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

September 2016

ACTIVITIES OF THE NIDCR DIRECTOR

Since the last meeting of the National Advisory Dental and Craniofacial Research Council in May 2016, NIDCR Director Martha J. Somerman, DDS, PhD, maintained an active schedule of delivering presentations to stakeholders, meeting with working groups and other organizations, and attending research symposia.

During the last four months, Dr. Somerman engaged in a number of notable activities:

- At the College of Dentistry at the University of Illinois at Chicago on May 3, she delivered the Distinguished Speaker Series presentation titled "Enhancing Oral Health through Research and Innovation."

- On May 23, Dr. Somerman and her colleagues met with Congressman Paul A. Gosar, DDS (R-AZ) and his senior legislative assistant, Mr. Trevor Pearson, on the NIH campus in Bethesda, MD. She described research supported by NIDCR and provided a report highlighting NIDCR-supported research and innovation. Dr. Gosar visited NIDCR's research laboratories and dental clinic.

- On June 16 at the Food and Drug Administration (FDA) headquarters in Silver Spring, MD, Dr. Somerman presented "NIDCR TMJ and Pain Research*"* at the MDEpinet TMJ Patient RoundTable. This event was organized by FDA and the TMJ Association to convene clinicians, temporomandibular disease patients and patient advocates, industry representatives, and NIH, FDA, and AHRQ representatives to discuss TMJ implant performance, surgical outcomes, and adverse events. NIDCR Acting Deputy Director John Kusiak, PhD, summed up the discussions by proposing research directions, such as advancing phenotyping and diagnostics of the disorders, behavioral research, microbiota studies, overlapping chronic pain conditions, inflammation, infection, neuro-immune interactions, sex differences, big data and data science, tissue engineering, and toxicity and implant failure. Lillian Shum, PhD, director of NIDCR's Division of Extramural Research, and Yolanda Vallejo-Estrada, PhD, director of NIDCR's Molecular and Cellular Neuroscience Program, also participated in the RoundTable.

- On June 28, Dr. Somerman provided NIH's perspective on the priorities, common challenges, and requirements in the field of regenerative medicine at the first meeting of the Forum for Regenerative Medicine at the National Academies of Sciences, Engineering, and Medicine in Washington, DC. The forum brings together representatives from government, academia, industry, patient/provider organizations, and others to discuss issues in a neutral setting. Nadya Lumelsky, PhD, director of NIDCR's Tissue Engineering and Regenerative Medicine Research Program, planned, co-organized, and attended the forum's inaugural meeting. Also participating in the forum were Dr. Lillian Shum; Preethi Chander, PhD, a health specialist with NIDCR's Integrative Biology and Infectious Diseases Branch; and Morgan O'Hayre, PhD, special assistant to the NIDCR director and acting deputy director; as well as directors and program staff from the National Heart, Lung, and Blood Institute; National Institute of Arthritis and Musculoskeletal and Skin Diseases; National Institute of Biomedical Imaging and Bioengineering; National Institute of Diabetes and Digestive and Kidney Diseases; and National Institute of Neurological Disorders and Stroke.

- On July 8, Dr. Somerman was a panelist for the "Future Careers in Oral Health Research and Dentistry" event at NIDCR in Bethesda, MD. The panel was led by Deborah Philp, PhD, director of

NIDCR's Division of Intramural Research (DIR) Office of Education. Other panel members included Margo Adesanya, DDS, MPH, chief of NIDCR's Science Policy and Planning Branch; Jane Atkinson, DDS, director of NIDCR's Clinical Trials Program; Gallya Gannot, DMD, PhD, program officer for NIDCR's Clinical Research and Clinical Technologies; and Jacqueline Mays, DDS, PhD, an assistant clinical investigator in DIR. NIDCR summer interns, summer dental students, and postbaccalaureate research trainees attended, as well as participants in summer programs from the University of Maryland School of Dentistry and Howard University College of Dentistry, and other trainees from the NIH intramural community.

- Dr. Somerman presented "NIDCR: Enhancing Oral Health through Research and Innovation*"* to the advocacy group Friends of NIDCR, which is part of the American Association of Dental Research, via a conference call on July 11.

- She updated the American Dental Association Council on Scientific Affairs with a report, "NIDCR Update on Caries, Periodontal Disease and Oral Cancer" via a conference call on July 14.

- In the August issue of the *Journal of the American Dental Association*, Dr. Somerman and Acting Deputy Director John Kusiak, PhD, published a guest editorial called "Data science at the National Institute of Dental and Craniofacial Research: Changing dental practice."

- She delivered an introductory talk titled "NIDCR: Enhancing Oral Health through Research and Innovation*"* at the American Dental Association Foundation Caries Symposium at the New York University College of Dentistry in New York City, NY, which was held on August 17 and 18.

Dr. Somerman was recently interviewed by several writers at the National Institutes of Health, and this summer three articles and a video were published:

- On June 22, an article about Dr. Somerman was published on the NIH Women in Biomedical Careers website for the Women Scientists in Action section. Dr. Somerman's profile was published as one of the Women Scientist Profiles.

- On July 29, the National Institute of Aging published "Jogging Relieves My Stress," a video interview of Dr. Somerman that is meant to inspire people to exercise. The video is also part of the playlist on "NIH Directors Share Their Exercise Stories."

- An interview with Dr. Somerman called "NIH Research Addresses Aging Issues and Disparities in Oral Health" appeared in the summer issue of NIH Medline Plus magazine,

- On August 12, an article about Dr. Somerman's passion for running and exercising outdoors was published in the *NIH Record*. The article was called "NIDCR Director Hits Ground Running**."**

On behalf of Dr. Somerman, Dr. Kusiak provided the opening remarks and introduction for the 2016 NIH Pain Consortium Symposium. The two-day event —"Innovative Models and Methods"—highlighted pain research advances, including lessons learned in translational research, and was held on May 31 and June 1 at the Natcher Auditorium on the NIH campus in Bethesda. Dr. Kusiak delivered a presentation titled "Advances in Pain Research."

"State of NIDCR" Town Hall

Dr. Somerman wants to ensure that the Institute's research endeavors promote evidence-based, precise, cost-effective health care and disease prevention strategies, help to overcome health disparities, and integrate oral and overall health. At a town hall event for all NIDCR staff on June 21, Dr. Somerman described "NIDCR 2030," a soon-to-be-launched strategic visioning process for engaging stakeholders and the public in helping to guide the Institute's scientific priorities and future directions. She explained that she and her executive staff have drafted a set of ambitious goals to be achieved by 2030 and that

she will seek input from internal and external stakeholders on the goals and how to achieve them. During the event, Alicia Dombroski, PhD, director of NIDCR's Division of Extramural Activities, described her division's organization, staff members, and functions. She presented an overview of some of the most significant changes at NIH over the past 10 to 15 years and provided predictions about how her division will evolve its functions through 2030. Similarly, John Prue, MS, NIDCR's chief information officer and director of the Office of Information Technology, provided predictions for how information technology will evolve through 2030, and how those advances will influence scientific inquiry and everyday life.

BUDGET UPDATE

FY 2016

The FY 2016 enacted budget for NIDCR is $415,582,000. This amount has been reduced by a transfer out for HIV/AIDS in the amount of $2,186,000 and the Secretary's transfer for Zika virus in the amount of $575,185, yielding an operating level of $412,820,815.

FY 2017

The President's Budget Request would provide $413,396,000 for FY 2017 for NIDCR; however, it is expected that NIDCR and the rest of NIH will begin FY 2017 under a continuing resolution at levels most likely approximating what was received for FY 2016. The complete NIDCR Budget Justification is available for viewing at http://www.nidcr.nih.gov/AboutUs/BudgetCongressionalStatements/CongressionalJustifications/Documents/NIDCRBudgetCJFY17.pdf.

