

Director's Report to the National Advisory Dental and Craniofacial Research Council January 2021

HHS/NIH UPDATE

HHS Launches Central Website for COVID-19 Clinical Trials. In collaboration with NIH and Operation Warp Speed, HHS has launched a centralized web portal called [Combat COVID](#). This one-stop resource is designed to help health care providers and the public find easy-to-understand information about how to participate in NIH-supported COVID-19 prevention and treatment clinical trials, locations to donate plasma, and access to current treatment guidelines for clinicians. The site also includes clear descriptions of the science behind COVID-19 vaccines and notes the importance of enrolling diverse participants in COVID-19 studies.

NIH Funds Community Engagement Efforts in Areas Hardest Hit by COVID-19. NIH announced a \$12 million award for outreach and engagement efforts in ethnic and racial minority communities disproportionately affected by the COVID-19 pandemic, particularly African Americans, Hispanics/Latinos, and American Indians. The NIH-wide effort is led by the National Institute on Minority Health and Health Disparities and the National Heart, Lung, and Blood Institute. The scientific teams will focus on COVID-19 awareness and education research and will promote and facilitate the participation of individuals from underserved communities in vaccine and therapeutic clinical trials.

NIH Expands Research to Improve COVID-19 Testing in Underserved Communities. NIH has awarded more than \$283 million to improve COVID-19 testing for underserved and vulnerable populations disproportionately affected by the pandemic. Part of the Rapid Acceleration of Diagnostics (RADx) initiative, the RADx Underserved Populations (RADx-UP) program supports 55 institutions across the nation to better understand COVID-19 testing patterns, with the aim of increasing availability, accessibility, and acceptance of testing in underserved communities.

NIH Funds Recruiting Efforts to Enhance Diversity and Inclusion. NIH announced an estimated budget of \$241 million to support biomedical research institutions' recruitment of early-stage biomedical research faculty from underrepresented groups, including racial and ethnic minorities, individuals with disabilities, individuals from disadvantaged backgrounds, and women. The funding is part of the NIH Common Fund's [Faculty Institutional Recruitment for Sustainable Transformation](#) (FIRST) program.

NIH Announces Restructured HIV Clinical Trials Networks. The National Institute of Allergy and Infectious Diseases announced a new, streamlined structure for the NIH HIV clinical trials networks. The new structure consists of four collaborative networks that will direct clinical research in the areas of HIV prevention; HIV vaccines; HIV/AIDS adult therapeutics; and HIV/AIDS maternal, adolescent, and pediatric populations. NIAID and co-funding NIH institutes, including NIDCR, intend to collectively provide about \$375.3 million to support the networks in the first year. NIDCR will contribute funding and scientific expertise to a network component dedicated to HIV vaccine research.

NIH Announces 2020 High-Risk, High-Reward Research Grants. NIH awarded 85 grants through its High-Risk, High-Reward Research Program. The awards provide five years of support to scientists with trailblazing ideas that feature highly innovative and impactful biomedical or behavioral research.

Among the recipients is Mekhail Anwar, MD, PhD, who was awarded the [NIH Director's New Innovator Award](#) for early career investigators, funded by NIDCR and the NIH Common Fund. Anwar will work to develop an implantable wireless device for real-time monitoring of tumor responses to therapeutics.

[NIH Offers Resources for Combating Harassment in Workplace.](#) NIH has developed a suite of six products to help grantee institutions implement assessments and design interventions for combatting harassment and fostering positive work environments. The products are based on results from NIH's Workplace Climate and Harassment Survey, administered in 2019 to NIH staff to help institutes assess the workplace climate and inform strategies to improve workplace experiences. By sharing the survey report and other products, NIH hopes to make the findings accessible and actionable for the wider biomedical research community.

[Surge of Teen Vaping Slows But Remains High.](#) The use of vaped marijuana and nicotine among teens did not increase from 2019 to early 2020, although they remain high, according to findings from the most recent Monitoring the Future survey, funded by the National Institute on Drug Abuse and given annually to teens and young adults. Earlier results had shown that nicotine and marijuana vaping among high-school aged teens roughly doubled from 2017 to 2019, and [more than doubled among college-age adults](#). The increase among college-age adults is among the largest for any substance reported by the 45-year-old study.

[Heritable Human Genome Editing Not Ready for Clinical Applications.](#) In a blog post, Dr. Collins described results from an NIH-sponsored consensus study issued by a commission convened by the US National Academy of Sciences, US National Academy of Medicine, and the UK Royal Society. The expert panel, representing 10 nations and 4 continents, concluded that heritable genome editing technology – used to make changes to the genetic material of eggs, sperm, or any cells that lead to their development, including the cells of early embryos, and establishing a pregnancy – is not yet safe or technologically reliable for testing in any clinical application in humans. The commission recommended establishing an international scientific advisory board to monitor the rapidly evolving state of genome editing technologies.

