Step Self-Assembly Approach for the Fabrication of Aligned and Multilayered Three-Dimensional Tissue Constructs Using Multidomain Peptide Hydrogel](#). *SLAS Technol*. 2019 Feb;24(1):55-65.

Institutional Training Grant (/T32/T90/R90) Trainees and KL2 Scholars

Hathaway-Schrader JD, Steinkamp HM, Chavez MB, Poulides NA, Kirkpatrick JE, Chew ME, Huang E, Alekseyenko AV, Aguirre JI, Novince CM. [Antibiotic Perturbation of Gut Microbiota Dysregulates Osteoimmune Cross Talk in Postpubertal Skeletal Development](#). *Am J Pathol*. 2019 Feb;189(2):370-390.

Hrdlicka HC, Lee SK, Delany AM. [MicroRNAs are Critical Regulators of Osteoclast Differentiation](#). *Curr Mol Biol Rep*. 2019 Feb;5(1):65-74.

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Moussa DG, Fok A, Aparicio C. [Hydrophobic and antimicrobial dentin: A peptide-based 2-tier protective system for dental resin composite restorations](#). *Acta Biomater*. 2019 Apr 1;88:251-265.

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K Awardees

Andriankaja OM, Muñoz-Torres FJ, Vergara JL, Pérez CM, Joshipura K. [Utility of point-of-care vs reference laboratory testing for the evaluation of glucose levels](#). *Diabet Med*. 2019 May;36(5):626-632.

Chung NN, Ransom RC, Blackshear CP, Irizarry DM, Yen D, Momeni A, Lee GK, Nguyen DH, Longaker MT, **Wan DC**. [Fat Grafting into Younger Recipients Improves Volume Retention in an Animal Model](#). *Plast Reconstr Surg*. 2019 Apr;143(4):1067-1075.

Feitosa SA, Palasuk J, Geraldini S, Windsor LJ, **Bottino MC**. [Physicochemical and biological properties of novel chlorhexidine-loaded nanotube-modified dentin adhesive](#). *J Biomed Mater Res B Appl Biomater*. 2019 Apr;107(3):868-875.

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Ow TJ, Fulcher CD, et. al. [Optimal targeting of BCL-family proteins in head and neck squamous cell carcinoma requires inhibition of both BCL-xL and MCL-1](#). *Oncotarget*. 2019 Jan 11;10(4):494-510.

Samstein RM, Lee CH, [...] **Morris LGT**. [Tumor mutational load predicts survival after immunotherapy across multiple cancer types](#). *Nat Genet*. 2019 Feb;51(2):202-206.

Sitzman TJ, Carle AC, Heaton PC, Helmroth MA, Britto MT. [Five-Fold Variation Among Surgeons and Hospitals in the Use of Secondary Palate Surgery](#). *Cleft Palate Craniofac J*. 2019 May;56(5):586-594.

Zeng Y, Nikitkova A, Abdelsalam H, Li J, **Xiao J**. [Activity of quercetin and kaempferol against Streptococcus mutans biofilm](#). *Arch Oral Biol*. 2019 Feb;98:9-16.

PUBLICATIONS

Selected Extramurally Funded Science Advances

During the past four months, 322 extramurally funded studies were published in the scientific literature. Below is a list of the most important papers published from each program area.

High-Impact Findings from Seasoned Investigators

Behavioral and Social Sciences Research

Nelson S, Milgrom P, Albert JM, et al. [Randomized Trial Based on the Common-Sense Model of Self-regulation to Increase Child Dental Visits](#). *JDR Clin Trans Res*. 2019; 2380084419830662.

Nelson S, Albert JM, Liu Y, et al. [The psychometric properties of a new oral health illness perception measure for adults aged 62 years and older](#). *PLoS ONE*. 2019;14(4):e0214082.

Stein Duker LI, Floríndez LI, Como DH, et al. [Strategies for Success: A Qualitative Study of Caregiver and Dentist Approaches to Improving Oral Care for Children with Autism](#). *Pediatr Dent*. 2019;41(1):4E-12E.