HHS/NIH UPDATE

HHS Expands Oral Health Services at Health Centers

In June, Health and Human Services Secretary Sylvia M. Burwell announced nearly $156 million in funding to support 420 health centers in 47 states, the District of Columbia, and Puerto Rico to increase access to integrated oral health care services and improve oral health outcomes for Health Center Program patients. This funding enables health centers to expand integrated oral health care services and increase the number of patients served. With these awards from the Health Resources and Services Administration, health centers across the country will increase their oral health service capacity by hiring approximately 1,600 new dentists, dental hygienists, assistants, aides, and technicians to treat nearly 785,000 new patients.

NIH Builds Infrastructure for Precision Medicine Initiative

In July, NIH announced $55 million in awards in fiscal year 2016 to build the foundational partnerships and infrastructure needed to launch the Cohort Program of President Obama's Precision Medicine Initiative (PMI). The PMI Cohort Program is a landmark longitudinal research effort that aims to engage one million or more U.S. participants to improve our ability to prevent and treat disease based on individual differences in lifestyle, environment, and genetics. The awards will support a Data and Research Support Center, Participant Technologies Center, and a network of Healthcare Provider Organizations. With these awards, NIH is on course to begin initial enrollment into the PMI Cohort Program in 2016, with the aim of meeting its enrollment goal by 2020.

White House Launches National Microbiome Initiative

In May, the White House Office of Science and Technology Policy announced a new National Microbiome Initiative (NMI) to foster the integrated study of microbiomes across different ecosystems. With the collaboration of scientists from NIH and other agencies, academia, and the private sector, the objective of

the NMI is to advance understanding of microbiome behavior and enable protection and restoration of healthy microbiome function. The NMI will support interdisciplinary research and the development of platform technologies to share knowledge about microbiomes.

White House Holds Cancer Moonshot Summit

In June at the Cancer Moonshot Summit held at Howard University in Washington, DC, Vice President Biden announced new actions to double the rate of progress toward a cure for cancer. About 6,000 people took part in the summit from every state in the country. This is the first time a group this expansive and diverse convened under a government charge to double the rate of progress in the understanding, prevention, diagnosis, treatment, and care of cancer.

NIH Studies Zika Virus Risks and Possible Vaccine and Treatments

Experts estimate that active local transmission of the Zika virus is occurring in 60 countries and territories. The virus has been linked to a spike in cases of microcephaly, a condition in which babies are born with abnormally small heads and possible neurological damage. Over the past few months, NIH has issued several news announcements regarding studies of health risks, a vaccine, and compounds that show promise as treatments.

- **Health Risks in Infants and Pregnancy:** In June, NIH and Fundacao Oswaldo Cruz-Fiocruz, a national scientific research organization linked to the Brazilian Ministry of Health, began a multi-country study to evaluate the magnitude of health risks that Zika virus infection poses to pregnant women and their developing fetuses and infants. The study opened in Puerto Rico and will expand to several locations in Brazil, Colombia, and other areas that are experiencing active local transmission of the virus. The National Institute of Allergy and Infectious Diseases (NIAID), the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD), and the National Institute of Environmental Health Sciences (NIEHS) are funding and conducting the study, along with Fundacao Oswaldo Cruz-Fiocruz.

- **Zika Vaccine:** In August, NIAID launched a clinical trial of a vaccine candidate intended to prevent Zika virus infection. The early-stage study will evaluate the experimental vaccine's safety and ability to generate an immune system response in participants. At least 80 healthy volunteers are expected to participate in the trial. Scientists at NIAID's Vaccine Research Center developed the investigational vaccine earlier this year.

- **Zika Treatment Compounds**: In August, researchers at NIH's National Center for Advancing Translational Sciences reported that they identified compounds that potentially can be used to inhibit Zika virus replication and reduce its ability to kill brain cells. Study results were published in the August 29 issue of *Nature Medicine.* NIAID, NIH's National Institute of Neurological Disorders and Stroke, and other organizations also supported the research.

NIH Names Diana Bianchi, MD, Director of the National Institute of Child Health and Development

In August, NIH Director Francis S. Collins, MD, PhD, announced the selection of Diana W. Bianchi, MD, as director of the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD). She will join NIH from the Floating Hospital for Children and Tufts Medical Center in Boston where she serves as the founding executive director of the Mother Infant Research Institute and vice chair for pediatric research. She is also the Natalie V. Zucker Professor of Pediatrics, Obstetrics, and Gynecology at Tufts University School of Medicine and the editor-in-chief of the international journal *Prenatal Diagnosis*. Dr. Bianchi is expected to join NIH on October 31.

Joshua Gordon, MD, PhD, Selected as Director of the National Institute of Mental Health

In July, Dr. Collins announced the selection of Joshua A. Gordon, MD, PhD, as the director of the National Institute of Mental Health. Most recently, Dr. Gordon has been an associate professor of psychiatry at Columbia University Medical Center and a research psychiatrist at the New York State Psychiatric Institute. In addition, he is an associate director of the Columbia University/New York State Psychiatric Institute Adult Psychiatry Residency Program, where he directed the neuroscience curriculum and administered the research programs for residents.

Patricia Flatley Brennan, RN, PhD, Becomes Director of the National Library of Medicine

In August, Patricia Flatley Brennan, RN, PhD, began her service as director of the National Library of Medicine (NLM). She is the first woman and the first nurse to serve in that role. Previously, at the University of Wisconsin-Madison, she was the Lillian L. Moehlman Bascom Professor at the School of Nursing and College of Engineering. Dr. Brennan has been a pioneer in the development of information systems for patients.

Maureen Goodenow, PhD, Becomes NIH Associate Director for AIDS Research and Director of the NIH Office of AIDS Research

Maureen M. Goodenow, PhD, is now the NIH associate director for AIDS Research and director of the NIH Office of AIDS Research. Previously, Dr. Goodenow was at the University of Florida, Gainesville, where she was a professor of pathology, immunology, and laboratory medicine. She brings nearly 30 years of experience in HIV/AIDS research and advocacy to the position. She received her PhD in molecular genetics from the Albert Einstein College of Medicine in New York. Following a postdoctoral fellowship in molecular oncology at the Sloan Kettering Institute in New York, she was a visiting scientist at the Pasteur Institute in Paris, where she began her studies of HIV.

NIH Analyzes Impact of Clinical Research Training Program

The 1997-2012 Clinical Research Training Program, which evolved into the NIH Medical Research Scholars Program in 2012, was an NIH intramural initiative for medical and dental students to enhance their interest in clinical research careers. During its 16-year run, the program provided year-long mentored clinical or translational research opportunities for 340 medical and dental students, chosen from 1,300 applicants. At a time when the number of clinician-scientists is declining, the study indicates that the program helped shape the careers of many research-oriented medical and dental students. Of the 130 survey respondents, 84 indicated that they were conducting research and 74 of these researchers were in faculty positions at academic medical centers.

NIDCR UPDATE

Institute News

NIH Chooses Scientific Images from NIDCR Grantees for Flickr Image Gallery
In June, NIH unveiled their new Flickr gallery of 42 scientific images from NIH grantees and intramural investigators. The centralized Flickr image service enables the public to use the images as long as they credit the source. Easy access to the winning NIDCR grantee scientific images is provided via the NIDCR homepage (www.nidcr.nih.gov).

NIDCR and NLM Co-sponsor New Dental Public Health Fellowship
NIDCR and NLM are co-sponsoring a two-year, full-time combined Dental Public Health Residency/Dental Informatics Fellowship. The NIDCR-NLM Fellowship provides dental public health specialty training and public health informatics training to dental professionals with an interest in applying informatics science as it relates to dental research, education, and clinical care. Potential areas of research in the training curriculum include health services research, surveillance, disease prevention, and

health promotion with an emphasis on incorporating "big data" or data analytics concepts and skills, such as text mining, named entity recognition, image analysis, health records analysis, and clinical research informatics. The program, which is the first of its kind in the nation, builds on the existing one-year Dental Public Health Residency Fellowship, which will continue to be offered as well.