[Harvey Alter Wins Nobel Prize.](#) Harvey J. Alter, MD, a senior scholar at the NIH Clinical Center, won the 2020 Nobel Prize in Physiology or Medicine for his contributions to the discovery of the hepatitis C virus in the 1980s, sharing the award with Michael Houghton, PhD, University of Alberta, Canada, and Charles M. Rice, PhD, of Rockefeller University. Alter's work to define the nature of the hepatitis C virus has led to advances in new diagnostics and therapeutics, as well as blood donor screening programs that have virtually eliminated the incidence of transfusion-transmitted hepatitis.

[Director of the NIH Office of Equity, Diversity, and Inclusion Departs.](#) After an eight-year tenure at NIH, Debra C. Chew, Esq., left her position as director of the NIH Office of Equity, Diversity, and Inclusion (EDI) to join the Federal Housing Finance Administration in September. Chew's accomplishments included leadership of initiatives to collect workforce demographic data for diversity analysis, efforts to eliminate barriers to equal employment, and launch of a Safe Zone Training to provide allyship and awareness of issues facing the sexual and gender minority population at NIH. Treaya Hopkins-Laboy, who served for the past eight years as EDI's deputy director, will step in as the acting director while a nationwide search for Chew's replacement takes place.

[NIH's Chief Officer of Scientific Workforce Diversity Retires.](#) Hannah A. Valentine, MD, retired from NIH as chief officer of the Scientific Workforce Diversity Office in September. During her tenure at NIH, Valentine established the Distinguished Scholars Program and NIH Equity Committee to enhance the representation of minorities in the intramural program. Dr. Collins issued a statement highlighting her work on “carrying out a comprehensive strategy for promoting inclusiveness and equity throughout the biomedical research enterprise” since joining NIH in 2014.

NIDCR UPDATE

Institute News

[NIDCR Welcomes New Director Rena D'Souza.](#) Rena N. D'Souza, DDS, MS, PhD, was sworn in as the director of NIDCR by NIH Director Francis S. Collins, MD, PhD, on October 13. Prior to joining NIH, Dr. D'Souza was the assistant vice president for academic affairs and education for health sciences at the University of Utah, Salt Lake City. In Dr. D'Souza's [video message](#) to the NIDCR community, she described her appointment as “the greatest privilege of my career,” emphasizing her commitment to continue the institute's mission to improve dental, oral, and craniofacial health for all.

[NIDCR Plays Active Role in COVID-19 Response.](#) NIDCR is supporting diverse research strategies to better understand COVID-19 in the context of dental, oral, and craniofacial health. Through its extramural programs, the institute has issued \$3.8 million in supplemental funding for basic and clinical studies, some of which are conducted through the [National Dental Practice Based Research Network](#). These [projects](#) address a range of topics, including minimizing infection risk in dental environments, improving SARS-CoV-2 detection in saliva, and exploring mechanisms of viral entry into oral cells. More recently, as part of the Rapid Acceleration of Diagnostics Radical (RADx-rad) program, [NIH announced](#) over \$107 million in funding for non-traditional and repurposed technologies for COVID-19 testing and surveillance. NIDCR administers six of these projects, which range from a “smart mask” that changes color when exposed to the SARS-CoV-2 virus, to a breathalyzer that detects the virus from exhaled breath, and more. More information, including details about ongoing research, COVID-19-related funding opportunities, and CDC guidance for dental settings, can be found on NIDCR's COVID-19 [webpage](#).

[NIDCR Researchers Named 2020 NIH Lasker Scholars.](#) In November, NIH announced five new Lasker Clinical Research Scholars, including NIDCR researchers Alison Boyce, MD, and Jacqueline Mays, DDS, PhD, MD. The Lasker program supports a small number of exceptional clinical researchers in the early stages of their careers to promote their advancement to fully independent positions. Boyce is searching for treatments for fibrous dysplasia/McCune-Albright syndrome, a rare and debilitating skeletal disease. Mays is working to understand the immune processes underlying oral chronic graft-versus-host disease to find better interventions for the condition.

[NIDCR Contributes to Renewal of Science of Behavior Change Program.](#) NIDCR is among seven NIH institutes, centers, and offices providing support for the renewal of the 10-year-old Science of Behavior Change (SOBC) program, formerly sponsored by the NIH Common Fund. In a recent Q&A, Melissa Riddle, PhD, director of NIDCR's Behavioral and Social Sciences Research Program, highlighted the program's progress in supporting mechanisms-focused research to understand how and why people adopt and

sustain healthy behaviors. To mark its tenth year and explore future visions, an [SOBC Capstone Conference](#) will be held virtually February 22 and 23 of 2021.