Center for Clinical Research

Rindal DB, Gilbert G, Carcelén C, Funkhouser E, Durand E, Uppgaard DA, Fellows J, Ikeda J, Kerr AR, Brar B, Gordan VV, Agarwal S, Barnett P, Pickard RK, Gillison M. [Feasibility and acceptance of oral human papillomavirus detection in the dental office](#). National Dental Practice-Based Research Network. *J Am Dent Assoc*. 2019 Feb;150(2):130-139.e4.

Martin M, Rosales G, Sandoval A, Lee H, Pugach O, Avenetti D, Alvarez G, Diaz A. [What really happens in the home: a comparison of parent-reported and observed tooth brushing behaviors for young children.](#) *BMC Oral Health*. 2019 Feb 21; 19(1):35.

Hutcheson KA, Nurgalieva Z, Zhao H, Gunn GB, Giordano SH, Bhayani MK, Lewin JS, Lewis CM. [Two-year prevalence of dysphagia and related outcomes in head and neck cancer survivors: An updated SEER-Medicare analysis.](#) *Head Neck*. 2019 Feb;41(2): 479-487.

Momeni SS, Ghazal T, Grenett H, Whiddon J, Moser SA, Childers NK. [Streptococcus mutans serotypes and collagen-binding proteins Cnm/Cbm in children with caries analysed by PCR.](#) *Mol Oral Microbiol*. 2019 Apr;34(2):64-73.

Marshall TA, Curtis AM, Cavanaugh JE, Warren JJ, Levy SM. [Child and Adolescent Sugar-Sweetened Beverage Intakes Are Longitudinally Associated with Higher Body Mass Index z Scores in a Birth Cohort Followed 17 Years.](#) *J Acad Nutr Diet*. 2019 Mar;119(3):425-434.

Slade GD, Grider WB, Maas WR, Sanders AE. [Water Fluoridation and Dental Caries in U.S. Children and Adolescents.](#) *J Dent Res*. 2018 Sep;97(10):1122-1128.

Curiel JA, Slade GD, Christian TL, Lafferty-Hess S, Carsey TM, Sanders AE. [Referendum opposition to fluoridation and health literacy: a cross-sectional analysis conducted in three large US cities.](#) *BMJ Open*. 2019 Feb 1;9(2):e022580

Brega AG, Henderson WG, Harper MM, Thomas JF, Manson SM, Batliner TS, Braun PA, Quissell DO, Wilson A, Tiwari T, Albino J. [Association of Ethnic Identity with Oral Health Knowledge, Attitudes, Behavior, and Outcomes on the Navajo Nation.](#) *J Health Care Poor Underserved*. 2019; 30(1):143-160.

Geiger CK, Kranz AM, Dick AW, Duffy E, Sorbero M, Stein BD. [Delivery of Preventive Oral Health Services by Rurality: A Cross-Sectional Analysis.](#) *J Rural Health*. 2019 Jan;35(1):3-11.

Collins PL, Cella M, Porter SI, Li S, Gurewitz GL, Hong HS, Johnson RP, Oltz EM, Colonna M. [Gene regulatory programs conferring phenotypic identities to human NK cells.](#) *Cell*. 2019 Jan 10;176(1-2):348-360.e12.

Jones AT, Shen X, Walter KL, LaBranche CC, Wyatt LS, Tomaras GD, Montefiori DC, Moss B, Barouch DH, Clements JD, Kozlowski PA, Varadarajan R, Amara RR. [HIV-1 vaccination by needle-free oral injection induces strong mucosal immunity and protects against SHIV challenge.](#) *Nat Commun*. 2019 Feb 18;10(1):798.

Curtis AD 2nd, Walter KA, Nabi R, Jensen K, Dwivedi A, Pollara J, Ferrari G, Van Rompay KKA, Amara RR, Kozlowski PA, De Paris K. [Oral coadministration of an intramuscular DNA/Modified Vaccinia Ankara Vaccine for Simian Immunodeficiency Virus is associated with better control of infection in orally exposed infant macaques.](#) *AIDS Res Hum Retroviruses*. 2019 Mar;35(3):310-325.

Integrative Biology and Infectious Diseases

Salvatori O, Pathirana RU, Kay JG, Edgerton M. [Candida albicans Ras1 inactivation increases resistance to phagosomal killing by human neutrophils.](#) *Infect Immun*. 2018. 86:e00685-18.