NIDCR Participates in Zika Virus Readiness Roundtable
In May, NIDCR's Division of Extramural Research Director Lillian Shum, PhD, participated in a Zika virus readiness roundtable discussion in Baltimore, MD, hosted by Senator Ben Cardin (D-MD) for representatives from state and federal organizations, scientific investigators, local hospital leaders, and industry partners. Participants discussed current research activities and also potential new research opportunities, should additional funding become available.

NIDCR Proposes FY 2018 Research Initiatives
Over the summer, NIDCR requested public input about research areas for new initiatives for FY 2018. Each year, NIDCR identifies broad research topic areas and develops a specific initiative proposal for each area. Many proposed initiatives from previous years have become funding opportunities. The deadline for input was September 9. The five research initiatives proposed for FY 2018 are…

- Immunotherapy Strategies to Target Head and Neck Cancers
- Implementation Science and Oral Health
- Mechanisms of Oral HIV Vaccine-induced Immunity
- Role of the Nervous System in Craniofacial Bones
- Role of the Oral Microbiome in Oral HIV Pathogenesis, Vaccines, and Host Immunity

Oral Health Disparities Consortium Holds External Scientific Committee Meeting
On June 7, Dena Fischer, DDS, MSD, MS; Laura Hsu, PhD; Mary Cutting, MS, RAC; and Jane Atkinson, DDS, PhD, of NIDCR's Center for Clinical Research in the Division of Extramural Research attended an initial face-to-face meeting with the External Scientific Committee (ESC) for the Oral Health Disparities Research Consortium. Study teams representing each of the UH2 health disparities research awards presented summaries of their study plans and were provided feedback from the ESC members. The meeting was held at the University of California, San Francisco, and was hosted by the UCSF-based Coordinating Center for the Oral Health Disparities Consortium.

NIDCR Offers Researchers Genomic Data Release
On May 19, genomic and phenotypic data for the OPPERA project, which is supported by NIDCR, were made available to qualified researchers through dbGaP: Genome Wide Association Study of Chronic TMD: Discovery Phase (dbGaP Study Accession: phs000796.v1.p1).

NIDCR Releases New Funding Opportunities
NIDCR released several new research funding opportunities, which are described below. For a comprehensive list of all funding opportunities released since the last meeting of the NADCRC, please refer to the section called "FUNDING UPDATE" on page 20 of this report.

- **Biosensors in the Oral Cavity (R01 and R21):** The purpose of this funding opportunity announcement is to support the development of new or modified biosensors for noninvasive, dynamic, real-time monitoring of physiological processes in the human body, using the oral cavity as the sensing site. These biosensors should be able to assess health and disease states by receiving and analyzing signals from oral fluids, oral and dental tissues, cells and microorganisms, and compounds found in or passing through the oral cavity.

- **Factors Underlying Differences in Female and Male Presentation for Dental, Oral, and Craniofacial Diseases and Conditions (R01 and R21):** The purpose of this funding opportunity announcement is to encourage research on mechanisms underlying the manifestations of sex-based differences in diseases that have an impact on the dental, oral, and craniofacial complex. This initiative encourages studies aimed at understanding immune reactivity, genetic variation, environmental triggers, aging, and hormonal changes as they affect sex-based differences in

diseases such as Sjögren's syndrome, orofacial pain, temporomandibular disorder, salivary gland tumors, and human papillomavirus-associated oropharyngeal cancers.

- **NIDCR Small Research Grants for Secondary Analysis of FaceBase Data (R03):** The FaceBase Consortium is developing a variety of comprehensive datasets on craniofacial development that are available to the wider scientific community at www.facebase.org. This funding opportunity announcement will support meritorious research projects that conduct secondary data analyses of FaceBase datasets relevant to craniofacial development, human craniofacial conditions or traits, and animal models of those craniofacial conditions. Informatics projects that integrate data from multiple FaceBase datasets are especially encouraged.

Division of Extramural Research Sponsors Four Poster Presentations at 2016 Association for Psychological Science Convention

NIDCR sponsored four new investigators to present posters at the 2016 Association for Psychological Science Convention in Chicago, IL, on May 26 to 29. This is the fourth annual installment of the NIDCR Building Bridges Travel Award initiative, which is meant to build bridges between two research communities who have not traditionally interacted: researchers in psychological science and researchers in oral health. Dave Clark, PhD, and Melissa Riddle, PhD, of NIDCR's Behavioral and Social Sciences Research Branch in the Division of Extramural Research, hosted the four awardees at the convention:

- Yi-Yuan Tang, PhD, Texas Tech University, presented a poster titled, "A Novel and Brief Intervention Improves Self-Control and Promotes Health Behavior."
- Michelle Ali, Mount Holyoke College, presented a poster titled, "Interpersonal Judgments of Individuals with Facial Disfigurement Before and After Treatment."
- Kevin Fleming, PhD, Norwich University, presented a poster titled, "An Eye-Tracking Analysis of Perceived Facial Differences in Children with Cleft Lip Deformities."
- Lauren Spencer, Penn State University, presented a poster titled, "Miserable Awareness over Blissful Ignorance: People Want to be Warned about Repeated Unpleasant Tasks Even if it Makes Them Feel Worse."

Personnel Update

Matthew Hoffman, BDS, PhD, Appointed as NIDCR Deputy Scientific Director

Matthew P. Hoffman, BDS, PhD, who is a senior investigator and chief of the Matrix and Morphogenesis Section in the Laboratory of Cell and Developmental Biology (LCDB) in NIDCR's Division of Intramural Research, has been appointed the Division's deputy scientific director. Hoffman became an NIDCR postdoctoral fellow in 1994, staff scientist in 2000, tenure-track investigator in 2004, senior investigator in 2011, and deputy branch chief in LCDB in 2015. Hoffman earned a BDS from the University of Otago in Dunedin, New Zealand, in 1986 and a PhD in microbiology and immunology from the University of Rochester in 1994.

James Melvin, DDS, PhD, Directs Dental Clinical Research Fellowship Program

James E. Melvin, DDS, PhD, who has been the acting deputy scientific director since April 2015, will now devote more energy to the NIDCR Dental Clinical Research Fellowship Program, which he revitalized several years ago during his tenure as clinical director from 2010 to 2015. Before joining NIDCR, Melvin was professor of pharmacology and physiology in the Center for Oral Biology, School of Medicine and Dentistry at the University of Rochester in New York.

Chair and Vice-Chair Selected for NIDCR Committee for Diversity and Inclusion

In June, NIDCR Director Martha Somerman appointed a chair and vice-chair to the Committee for Diversity and Inclusion. The chair is Emily Harris, PhD, MPH, chief of the Translational Genomics Research Branch in the Division of Extramural Research, and the vice-chair is Deborah Philp, PhD, director of the Office of Education. The purpose of the committee is to advise the NIDCR Director and other senior leaders on a wide range of diversity and inclusion issues and to recommend and implement strategies for enhancing diversity at NIDCR.

Eleven NIDCR Staff Members Receive 2016 NIH Director's Award
In July, NIH Director Francis Collins presented the NIH Director's Award to 11 NIDCR staff for their activities as leaders, mentors, or part of working groups and committees. Dr. Somerman was on the stage to help present awards to the NIDCR honorees:

- John Kusiak, PhD, acting deputy director for NIDCR, for exemplary leadership and innovative contributions toward advancing NIDCR's public-private partnerships and trans-NIH leadership activities;
- Thomas Bugge, PhD, senior investigator in the Division of Intramural Research, for outstanding performance while demonstrating significant leadership, skill, and ability in serving as a mentor;
- Yasaman Shirazi, PhD, and Marilyn Moore-Hoon, PhD, of the Division of Extramural Activities, as part of the OD Group Award for the RPC Reviewer Guidance Working Group in recognition of outstanding leadership and creativity in designing, launching, and maintaining the new "Guidance for Reviewers" website;
- Emily L. Harris, PhD, chief of the Translational Genomics Research Branch in NIDCR's Division of Extramural Research, as a member of the Environmental Influences on Child Health Outcomes Working Group for catalyzing the advancement of pediatric and environmental health research;
- Dwayne Lunsford, PhD, director of the Microbiology Program in NIDCR's Division of Extramural Research; David Vannier, PhD, of the Office of Communications and Health Education; Morgan O'Hayre, PhD, of the Office of the Director; and Jonathan Horsford, PhD, and Wendy Knosp, PhD, both of the Office of Science Policy and Analysis, for their significant contributions on the NIH-wide Strategic Plan working group.
- Paul Newgen as part of the OD Group Award for the Public Access Support Center Team for exceptional dedication, commitment, and creativity in developing and implementing the Public Access Support Center Pilot.