NIDCR-Supported Science Advances

Stem Cell Treatment Corrects Craniosynostosis in Mice. Using stem cells to regenerate parts of the skull, scientists corrected skull shape and reversed learning and memory deficits in young mice with craniosynostosis, a condition estimated to affect 1 in every 2,500 infants born in the United States. The study could pave the way for more effective and less invasive therapies for children with the condition.

NIDCR-Funded Study on Pain Suppression Featured as NIH 2020 Research Highlight. An NIDCR-funded study is featured among *NIH Research Matters'* annual list of noteworthy advances in NIH-supported fundamental research for 2020. Published in June, [the study reports](#) the identification of a group of neurons in mice that blunt pain by dampening the activity of multiple pain-processing regions of the brain. The neurons could be promising targets for new non-addictive therapies for chronic pain.

New Insight into the Neural Basis of Touch. When a breeze crosses our face on a windy day, our sense of touch provides many details: the wind's strength, its warmth or coolness, its direction, and more. NIDCR researchers and a team from NIH's National Center for Complementary and Integrative Health identified how groups of neurons in mice work together to orchestrate these intricacies of touch. The findings could help scientists better understand sensory- and pain-related disorders in humans.

New Inflammatory Disease Discovered. A team co-led by scientists from NIDCR, the National Institute of Arthritis and Musculoskeletal and Skin Diseases, and the National Human Genome Research Institute, discovered a new, often-fatal inflammatory disorder characterized by blood clots in veins, fevers and lung abnormalities. The new disease is known as VEXAS (vacuoles, E1 enzyme, X-linked, autoinflammatory, somatic) syndrome. In a group of patients with undiagnosed diseases, the team looked for mutations related to the process of ubiquitylation, which helps determine the function of proteins made by a cell and is thought to play a role in some inflammatory diseases. Twenty-five of the patients had mutations in one such gene and shared the symptoms of the new disease. The results may help scientists find treatments for VEXAS and other inflammation-related conditions.

Exploring AI for Cancer Diagnosis. Researchers trained a deep learning computer program to successfully detect the presence of molecular and genetic alterations based on tumor images across multiple cancer types, including head and neck cancer. The study, supported in part by NIDCR, opens the possibility of faster and more affordable cancer diagnosis that may help clinicians deliver personalized cancer care earlier.

Scientists Drill Down on Bacteria-Fighting Fillings. Aided by artificial intelligence, scientists designed a dental adhesive with bacteria-fighting properties. This NIDCR-supported research might one day lead to longer-lasting dental fillings that minimize the need for repeated trips to the dentist.

Personnel Update

Alison Boyce, MD, was selected as a tenure-track Lasker Clinical Research Scholar in the Division of Intramural Research. She specializes in the study and treatment of fibrous dysplasia-McCune Albright syndrome (FD/MAS), a rare and debilitating disorder with no available medical treatments. FD/MAS causes accumulation of skeletal stem cells in bones, replacing normal bone and marrow with fibro-osseous tissue. Dr. Boyce earned her medical degree at Eastern Virginia Medical School and completed her residency training in pediatrics at the Children's Hospital of the King's Daughters in Norfolk, VA. She then completed a 3-year fellowship in the field of pediatric endocrinology in the Program for Developmental Endocrinology and Genetics, NICHD. After completing her training, she became an assistant professor of pediatrics at George Washington University, Children's National Health System, before joining the NIDCR Intramural Research Program as a staff clinician in 2014, from which she was accepted into the Lasker Clinical Research Scholars Program in 2020.

Zhong Chen, MD, PhD, joins NIDCR as the program director of the Oral and Salivary Cancer Biology Program, part of the Integrative Biology and Infectious Diseases Branch in the Division of Extramural Research. She graduated from Beijing Medical University in China and received her PhD in tumor immunology from the University of Rochester, School of Medicine & Dentistry in New York. She finished postdoctoral training in immunotolerance at the Department of Dermatology from the same university. Dr. Chen comes to NIDCR from the intramural program of National Institute on Deafness and Other Communication Disorders (NIDCD), where she was the chief of the Clinical Genomics Unit and a staff scientist in the Tumor Biology Section within the Head and Neck Surgery Branch. Her research at NIDCD crossed various disciplines relating to translational oncology and genomics, including cell and molecular biology, gene expression and transcriptional regulation, high-throughput sequencing, functional genomics, animal tumor models, preclinical and clinical investigation, and new drug testing. She participated in The Cancer Genome Atlas (TCGA) head and neck cancer project and co-chaired the squamous cancers working group of the Pan-Cancer Atlas.