Godovikova V, Goetting-Minesky MP, Timm JC, Fenno JC. [Immunotopological analysis of the Treponema denticola major surface protein \(Msp\).](#) *J Bacteriol*. 2019 201:e00528-18.

Sambandam V, Frederick MJ, Shen L, Tong P, Rao X, Peng S, Singh R, Mazumdar T, Huang C, Li Q, Pickering CR, Myers JN, Wang J, and Johnson FM. [PDK1 mediates NOTCH1-mutated head and neck](#)

[squamous carcinoma vulnerability to therapeutic PI3K/mTOR inhibition](#) *Clinical Cancer Research*. 2019 Feb 15.

Jokisaari JR, Wang C, Qiao Q, Hu X, Reed DA, Bleher R, Luan X, Klie RF, Diekwisch TGH. [Particle-Attachment-Mediated and Matrix/Lattice-Guided Enamel Apatite Crystal Growth](#). *ACS Nano*. 2019 Feb 25.

Su J, Kegulian NC, Bapat RA, Moradian-Oldak J. [Ameloblastin Binds to Phospholipid Bilayers via a Helix-Forming Motif within the Sequence Encoded by Exon 5](#). *ACS Omega*. 2019. 4 (2), 4405-4416.

Takahashi A, Nagata M, Gupta A, Matsushita Y, Yamaguchi T, Mizuhashi K, Maki K, Ruellas AC, Cevidanes LS, Kronenberg HM, Ono N, Ono W. [Autocrine regulation of mesenchymal progenitor cell fates orchestrates tooth eruption](#). *PNAS USA*. 2019 116(2), 575-580.

Jones KB, Furukawa S, Marangoni P, Ma H, Pinkard H, D'Urso R, Zilionis R, Klein AM, Klein OD. [Quantitative clonal analysis and single-cell transcriptomics reveal division kinetics, hierarchy, and fate of oral epithelial progenitor cells](#). *Cell Stem Cell*. 2019 24, 183-192.

Athwal HK, Murphy G 3rd, Tibbs E, Cornett A, Hill E, Yeoh K, Berenstein E, Hoffman MP, Lombaert IMA. [Sox10 Regulates Plasticity of Epithelial Progenitors toward Secretory Units of Exocrine Glands](#). *Stem Cell Reports*. 2019 Feb 12;12(2):366-380.

Li G, Robles S, Lu Z, Li Y, Krayner JW, Leite RS, Huang Y. [Upregulation of Free Fatty Acid Receptors in Periodontal Tissues of Patients with Metabolic Syndrome and Periodontitis](#). *J Periodontal Res*. 2018. Dec 30.

de Beer M, van der Laan H, Cole MA, Whelan RJ, Burns MA, Scott TF. [Rapid, continuous additive manufacturing by volumetric polymerization inhibition patterning](#). *Sci Adv*. 2019; 5(1): eaau8723.

Ye, Z, Zhu X, Acosta S, Kumar D, Sang T, Aparicio C. [Self-assembly dynamics and antimicrobial activity of all L- and D-amino acid enantiomers of a designer peptide](#) *Nanoscale*. 2018; 11(1): 266-275.

Translational Genomics Research

Shaffer JR, LeClair J, Carlson JC, Feingold E, Buxó CJ, Christensen K, Deleyiannis KWB, Field LL, Hecht JT, Moreno L, Orioli IM, Padilla C, Vieira AR, Wehby GL, Murray JC, Weinberg SM, Marazita ML, Leslie EJ. [Association of low-frequency genetic variants in regulatory regions with nonsyndromic orofacial clefts](#). *Am J Med Genet A*. 2019 Mar;179(3):467-474.

Bhattacharya D, Rothstein M, Azambuja AP, Simoes-Costa M. [Control of neural crest multipotency by Wnt signaling and the Lin28/let-7 axis](#). *Elife*. 2018 Dec 6;7 pii: e40556.

Fu JM, Leslie EJ, Scott AF, Murray JC, Marazita ML, Beaty TH, Scharpf RB, Ruczinski I. [Detection of de novo copy number deletions from targeted sequencing of trios](#). *Bioinformatics*. 2019 Feb 15;35(4):571-578.