Three NIDCR Postdoctoral Fellows Receive FARE Awards
In July, the NIH Fellows Committee, the Scientific Directors, and the NIH Office of Intramural Training and Education announced that three NIDCR trainees were among 206 recipients of the 2017 NIH Fellows Awards for Research Excellence (FARE). The FARE awardees are Belinda Hauser, PhD, of the Laboratory of Cell and Development Biology (LCDB), Brian DuChez, PhD, also of LCDB, and Zulfeqhar Syed, PhD, of the Oral and Pharyngeal Cancer Branch. This competition provides recognition for the outstanding scientific research performed by intramural postdoctoral fellows. All submitted abstracts were peer reviewed in a blind study section competition. Winners of FARE awards will each receive a $1,000 stipend to attend a scientific meeting to present their research findings. In recognition of this honor, the NIDCR Office of the Scientific Director will provide NIDCR award recipients full support for travel, registration, and housing for one meeting.

NIH Medical Research Scholars Program Selects Two Dental Students
Two dental students were selected to take part in the 2016-2017 NIH Medical Research Scholars Program (MRSP). The MRSP trains the most promising future dentists, physicians, and veterinarians in research methods. Scholars accepted into the MRSP are provided with a year-long, highly competitive research training experience that is designed to inspire research careers. John Le, a student at the University of Michigan School of Dentistry, is working in the laboratory of NIDCR Clinical Director Janice Lee, DMD, MD, MS. Jason Berglund, a student from Tufts University School of Dental Medicine, is working in the laboratory of Michael Collins, MD, chief of the Skeletal Disorders and Mineral Homeostasis Section. Mr. Berglund was a 2015 NIDCR Summer Dental Student Award recipient.

Young Investigators Win Awards from American Society for Bone and Mineral Research
Mary Scott Ramnitz, MD, staff clinician with NIDCR's Skeletal Clinical Studies Unit in CSDB, received a Young Investigator Award, and Andrea Burke, DMD, MD, dental clinical research fellow, received a Young Investigator Travel Grant from the American Society for Bone and Mineral Research for their abstracts for the annual meeting on September 16 to 19 in Atlanta, GA.

Administrative Officer Andriece King, MBA, Joins Office of the Director
In August, Andriece King, MBA, joined the Office of Administrative Management in NIDCR's Office of the Director as an administrative officer. Previously, Ms. King was a program support specialist in NIDCR's Oral and Pharyngeal Cancer Branch. Before that, she was an executive assistant in NIDCR's Office of the Clinical Director. Before joining NIDCR in 2014, Ms. King worked with the Department of Energy and HGM Management and Technologies, Inc. She earned a bachelor's degree in mass communications from Virginia State University and a master's degree in business administration from the University of Phoenix.

Two Dentists Join the NIDCR Dental Clinical Research Fellowship Program
The NIDCR Dental Clinical Research Fellowship Program is a two-year or greater full-time program designed to train dentists in the latest clinical, translational, and basic research methodologies in preparation for an academic career. Qualified applicants hold a DDS/DMD or equivalent dental clinical degree and a demonstrated interest in dental, oral, and craniofacial research as evidenced by prior research experience. Dr. Blake Warner, a graduate of the DDS/PhD program at the Ohio State University, has a certificate in oral and maxillofacial pathology from the University of Pittsburgh Medical Center and School of Dental Medicine and is working in the laboratory of Jay Chiorini, PhD, deputy chief of NIDCR's Adeno-Associated Virus Biology Section. Dr. Fahad Kidwai, holds a BDS from Baqai Medical and Dental University, Pakistan, and completed a PhD at the National University of Singapore and a fellowship in oral biology and oral sciences from the School of Dentistry at the University of Minnesota. Dr. Kidwai will be working in the laboratories of Pamela Robey, PhD, chief of NIDCR's Craniofacial and Skeletal Diseases Branch and NIDCR Clinical Director Janice Lee, DDS, MD, MS, chief of the Craniofacial Anomalies and Regeneration Section.

NIDCR Welcomes Three New Dental Public Health Residents
This summer, three dental public health residents joined NIDCR:

- Alexander Richard Kailembo, DDS, MPH, graduated in 2011 from Muhimbili University of Health and Allied Sciences in Dar-es-Salaam, Tanzania. After three years as a clinician in the public and private sectors, he earned a master's in public health at Umea University, Sweden in 2014, made possible through the Swedish Institute Scholarship program. His research interests include inequalities in oral health.
- Monisha Billings, DDS, MPH, PhD, has worked on infectious disease research and public health programs at Johns Hopkins University, the World Health Organization, Geneva, and The Gates Foundation. She earned a PhD in Global Disease Epidemiology and Control from Johns Hopkins University. In 2015, she joined NIDCR as a dental clinical research fellow to study the clinical epidemiology of Sjögren's syndrome and to design studies with Clinical Investigator Ilias Alevizos, DMD, MMSc. She joined the NIDCR Dental Public Health Residency Program to hone her expertise in epidemiology, biostatistics, public health, and oral health informatics, and will pursue a career in dental, oral, and craniofacial research.
- Israel Agaku, DMD, MPH, is an alumnus of the CDC's Epidemic Intelligence Service (EIS) program, which is a fellowship in applied epidemiology. He is the deputy associate director for science in CDC's Office on Smoking and Health in Atlanta, GA. He is also an adjunct faculty at the Harvard School of Dental Medicine in the Department of Oral Epidemiology. He has published about 70 articles on tobacco control in leading journals including *JAMA*, *Pediatrics*, *Tobacco Control*, and the *American Journal of Public Health*. He serves as associate editor of the journals *Tobacco Induced Diseases* and *BMC Public Health*. In addition to his interests in tobacco control, he has participated in numerous infectious disease outbreaks including the 2012 multistate fungal meningitis outbreak, as well as multiple deployments to Liberia and Sierra Leone during the recent West African Ebola outbreak.

Cambridge University Communications Team Releases Interview Podcast of NIDCR Postdoc Jennifer Symonds, PhD
A Cambridge University communications team called The Naked Scientists recently interviewed NIDCR/LCDB postdoctoral fellow Jennifer Symonds, PhD, and they published a 10-minute interview podcast called "Building Glands." The Naked Scientists are a team of scientists, doctors, and communicators who make science radio programs for the BBC so that the public can understand science.

Isaac Rodriguez-Chavez, PhD, MS, MHS, Leaves NIDCR for Texas Biomedical Research Institute
In August, Isaac R. Rodriguez-Chavez, PhD, MS, MHS, director of NIDCR's AIDS and Immunosuppression Program, left NIDCR for the Texas Biomedical Research Institute in San Antonio. Over the past 17 years, he worked at four NIH institutes and had been with NIDCR for the last eight.

Meetings and Conferences

Staff Presentations

At multiple conferences, workshops, and meetings, Division of Extramural Research staff served as panel moderators and panelists and delivered poster and oral presentations:

- Melissa Riddle, PhD, chief of the Behavioral and Social Science Research Branch (BSSRB), assisted with planning and implementation of the NIH Science of Behavioral Change (SOBC) programming at the 2016 Association for Psychological Science Convention in Chicago, IL, May 26-29. SOBC events included the "SOBC Discussion Hour and Coffee Break" at which Dr. Melissa Riddle served as discussion facilitator, as well as a symposium, "Mechanism-Focused Intervention Research: Developing Implementable Interventions in People as They Age," which featured BSSRB-funded investigator Dr. Robert Levenson of the University of California at Berkeley.