Publications from New Investigator R01-funded Projects

Athwal HK, Murphy G 3rd, Tibbs E, Cornett A, Hill E, Yeoh K, Berenstein E, Hoffman MP, Lombaert IMA. [Sox10 Regulates Plasticity of Epithelial Progenitors toward Secretory Units of Exocrine Glands](#). *Stem Cell Reports*. 2019 Feb 12;12(2):366-380.

Grayson M, Furr A, Ruparel S. [Depiction of Oral Tumor Induced Trigeminal Afferent Responses Using Single-Fiber Electrophysiology](#). *Sci Rep*. 2019 Mar 14;9(1):4574.

Division of Extramural Research Staff Publications

Proctor L, LoTempio J, Marquitz A, Daschner P, Xi D, Flores R, Brown L, Ranallo R, Maruvada P, Regan K, **Dwayne Lunsford R**, Reddy M, [Caler L. A review of 10 years of human microbiome research activities at the US National Institutes of Health, Fiscal Years 2007-2016.](#) *Microbiome*. 2019 Feb 26;7(1):31.

Smith PD, Thullen M, Evans C, Koerber A, **Weatherspoon D**. [Benefits and Challenges of Partner Site Engagement with Community-Based Dental Education Programs: The Partner Sites' Perspectives.](#) *J Dent Educ*. 2019 Apr 8. doi: 10.21815/JDE.019.102. [Epub ahead of print]

Selected Division of Intramural Research Publications

Athwal HK, Murphy G 3rd, Tibbs E, Cornett A, Hill E, Yeoh K, Berenstein E, Hoffman MP, Lombaert IMA. [Sox10 Regulates Plasticity of Epithelial Progenitors toward Secretory Units of Exocrine Glands.](#) *Stem Cell Reports*. 2019 Feb 12;12(2):366-380.

Brillante, B, & Guthrie, L. "McCune Albright Syndrome." In S. Llahana, C. Follin, C. Yedinak, A. Grossman (Eds.) *Advanced Practice in Endocrinology Nursing*. Switzerland: Springer. 2019:207-228.

de Castro LF, Burke AB, Wang HD, Tsai J, Florenzano P, Pan KS, Bhattacharyya N, Boyce AM, Gafni RI, Molinolo AA, Robey PG, Collins MT. [Activation of RANK/RANKL/OPG Pathway Is Involved in the Pathophysiology of Fibrous Dysplasia and Associated With Disease Burden.](#) *J Bone Miner Res*. 2019 Feb;34(2):290-294.

DuChez BJ, Doyle AD, Dimitriadis EK, Yamada KM. [Durotaxis by Human Cancer Cells.](#) *Biophys J*. 2019 Feb 19;116(4):670-683

Florenzano P, Pan KS, Brown SM, Paul SM, Kushner H, Guthrie LC, de Castro LF, Collins MT, Boyce AM. [Age-Related Changes and Effects of Bisphosphonates on Bone Turnover and Disease Progression in Fibrous Dysplasia of Bone.](#) *J Bone Miner Res*. 2019 Apr;34(4):653-660.

Kourtzelis I, Mitroulis I, Grosser D, Li X, Wang B, Kajikawa T, Czogalla A, Tausche AK, Renesse J, Troullinaki M, Doreth C, Chen LS, Hosur K, Lim J-H, Joosten LA, [Moutsopoulos NM](#), Wielockx B, Castrillo A, Korostoff JM, Coskun U, Hajishengallis G, Chavakis T. [The secreted protein Del-1 promotes resolution of inflammation.](#) 2019. *Nat Immunol*. 20(1):40-49.

Kuznetsov SA, Hailu-Lazmi A, Cherman N, de Castro LF, Robey PG, Gorodetsky R. [In Vivo Formation of Stable Hyaline Cartilage by Naïve Human Bone Marrow Stromal Cells with Modified Fibrin Microbeads.](#) *Stem Cells Transl Med*. 2019 Feb 14.

Limaye A, Hall B, Zhang L, Cho A, Prochazkova M, Zheng C, Walker M, Adewusi F, Burbelo PD, Sun ZJ, Ambudkar I, Dolan J, Schmidt B, Kulkarni AB. [Targeted TNF-alpha overexpression drives salivary gland inflammation.](#) *J Dent Res*. 2019 Apr 8:22034519837240.

[Myneni VD](#), [Mcclain-Caldwell J](#), [Martin D](#), [Vitale-Cross L](#), [Marko K](#), [Firriolo JM](#), [Labow BI](#), [Mezey E](#). [Mesenchymal stromal cells from infants with simple polydactyly modulate immune responses more efficiently than adult mesenchymal stromal cells.](#) *Cytotherapy*. 2019 Feb;21(2):148-161.

[Shitara A](#), [Malec L](#), [Ebrahim S](#), [Chen D](#), [Bleck C](#), [Hoffman MP](#), [Weigert R](#). [Cdc42 negatively regulates endocytosis during apical membrane maintenance in live animals.](#) *Mol Biol Cell*. 2019 Feb 1;30(3):324-332.

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Squire J, Gardner PJ, Moutsopoulos NM, Leiding JW. [Antibiotic Prophylaxis for Dental Treatment in Patients with Immunodeficiency](#). *J Allergy Clin Immunol Pract*. 2019 Mar;7(3):819-823.

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Ward MM, Castrejon I, Bergman MJ, Alba MI, Guthrie LC, Pincus T. [Minimal Clinically Important Improvement of Routine Assessment of Patient Index Data 3 in Rheumatoid Arthritis](#). *J Rheumatol*. 2019 Jan;46(1):27-30.

Zhang L, Ten Hagen KG. 2019. [O-linked glycosylation in *Drosophila melanogaster*](#). *Curr. Opin. Struct. Biol*. 56: 139-145.

FUNDING UPDATE

Program Announcements

- [Short-term Mentored Career Enhancement Award in Dental, Oral and Craniofacial Research for Mid-Career and Senior Investigators \(K18 Independent Clinical Trial Not Allowed\)](#)
Release Date: April 4, 2019
- [Clinical Research to Improve the Oral Health of Older Adults \(R01 Clinical Trial Not Allowed\)](#)
Release Date: April 4, 2019
- [Clinical Research to Improve the Oral Health of Older Adults \(R21 Clinical Trial Not Allowed\)](#)
Release Date: April 4, 2019
- [Administrative Supplement for Research on Bioethical Issues](#)
Release Date: March 12, 2019
- [Research on the Health of Women of Understudied, Underrepresented and Underreported \(U3\) Populations An ORWH FY19 Administrative Supplement \(Admin Supp Clinical Trial Optional\)](#)
Release Date: March 1, 2019
- [Ruth L. Kirschstein National Research Service Award \(NRSA\) Individual Senior Fellowship \(Parent F33\)](#)
Release Date: February 21, 2019
- [Ruth L. Kirschstein National Research Service Award \(NRSA\) Individual Postdoctoral Fellowship \(Parent F32\)](#)
Release Date: February 22, 2019
- [Ruth L. Kirschstein National Research Service Award \(NRSA\) Individual Fellowship for Students at Institutions with NIH-Funded Institutional Predoctoral Dual-Degree Training Programs \(Parent F30\)](#)
Release Date: February 22, 2019
- [Ruth L. Kirschstein National Research Service Award \(NRSA\) Individual Fellowship for Students at Institutions Without NIH-Funded Institutional Predoctoral Dual-Degree Training Programs \(Parent F30\)](#)
Release Date: February 22, 2019
- [Ruth L. Kirschstein National Research Service Award \(NRSA\) Individual Predoctoral Fellowship \(Parent F31\)](#)
Release Date: February 22, 2019