- Yolanda Vallejo-Estrada, PhD, director of the Neuroscience of Orofacial Pain and Temporomandibular Disorders Program, moderated a panel session on Lessons Learned in Translational Research at the 11th Annual NIH Pain Consortium Symposium: Innovative Models and Methods held May 31 and June 1. The symposium featured NIH-supported investigators whose research projects have made an important contribution to pain research.

- On June 28, Dr. Vallejo-Estrada gave a presentation on pain research and funding opportunities at the North American Pain School (NAPS) in Montebello, QC, Canada. NAPS is a new effort to bring together leading experts in the fields of pain research and management to provide a unique educational and networking experience for the next generation of basic and clinical pain researchers. Approximately 30 trainees (predoctoral, postdoctoral, and early stage investigators) from the US and Canada were present together with leading US and Canadian pain researchers.

- Amanda Melillo, PhD, director of the Salivary Biology and Immunology Program, presented "NIH Program Updates" and participated in a question and answer session at the Microbial Glycobiology conference, which took place on June 15 to 19 in West Palm Beach, FL. The conference reviewed many cutting-edge technologies used in identifying or characterizing new microbial glycosylation pathways, novel bioactive glycans, a plethora of carbohydrate-active proteins, and the complexity of interactions between host and microbial systems.

- Dwayne Lunsford, PhD, director of the Microbiology Program, chaired the Oral Microbiota and Human Disease Session at the National Heart, Lung and Blood Institute's "The Role of Microbiota in Blood Pressure Regulation" working group held on June 10. A position paper based on the working group consensus will be drafted and published in an appropriate journal.

- Sundar Venkatachalam, PhD, director of the Oral and Salivary Gland Cancer Biology Program, presented a talk titled "Oral and Salivary Gland Cancer Research at NIDCR" at the American Head and Neck Society meeting held July 16-20 in Seattle, WA. The conference theme was Technology Transforming Head and Neck Cancer Care and brought together clinicians and researchers from various disciplines related to the treatment of head and neck cancer.

- Orlando Lopez, PhD, director of the Dental Materials and Biomaterials Program, attended the third annual grantee meeting for the novel dental composite restorative systems initiative. Six teams of U01

grantees as well as NIDCR staff and several external scientists attended the meeting held July 12 to 14 in Ann Arbor, MI. Each team presented an update of their research accomplishments. The group discussed real or potential bottlenecks in polymer development and solutions and milestones for the next year. Jason Wan, PhD, director of the Mineralized Tissue Physiology Program and Preethi Chander, PhD, health specialist, Division of Extramural Research, also represented NIDCR at this meeting.

Staff Attendance

Staff members from the Division of Extramural Research attended conferences, workshops, and meetings to offer their expertise to investigators and trainees involved in NIDCR-supported research:

- Annual Meeting of the American Association for Cancer Research in New Orleans, LA, on April 16 to 20.
- FaceBase 2 annual steering committee meeting, in Denver, CO, on May 2 and 3.
- NIH Workshop on Extending Utility of Common Fund Datasets: Meeting to Consider Data Integration via the NIH Data Commons in Rockville, MD, on May 13.
- National Human Genome Research Institute Workshop on Aggregate Genomic Data in Bethesda, MD, on May 19 and 20.
- 2016 Annual NIH Pain Consortium Symposium held in Bethesda, MD, on May 31 and June 1.
- Conference on Evidence-Based Innovation to Support Women in Biomedical Research Careers held in Bethesda, MD, on June 6.
- Fourth Artificial Pancreas Workshop: Testing and Adoption of Current and Emerging Technologies, held at NIH in Bethesda, MD, on June 6 and 7.
- Precision Medicine Initiative kick-off meeting held in Bethesda, MD, on July 6 to 8.
- Point-of-Care Technology Research Network Science Symposium, held in Bethesda, MD, on June 9.
- Annual Meeting of the International Society for Stem Cell Research held in San Francisco, CA, on June 22 to 25.
- The Drug Information Association Annual Meeting held in Philadelphia, PA on June 26 to 30.
- NIH & FDA Glycoscience Research Day held in Bethesda, MD on June 29.
- NIH Blueprint Neurotherapeutics Network External Oversight Committee meeting held in Rockville, MD, on July 14.
- Annual Meeting of the Society for Craniofacial Genetics and Developmental Biology in Boston, MA, on August 3 and 4.

Training and Career Development News

Outreach

The NIDCR Research Training and Career Development Branch (RTCDB) reaches out to the community through conferences, meetings, and workshops to develop research training programs and to encourage predoctoral students, postdoctoral fellows, and junior investigators to apply for NIDCR research training and career development awards.

- On May 13, Leslie Frieden, PhD, RTCDB extramural training officer, participated in a “Meet the Experts 1:1” session at the NIH regional seminar in Baltimore, MD.
- On June 15, Lynn King, PhD, chief of RTCDB, and Dr. Frieden, accompanied by Ms. Dede Rutberg, the NIDCR grants management officer, performed programmatic outreach and a site visit of the NIDCR-supported T32 Craniofacial Oral-biology Student Training in Academic Research (COSTAR) training program at the University of Texas Health Science Center at San Antonio (UTHSC-SA) School of Dentistry. During the visit, NIDCR staff met with the COSTAR program director, steering committee members, leadership of the UTHSC-SA graduate program and dental school, and grant administrators. Students gave short presentations on their research, and Drs. King and Frieden presented on NIDCR funding opportunities and research career pathways. They met one-on-one with predoctoral and postdoctoral students and junior faculty, including trainees supported on the NIDCR institutional T32 training grant, F and K awardees, and potential applicants.

Grant Writing for Postdoctoral Fellows
Deborah Philp, PhD, director of the NIDCR Office of Education, supports the career development of our postdoctoral community. Two recent training events were co-hosted by NIDCR, National Eye Institute, National Human Genome Research Institute, National Institute of Child Health and Development, and National Institute of Arthritis and Musculoskeletal and Skin Diseases:

- In May, four NIDCR trainees were selected to participate in a grant-writing course titled "NIH Grant Writing Course - An In-Depth Workshop." It was led by Paula Gregory, PhD, who is an associate professor in the Department of Genetics at Louisiana State University. The course provided its participants the opportunity to write a rough draft of an NIH grant using their own data. The course instructor reviewed bi-weekly writing assignments. The trainees also participated in a mock NIH grant study section and scored actual NIH grant applications that had been previously reviewed. They learned about the key aspects of a successful application.
- In July, 70 participants were part of the annual grant-writing seminar from Grant Writers' Seminars and Workshops, LLC. The morning session was a seminar on the key changes in preparation of NIH applications. The participants were led through interactive exercises on how to write and submit a successful research grant application using the latest NIH guidelines to grant submission. The presenter also discussed possible pitfalls that they may encounter and good draft review strategies. The afternoon session was a smaller workshop on developing the specific aims portion of a grant. There were six participants in this session (two from NIDCR). Participants in this workshop submitted drafts of their project specific aims prior to the session for critique. Each reviewed draft was discussed with the group during this session.

Science Communication Competition
In July, the NIDCR Office of Education held its inaugural participation in the Three Minute Talk Science Communication Competition at NIH. Fourteen graduate students, postdoctoral fellows, and clinical fellows from three institutes competed as finalists in this event: four from NIDCR, five from NHGRI, and five from NICHD. Participants in this session received professional training on how to effectively communicate their scientific research to a broad scientific audience using a single presentation slide. They attended two training sessions led by the Alan Alda Center for Communicating Science and had two one-on-one professional coaching sessions in public speaking. A panel of distinguished judges — including NIDCR Senior Investigator Matthew Hoffman, BDS, PhD —scored each presentation. The top three presentations received travel awards: NHGRI (first place), NIDCR (second place), and NICHD (third place).