- [Ruth L. Kirschstein National Research Service Award \(NRSA\) Individual Predoctoral Fellowship to Promote Diversity in Health-Related Research \(Parent F31\)](#)
Release Date: February 22, 2019
- [Mechanisms Underlying the Contribution of Sleep Disturbances to Pain \(R01 Clinical Trial Optional\)](#)
Release Date: February 28, 2019
- [Mechanisms Underlying the Contribution of Sleep Disturbances to Pain \(R21 Clinical Trial Optional\)](#)
Release Date: February 28, 2019
- [Achieving Tissue Robustness Through Harnessing Immune System Plasticity \(R01 Clinical Trial Not Allowed\)](#)
Release Date: January 29, 2019
- [Achieving Tissue Robustness Through Harnessing Immune System Plasticity \(R21 Clinical Trial Not Allowed\)](#)
Release Date: January 29, 2019
- [NIDCR Dual Degree Dentist Scientist Pathway to Independence Award NIDCR Small Research Grants for Oral Health Data Analysis and Statistical Methodology Development \(R03 Clinical Trial Not Allowed\)](#)
Release Date: January 8, 2019
- [NIDCR Dentist Scientist Career Transition Award for Intramural Investigators \(K22 Independent Basic Experimental Studies with Humans Required\)](#)
Release Date: January 8, 2019
- [NIDCR Dentist Scientist Career Transition Award for Intramural Investigators \(K22 Independent Clinical Trial Not Allowed\)](#)
Release Date: January 8, 2019
- [Bioengineering Research Grants \(BRG\) \(R01 Clinical Trial Not Allowed\)](#)
Release Date: January 8, 2019
- [NIDCR Mentored Career Development Award to Promote Diversity in the Dental, Oral and Craniofacial Workforce \(K01 Independent Clinical Trial Not Allowed\)](#)
Release Date: January 8, 2019
- [NIDCR Mentored Career Development Award to Promote Diversity in the Dental, Oral and Craniofacial Workforce \(K01 Independent Basic Experimental Studies with Humans Required\)](#)
Release Date: January 8, 2019
- [NIDCR Dual Degree Dentist Scientist Pathway to Independence Award NIDCR Small Research Grants for Oral Health Data Analysis and Statistical Methodology Development \(R03 Clinical Trial Not Allowed\)](#)
Release Date: January 8, 2019
- [NIDCR Dentist Scientist Career Transition Award for Intramural Investigators \(K22 Independent Basic Experimental Studies with Humans Required\)](#)
Release Date: January 8, 2019
- [NIDCR Dentist Scientist Career Transition Award for Intramural Investigators \(K22 Independent Clinical Trial Not Allowed\)](#)
Release Date: January 8, 2019
- [Bioengineering Research Grants \(BRG\) \(R01 Clinical Trial Not Allowed\)](#)
Release Date: January 8, 2019
- [NIDCR Mentored Career Development Award to Promote Diversity in the Dental, Oral and Craniofacial Workforce \(K01 Independent Clinical Trial Not Allowed\)](#)
Release Date: January 8, 2019

- [NIDCR Mentored Career Development Award to Promote Diversity in the Dental, Oral and Craniofacial Workforce \(K01 Independent Basic Experimental Studies with Humans Required\)](#)
Release Date: January 8, 2019

Request for Applications

- [HEAL Initiative: Early Phase Pain Investigation Clinical Network - Specialized Clinical Centers \(U24 Clinical Trial Not Allowed\)](#)
Release Date: April 18, 2019
- [Building Interdisciplinary Research Careers in Women's Health \(BIRCWH\); K12 Clinical Trial Optional](#)
Release Date: April 8, 2019
- [Oral Health in People Living with HIV and Additional Non-Communicable Diseases \(R01 Clinical Trial Not Allowed\)](#)
Release Date: April 9, 2019
- [Limited Competition: Dental, Oral and Craniofacial Tissue Regeneration Consortium \(U24 Clinical Trial Not Allowed\)](#)
Release Date: March 12, 2019
- [Investigation of Co-occurring conditions across the Lifespan to Understand Down syndrome \(INCLUDE\) Clinical Trial Readiness \(R21 Clinical Trial Not Allowed\)](#)
Release Date: February 5, 2019
- [Transformative Research Award for the INCLUDE \(Investigation of Co-occurring Conditions across the Lifespan to Understand Down syndrome\) Project \(R01 Clinical Trial Not Allowed\)](#)
Release Date: February 5, 2019
- [Clinical Trials Development for Co-Occurring Conditions in Individuals with Down syndrome: Phased Awards for INCLUDE \(R61/R33 Clinical Trials Required\)](#)
Release Date: February 5, 2019
- [HIV/AIDS Clinical Trials Networks Laboratory Centers \(UM1 Clinical Trial Required\)](#)
Release Date: January 24, 2019
- [HIV/AIDS Clinical Trials Networks Statistical and Data Management Centers \(UM1 Clinical Trial Required\)](#)
Release Date: January 24, 2019
- [HIV Vaccines Clinical Trials Network Leadership and Operations Center \(UM1 Clinical Trial Required\)](#)
Release Date: January 24, 2019
- [Limited Competition for a Connectome Coordination Facility \(R24 Clinical Trial Not Allowed\)](#)
Release Date: January 25, 2019
- [Advancing Cancer Immunotherapy by Mitigating Immune-related Adverse Events \(irAEs\) \(U01 Clinical Trial Not Allowed\)](#)
- [Enabling Technologies to Accelerate Development of Oral Biodevices \(R21 Clinical Trial Not Allowed\)](#)
Release Date: January 22, 2019
- [Administrative Supplement for Research on Sex/Gender Influences \(Admin Supp Clinical Trial Optional\)](#)
Release Date: January 17, 2019
- [Women's HIV Epidemiology Cohort Studies \(R01 Clinical Trial Not Allowed\)](#)
Release Date: January 16, 2019