NIH High School Scientific Training and Enrichment Program
The goal of the NIH High School Scientific Training and Enrichment Program (HISTEP) is to expand the pipeline of students interested in biomedical and healthcare careers by expanding opportunities for high school students from schools with a large population of financially disadvantaged students. High school sophomores, juniors, and seniors interested in STEM-M (science, technology, engineering, mathematics, and medically-related) fields participated in a five-week summer program that allowed students to explore scientific research and current topics in human health disparities. These students also received coaching in college preparation and career advising.

NIDCR Summer Program
This summer, 28 high school, undergraduate, dental, and medical students were participants in the 2016 NIH Summer Internship Program. Nine of these students were NIDCR Summer Dental Student Award (SDSA) recipients. There were also two HISTEP 2.0 students, one Community College Summer Enrichment Program student (CCSEP), and one Amgen Scholar. The Office of Education provided summer internship opportunities for two outstanding students from underrepresented groups in biomedical research as a part of this group. These students pursued internships at NIH as a direct result of either meeting Dr. Philp at a minority student conference or discussing training opportunities with other recruiting staff from NIH at different venues. Highlights of this year's summer activities included the summer student research introduction and welcome reception, field trips to the Samuel D. Harris National Dental Museum and the University of Maryland Baltimore Dental School to hear research presentations from students participating in their program, a career panel discussion on "Future Careers in Oral Health Research and Dentistry" (described on page 1 of this report), summer project oral presentations by three

of our summer dental students for the NIDCR research community, and participation in the NIDCR and NIH Poster Day sessions.

Highlights of Trainee Scientific Achievements

Trainees Who Have Achieved Subsequent NIH Grants

First R01/U01s

- **I-Ping Chen, DDS, PhD,** former NIDCR Dentist Scientist K99/R00 awardee, assistant professor, Department of Oral Health and Diagnostic Sciences, University of Connecticut Health Center, NIDCR R01, "Pathogenic Mechanisms of Craniometaphyseal Dysplasia."
- **Josephine Esquivel-Upshaw, DMD**, former NIDCR K23 awardee, associate professor, Department of Restorative Dental Sciences, University of Florida, NIDCR R01, "Novel coatings to minimize surface degradation and fracture susceptibility of dental ceramics."
- **Rodrigo Lacruz, PhD,** NIDCR K99/R00 awardee, assistant professor, Department of Basic Science & Craniofacial Biology, New York University, NIDCR R01 "Calcium Control of Enamel Development"
- **Jaclyn Schwartz, PhD,** former NIDCR T32 predoctoral Trainee, assistant professor, Department of Psychological and Brain Sciences, University of Delaware, NIMH R01, "Impact of Neonatal Infection on the Development of Hippocampal-Dependent Learning."

Pathway to Independence Awards (K99/R00)

The following investigators have transitioned to tenure track research faculty positions (R00 phase):

- **Anna Edlund, PhD,** assistant professor, Department of Genomic Medicine, J. Craig Venter Institute, R00: "Investigating Oral Pathogen Virulence within Complex Oral Biofilm Communities."
- **Erica Scheller, DDS, PhD**, assistant professor, Division of Bone & Mineral Disease, Washington University, R00: "Neural regulation of skeletal biology and periodontal disease progression in type 1 diabetes."

Transitions from Institutional Training Grant Support to Individual Awards

NIDCR strongly encourages trainees supported on institutional training grants to apply for and achieve individual fellowships or career development awards.

- **Yizu Jiao, MD, PhD**, University of North Carolina, Chapel Hill, NIDCR F32 postdoctoral fellowship, "The Role of IL-37b from Plasma Cells in Periodontitis Pathogenesis."
- **Alexis Lainoff**, University of California San Francisco, NIDCR F31 predoctoral fellowship to support PhD training, "Cell biological determinants underlying phenotypic severity of holoprosencephaly."
- **David Manz**, University of Connecticut, NIDCR F30 predoctoral fellowship to support dual degree DMD-PhD training, "Role of Ferroportin in reducing Prostate Cancer Metastasis."
- **Joe Nguyen,** University of Michigan, NIDCR F30 predoctoral fellowship to support dual degree DDS-PhD training, "DNA damage activates non-canonical mTORC1 signaling through mammalian EAK-7 in HNSCC."
- **Jennifer Robinson**, **PhD,** Columbia University, NIDCR F32 postdoctoral fellowship, "Role of Estrogen via Estrogen Receptor Alpha on TMJ Chondrogenesis and Homeostasis."
- **Caroline Sawicki**, Ohio State University, NIDCR F30 predoctoral fellowship to support dual degree DDS-PhD training, "The Role of Reactive Brain Endothelium in Modulating Stress-Induced Immunological and Behavioral Changes."
- **Gabriella Szewczyk,** University of Illinois at Chicago, NIDCR F30 predoctoral fellowship to support dual degree DDS-PhD training, "Virulence Outcomes Pertaining to Streptococcus mutans' Social Interactions."

- **Sarah Wong,** University of California San Francisco, NIDCR F30 predoctoral fellowship to support dual degree DDS-PhD training, “Canonical Wnt Signaling as a Novel Regulator of Chondrocyte to Osteoblast Transdifferentiation during Endochondral Bone Repair in the Mandible.”
- **Matthew Zambrello,** University of Connecticut, NIDCR F30 predoctoral fellowship to support dual degree DMD-PhD training, “Novel Computational Techniques to Expand the Scope of Protein Nuclear Magnetic Resonance Spectroscopy.”

Recent Publications from Trainees

F Fellows

- **Herbert BA,** Novince CM, Kirkwood KL. Aggregatibacter actinomycetemcomitans, a potent immunoregulator of the periodontal host defense system and alveolar bone homeostasis. Mol Oral Microbiol. 2016 Jun;31(3):207-27.
- **Jacox L,** Chen J, Rothman A, Lathrop-Marshall H, Sive H. Formation of a "Pre-mouth Array" from the Extreme Anterior Domain Is Directed by Neural Crest and Wnt/PCP Signaling. Cell Rep. 2016 Aug 2;16(5):1445-1455.
- **Kumar VA,** Liu Q, Wickremasinghe NC, Shi S, Cornwright TT, Deng Y, Azares A, Moore AN, Acevedo-Jake AM, Agudo NR, Pan S, Woodside DG, Vanderslice P, Willerson JT, Dixon RA, Hartgerink JD. Treatment of hind limb ischemia using angiogenic peptide nanofibers. Biomaterials. 2016 Aug;98:113-9.
- **Miller DP**, Oliver LD Jr, Tegels BK, Reed LA, O'Bier NS, Kurniyati K, Faust LA, Lawson CK, Allard AM, Caimano MJ, Marconi RT. The Treponema denticola FhbB Protein Is a Dominant Early Antigen That Elicits FhbB Variant-Specific Antibodies That Block Factor H Binding and Cleavage by Dentilisin. Infect Immun. 2016 Jun 23;84(7):2051-8.
- **Noack Watt KE**, Achilleos A, Neben CL, Merrill AE, Trainor PA. The Roles of RNA Polymerase I and III Subunits Polr1c and Polr1d in Craniofacial Development and in Zebrafish Models of Treacher Collins Syndrome. PLoS Genet. 2016 Jul 22;12(7):e1006187.
- **Powder KE,** Albertson RC. Cichlid fishes as a model to understand normal and clinical craniofacial variation. Dev Biol. 2016 Jul 15;415(2):338-46.
- **Stacy A**, Fleming D, Lamont RJ, Rumbaugh KP, Whiteley M. A Commensal Bacterium Promotes Virulence of an Opportunistic Pathogen via Cross-Respiration. MBio. 2016 Jun 28;7(3). pii: e00782-16.
- **Van Otterloo E**, Feng W, Jones KL, Hynes NE, Clouthier DE, Niswander L, Williams T. MEMO1 drives cranial endochondral ossification and palatogenesis. Dev Biol. 2016 Jul 15;415(2):278-95.