- [The Human Biomolecular Atlas Program \(HuBMAP\): Rapid Implementation of Technologies that Will Accelerate Development of a Framework for Mapping the Human Body at High Resolution \(UH3 Clinical Trial Not Allowed\)](#)
Release Date: January 9, 2019
- [Enabling Technologies to Accelerate Development of Oral Biodevices \(R21 Clinical Trial Not Allowed\)](#)
Release Date: November 15, 2018

Notices

- [Notice of Special Interest for Administrative Supplements for Research on Sexual and Gender Minority \(SGM\) Populations \(Admin Supp Clinical Trial Optional\)](#)
Release Date: April 17, 2019
- [Notice of NIDCR Participation in Building Interdisciplinary Research Careers in Women's Health \(K12 Clinical Trial Optional\)](#)
Release Date: April 10, 2019
- [Notice of Change to Key Dates for RFA-NS-19-016 "HEAL Initiative: Translational Devices to Treat Pain \(UG3/UH3 Clinical Trial Optional\)"](#)
Release Date: April 10, 2019
- [Notice of Change to Key Dates for RFA-NS-19-018 "HEAL Initiative: Clinical Devices to Treat Pain \(UH3 Clinical Trial Optional\)"](#)
Release Date: April 10, 2019
- [Notice of Change to Key Dates for RFA-EB-18-003 "HEAL Initiative: Translational Development of Devices to Treat Pain \(U18 Clinical Trial Not Allowed\)"](#)
Release Date: April 10, 2019
- [Notice of Changes to RFA-AI-19-002 "HIV/AIDS Clinical Trials Networks Statistical and Data Management Centers \(UM1 Clinical Trial Required\)"](#)
Release Date: March 11, 2019
- [Notice of Special Interest in Research on the Health of Sexual and Gender Minority \(SGM\) Populations](#)
Release Date: March 13, 2019
- [Notice of Clarification: Funds Available for RFA-DE-19-008 Enabling Technologies to Accelerate Development of Oral Biodevices \(R21 Clinical Trial Not Allowed\)](#)
Release Date: January 22, 2019
- [Notice of Clarification: Funds Available for RFA-DE-19-009 Enabling Technologies to Accelerate Development of Oral Biodevices \(R01 Clinical Trial Not Allowed\)](#)
Release Date: January 22, 2019
- [Notice of NIDCR Participation in RFA-DA-19-035 "HEAL Initiative: Preventing Opioid Use Disorder in Older Adolescents and Young Adults \(ages 16-30\) \(UG3/UH3 Clinical Trial Required\)"](#)
Release Date: January 7, 2019
- [Notice of Pre-Application Webinar for RFA-DE-19-007 "NIDCR Mentoring Network to Support a Diverse Dental, Oral and Craniofacial Research Workforce \(UE5 Clinical Trial Not Allowed\)"](#)
Release Date: January 7, 2019
- [Notice of NIDCR Participation in RFA-DA-19-035 "HEAL Initiative: Preventing Opioid Use Disorder in Older Adolescents and Young Adults \(ages 16-30\) \(UG3/UH3 Clinical Trial Required\)"](#)
Release Date: January 7, 2019
- [Notice of Pre-Application Webinar for RFA-DE-19-007 "NIDCR Mentoring Network to Support a Diverse Dental, Oral and Craniofacial Research Workforce \(UE5 Clinical Trial Not Allowed\)"](#)
Release Date: January 7, 2019