Institutional Training Grant (T15/T32/T90/R90) Trainees and K12 Scholars

- **Akinkugbe AA,** Sharma S, Ohrbach R, Slade GD, Poole C. Directed Acyclic Graphs for Oral Disease Research. J Dent Res. 2016 Jul;95(8):853-9.
- **Carrion B,** Souzanchi MF, Wang VT, Tiruchinapally G, Shikanov A, Putnam AJ, Coleman RM. The Synergistic Effects of Matrix Stiffness and Composition on the Response of Chondroprogenitor Cells in a 3D Precondensation Microenvironment. Adv Healthc Mater. 2016 May;5(10):1192-202.
- **Byrd KM**, Lough KJ, Patel JH, Descovich CP, Curtis TA, Williams SE. LGN plays distinct roles in oral epithelial stratification, filiform papilla morphogenesis and hair follicle development. Development. 2016 Aug 1;143(15):2803-17.
- **Carney MN,** Johnston WM. A novel regression model from RGB image data to spectroradiometric correlates optimized for tooth colored shades. J Dent. 2016 Aug;51:45-8.
- **Cass AA,** Bahn JH, Lee JH, Greer C, Lin X, Kim Y, Hsiao YH, Xiao X. Global analyses of endonucleolytic cleavage in mammals reveal expanded repertoires of cleavage-inducing small RNAs and their targets. Nucleic Acids Res. 2016 Apr 20;44(7):3253-63.
- **Chen Y,** Fang Q, Wang Z, Zhang JY, MacLeod AS, Hall RP, Liedtke WB. Transient Receptor Potential Vanilloid 4 Ion Channel Functions as a Pruriceptor in Epidermal Keratinocytes to Evoke Histaminergic Itch. J Biol Chem. 2016 May 6;291(19):10252-62

- **Galicia** JC, Henson BR, Parker JS, Khan AA. Gene expression profile of pulpitis. Genes Immun. 2016 Jun;17(4):239-43.
- **Gardinier JD**, Al-Omaishi S, Morris MD, Kohn DH. PTH signaling mediates perilacunar remodeling during exercise. Matrix Biol. 2016 May-Jul;52-54:162-75.
- **Marinkovic M**, Block TJ, Rakian R, Li Q, Wang E, Reilly MA, Dean DD, Chen XD. One size does not fit all: developing a cell-specific niche for in vitro study of cell behavior. Matrix Biol. 2016 May-Jul;52-54:426-41.
- **McKim DB**, Patterson JM, Wohleb ES, Jarrett BL, Reader BF, Godbout JP, Sheridan JF. Sympathetic Release of Splenic Monocytes Promotes Recurring Anxiety Following Repeated Social Defeat. Biol Psychiatry. 2016 May 15;79(10):803-13.
- **Rice AJ,** Woo JK, Khan A, Szypulinski MZ, Johnson ME, Lee H, Lee H. Over-expression, purification, and confirmation of Bacillus anthracis transcriptional regulator NprR. Protein Expr Purif. 2016 Sep;125:83-9.
- **Shin JM**, Gwak JW, Kamarajan P, Fenno JC, Rickard AH, Kapila YL. Biomedical applications of nisin. J Appl Microbiol. 2016 Jun;120(6):1449-65.

K Awardees

- Ansari S, Chen C, Xu X, Annabi N, Zadeh HH, Wu BM, Khademhosseini A, Shi S, **Moshaverinia A.** Muscle Tissue Engineering Using Gingival Mesenchymal Stem Cells Encapsulated in Alginate Hydrogels Containing Multiple Growth Factors. Ann Biomed Eng. 2016 Jun;44(6):1908-20.
- **Chi DL,** Momany ET, Mancl LA, Lindgren SD, Zinner SH, Steinman KJ. Dental Homes for Children With Autism: A Longitudinal Analysis of Iowa Medicaid's I-Smile Program. Am J Prev Med. 2016 May;50(5):609-15.
- Momeni A, Rapp S, Donneys A, Buchman SR, **Wan DC.** Clinical Use of Deferoxamine in Distraction Osteogenesis of Irradiated Bone. J Craniofac Surg. 2016 Jun;27(4):880-2.
- **Scheller EL,** Cawthorn WP, Burr AA, Horowitz MC, MacDougald OA. Marrow Adipose Tissue: Trimming the Fat. Trends Endocrinol Metab. 2016 Jun;27(6):392-403.
- **Sima C**, Aboodi GM, Lakschevitz FS, Sun C, Goldberg MB, Glogauer M. Nuclear Factor Erythroid 2-Related Factor 2 Down-Regulation in Oral Neutrophils Is Associated with Periodontal Oxidative Damage and Severe Chronic Periodontitis. Am J Pathol. 2016 Jun;186(6):1417-26.
- **Simoes-Costa M**, Bronner ME. Reprogramming of avian neural crest axial identity and cell fate. Science. 2016 Jun 24;352(6293):1570-3.
- **Tiwari T**, Scarbro S, Bryant LL, Puma J. Factors Associated with Tooth Loss in Older Adults in Rural Colorado. J Community Health. 2016 Jun;41(3):476-81.

PUBLICATIONS

Selected Extramurally Funded Science Advances

High Impact Findings from Seasoned Investigators

During the last four months, 347 extramurally funded studies were published in the scientific literature. Below is a list of the most important papers published from each program area.

Behavioral and Social Science Research

Maramaldi P, Walji MF, White J, Etolue J, Kahn M, Vaderhobli R, Kwatra J, Delattre VF, Hebballi NB, Stewart D, Kent K, Yansane A, Ramoni RB, Kalenderian E. How dental team members describe adverse events. J Am Dent Assoc. 2016 Jun 3. Pii: S0002-8177(16)30371-3. doi: 10.1016/j.adaj.2016.04.015. [Epub ahead of print].

Collett BR, Huebner CE, Seminario AL, Wallace E, Gray KE, Speltz ML. Observed child and parent toothbrushing behaviors and child oral health. Int J Paediatr Dent. 2016 May ;26(3):184-92.

Boissoneault J, Mundt JM, Bartley EJ, Wandner LD, Hirsh AT, Robinson ME. Assessment of the Influence of Demographic and Professional Characteristics on Health Care Providers' Pain Management Decisions Using Virtual Humans. J Dent Educ. 2016 May;80(5):578-87.

Lin L, Chu H, and Hodges JS. Sensitivity to Excluding Treatments in Network Meta-analysis. Epidemiology. 2016 Jul;27(4):562-9.

Lin L, Chu H, and Hodges JS. Alternative measures of between-study heterogeneity in meta-analysis: Reducing the impact of outlying studies. Biometrics. 2016 May 11. [Epub ahead of print].

Brega AG, Thomas JF, Henderson WG, Batliner TS, Quissell DO, Braun PA, Wilson A, Bryant LL, Nadeau KJ, Albino J. Association of parental health literacy with oral health of Navajo Nation preschoolers. Health Educ Res. 2016 Feb;31(1):70-81.

Broder HL, Flores RL, Clouston S, Kirschner RE, Garfinkle JS, Sischo L, Phillips C. Surgeon's and Caregivers' Appraisals of Primary Cleft Lip Treatment with and without Nasoalveolar Molding: A Prospective Multicenter Pilot Study. Plast Reconstr Surg. 2016 Mar;137(3):938-45.

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Center Clinical Research

Warren JJ, Fontana M, Blanchette DR, Dawson DV, Drake DR, Levy SM, Kolker JL, Phipps KR. Timing of primary tooth emergence among U.S. racial and ethnic groups. J Public Health Dent. 2016 Mar 18. doi: 10.1111/jphd.12154. [Epub ahead of print].

Macek MD, Atchison KA, Watson MR, Holtzman J, Wells W, Braun B, Aldoory L, Messadi D, Gironda M, Haynes D, Parker RM, Chen H, Coller S, Richards. Assessing health literacy and oral health: preliminary results of a multi-site investigation. J Public Health Dent. 2016 Apr 29. doi: 10.1111/jphd.12156. [Epub ahead of print].

Burgette JM, Lee JY, Baker AD, Vann WF Jr. Is Dental Utilization Associated with Oral Health Literacy? J Dent Res. 2016 Feb;95(2):160-6. doi: 10.1177/0022034515617457. Epub 2015 Nov 13.

Dooley D, Moultrie NM, Heckman B, Gansky SA, Potter MB, Walsh MM. Oral health prevention and toddler well-child care: routine integration in a safety net system. Pediatrics. 2016 Jan;137(1). doi: 10.1542/peds.2014-3532. Epub 2015 Dec 8.

Pavlesen S, Mai X, Wactawski-Wende J, LaMonte MJ, Hovey KM, Genco RJ, Millen AE. Vitamin D status and prevalent and incident tooth loss in postmenopausal women: the Buffalo Osteoporosis and Periodontal Disease (OsteoPerio) Study. J Periodontol. 2016 Apr 18:1-17. [Epub ahead of print].

Goh CE, Kopp J, Papapanou PN, Molitor JA, Demmer RT. Association between serum antibodies to periodontal bacteria and rheumatoid factor in NHANES III. Arthritis Rheumatol. 2016 Apr 25. doi: 10.1002/art.39724. [Epub ahead of print].

Kossatz S, Brand C, Gutiontov S, Liu JT, Lee NY, Gönen M, Weber WA, Reiner T. Detection and delineation of oral cancer with a PARP1 targeted optical imaging agent. Sci Rep. 2016 Feb 22;6:21371. doi: 10.1038/srep21371.

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Integrative Biology and Infectious Diseases

Koues OI, Collins PL, Cella M, Robinette ML, Porter SI, Pyfrom SC, Payton JE, Colonna M, Oltz EM. Distinct Gene Regulatory Pathways for Human Innate versus Adaptive Lymphoid Cells. Cell. 2016 May 19;165(5): 1134-46.

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Zhao Q, Lee DW, Ahn BK, Seo S, Kaufman Y, Israelachvili JN, Waite JH. Underwater contact adhesion and microarchitecture in polyelectrolyte complexes actuated by solvent exchange. Nat Mater. 2016 Apr; 15(4):407-12.

Bhumiratana S, Bernhard JC, Alfi DM, Yeager K, Eton RE, Bova J, Shah F, Gimble JM, Lopez MJ, Eisig SB, Vunjak-Novakovic G. Tissue-engineered autologous grafts for facial bone reconstruction. Sci Transl Med. 2016 June 15;8(343):343ra83.

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Guo W, Chu YX, Imai S, Yang JL, Zou S, Mohammad Z, Wei F, Dubner R, Ren K. Further observations on the behavioral and neural effects of bone marrow stromal cells in rodent pain models. Mol Pain. 2016 Jun 21;12. pii: 1744806916658043. doi: 10.1177/1744806916658043. Print 2016 Feb.

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Huang X, Palmer SR, Ahn S-J, Richards VP, Williams ML, Nascimento MM, Burne RA. A highly arginolytic Streptococcus species that potently antagonizes *Streptococcus mutans*. Appl Environ Microbiol. 2016 Jan 29;82(7):2187-201. doi: 10.1128/AEM.03887-15.

Translational Genomics Research Branch

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FUNDING UPDATE

Program Announcements

Innovation Corps (I-Corps) at NIH Program for NIH and CDC Phase I Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Grantees (Admin Supp)

NIDCR Small Grant Program for New Investigators (R03)

NIDCR Small Research Grants for Secondary Analysis of FaceBase Data (R03)

Small Research Grants for Analyses of Data for the Gabriella Miller Kids First Data Resource (R03)

Small Research Grants for Establishing Basic Science-Clinical Collaborations to Understand Structural Birth Defects (R03)

Administrative Supplements for Research on Dietary Supplements (Admin Supp)

NIDCR Mentored Career Development Award to Promote Diversity in the Dental, Oral and Craniofacial Research Workforce (K01)

PHS 2016-02 Omnibus Solicitation of the NIH, CDC, FDA and ACF for Small Business Innovation Research Grant Applications (Parent SBIR [R43/R44])

PHS 2016-02 Omnibus Solicitation of the NIH for Small Business Technology Transfer Grant Applications (Parent STTR [R41/R42])

Ruth L. Kirschstein National Research Service Award (NRSA) Fellowship for Students at Institutions With NIH-Funded Institutional Predoctoral Dual-Degree Training Programs (Parent F30)

Ruth L. Kirschstein National Research Service Award (NRSA) Fellowship for Students at Institutions Without NIH-Funded Institutional Predoctoral Dual-Degree Training Programs (Parent F30)

Ruth L. Kirschstein National Research Service Award (NRSA) Individual Postdoctoral Fellowship (Parent F32)

Ruth L. Kirschstein National Research Service Award Individual Predoctoral Fellowship to Promote Diversity in Health-Related Research (Parent F31 - Diversity)

Ruth L. Kirschstein National Research Service Award (NRSA) Individual Predoctoral Fellowship (Parent F31)

Ruth L. Kirschstein National Research Service Award (NRSA) Individual Senior Fellowship (Parent F33)

Factors Underlying Differences in Female and Male Presentation for Dental, Oral, and Craniofacial Diseases and Conditions (R01)

Factors Underlying Differences in Female and Male Presentation for Dental, Oral, and Craniofacial Diseases and Conditions (R21)

Native American Research Centers for Health (NARCH) (S06)

NIH Support for Conferences and Scientific Meetings (Parent R13)

Change of Grantee Organization (Type 7 Parent)

Successor-in-Interest (Type 6 Parent)

Administrative Supplements to Existing NIH Grants and Cooperative Agreements (Admin Supp)

Research Supplements to Promote Re-Entry into Biomedical and Behavioral Research Careers (Admin Supp)

Dissemination and Implementation Research in Health (R21)

Dissemination and Implementation Research in Health (R03)

Dissemination and Implementation Research in Health (R01)

Bioengineering Research Grants (BRG) (R01)

Requests for Applications

Big Data to Knowledge (BD2K) Enhancing the Efficiency and Effectiveness of Digital Curation for Biomedical Big Data (U01)

Big Data to Knowledge (BD2K) Community-based Data and Metadata Standards Efforts (R24)

Human Heredity and Health in Africa (H3Africa): Informatics Network (U24)

Human Heredity and Health in Africa (H3Africa): Global Health Bioinformatics Research Training Program (U2R)

Human Heredity and Health in Africa (H3Africa): Ethical, Legal, and Societal Issues (ELSI) Research Program (U01)

Human Heredity and Health in Africa (H3Africa): Ethical, Legal, and Societal Issues (ELSI) Collaborative Centers (U54)

Human Heredity and Health in Africa (H3Africa): Research Projects (U01)

Human Heredity and Health in Africa (H3 Africa): Collaborative Centers (U54)

Human Heredity and Health in Africa (H3Africa): Coordinating Center (U24)

Limited Competition: NIDCR Supplements to NCATS CTSA Programs for Scholars Pursing Dental, Oral and Craniofacial Clinical and Translational Research Career Development (Admin Supp)

Biosensors in the Oral Cavity (R01)

Biosensors in the Oral Cavity (R21)

BD2K Research Education Curriculum Development: Data Science Overview for Biomedical Scientists (R25)

NIH Big Data to Knowledge (BD2K) Enhancing Diversity in Biomedical Data Science (R25)

BD2K Open Educational Resources for Skills Development in Biomedical Big Data Science (R25)

BD2K Predoctoral Training in Biomedical Big Data Science (T32)