

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

HHS/NIH UPDATE

[Senate Confirms Eric Lander as White House OSTP Director](#). Eric S. Lander, PhD, was confirmed as the 11th director of the White House Office of Science and Technology Policy (OSTP) by the US Senate on May 8. Lander will also serve as the President's science advisor. Prior to joining the White House, Lander served as the founding director of the Broad Institute of the Massachusetts Institute of Technology and Harvard University and was one of the principal leaders of the Human Genome Project. He received his bachelor's degree from Princeton University and his PhD from Oxford University, UK.

[Lander, Collins Set Forth a Vision for ARPA-H](#). In a [commentary](#) published in *Science*, White House OSTP Director Lander, NIH Director Francis S. Collins, MD, PhD, and other leaders describe a vision for a new science entity, the Advanced Research Projects Agency for Health (ARPA-H). Proposed as a distinct division within NIH, ARPA-H would embrace a culture and strategies that encourage bold advances, aiming to accelerate biomedical innovation and adopt technologies and approaches to revolutionize health care and medicine. In one of a series of listening sessions convened by NIH and OSTP, NIH leadership, including NIDCR Director Rena D'Souza, DDS, MS, PhD, [gave presentations and gathered feedback from stakeholders](#) in several disease-related areas, including dental and craniofacial disorders.

[NIH Seeks to Understand "Long COVID"](#). In April, Dr. Collins [testified](#) before the House Energy and Commerce Health Subcommittee regarding NIH's plans to study "long COVID"—a constellation of symptoms that persist in patients after initial SARS-CoV-2 infection. Since Congress appropriated [\\$1.15 billion for this work](#) in December 2020, NIH has been working to design a fast, flexible, and comprehensive research initiative. NIH experts also recently published a paper in the *Annals of Internal Medicine* that outlines [what is known about "long COVID"](#) and the knowledge gaps that need to be addressed in future research.

[NIH Director Testifies Before Senate](#). Dr. Collins and several NIH leaders appeared before the Senate Appropriation Subcommittee on Labor, HHS, Education, and Related Agencies to discuss the fiscal year 2022 NIH budget request. Dr. Collins stated that the proposed \$51 billion budget will continue to fund research addressing the impact of the pandemic and tackle some of our nation's most persistent health challenges, including health disparities, maternal mortality, mental health, and opioid use disorder. In addition, the 2022 budget proposes to establish ARPA-H, which is designed to tackle bold challenges through a non-traditional and nimble approach to high-risk research.

[Adolescent Nicotine Vaping Declined During Pandemic](#). Nicotine vaping in American high school seniors declined during the COVID-19 pandemic, according to results from the annual [Monitoring the Future survey](#) of substance use behaviors among US adolescents. The study, funded by the National Institute on Drug Abuse, suggested that a dip in the perceived supply of vaping devices, the rise of minimum age for vaping product purchases, and news reports on vaping-induced lung injuries may have contributed to the decline. Meanwhile, adolescent marijuana use and binge drinking did not significantly change during the same period.

[Oral & Pharynx Cancer Death Rates Increase in Men](#). The *Annual Report to the Nation on the Status of Cancer*, released in July by the National Cancer Institute and collaborating organizations, found that

overall cancer death rates have continued to decline in men and women for all racial and ethnic groups in the United States. However, oral cavity and pharynx cancer death rates increased for men from 2014 to 2018. The overall cancer incidence rates continued to increase among females, children, and adolescents and young adults.

[Scientists Identify Small-Molecule Cocktail to Improve Stem Cell Use](#). Researchers at the National Center for Advancing Translational Sciences (NCATS) have devised a four-component small-molecule cocktail that can protect stem cells called induced pluripotent stem cells from stress and help them maintain normal structure and function. The researchers showed that the cocktail can improve stem cell survival and quality, enhancing their potential for future use in therapeutic applications and in research, including genome editing.

[Deputy Director for Intramural Research Steps Down](#). After 28 years of service, Michael M. Gottesman, MD, will step down as the NIH deputy director of intramural research and will turn his focus to his work at the NCI, where he is chief of the Laboratory of Cell Biology. During his leadership, Gottesman has coordinated activities and facilitated cooperation to improve research integrity, recruitment, and diversity of the scientific workforce across NIH. Gottesman will remain in the position while NIH undertakes a nationwide search for his replacement.

[Marie Bernard Named Chief Officer for Scientific Workforce Diversity](#). Dr. Collins selected Marie A. Bernard, MD, as NIH's chief officer for scientific workforce diversity (COSWD) after a nationwide search. A geriatrician, Bernard has served as deputy director of the National Institute on Aging since October 2008 and as acting COSWD since October 2020. She has had a leadership role in several NIH initiatives to enhance diversity, including the recently launched UNITE initiative, an effort to end structural racism in biomedical research.

[Director of NCATS Departs](#). After nearly a decade of leadership as the founding director of NCATS, Christopher P. Austin, MD, departed NIH to join a life sciences platforms company in Cambridge, Massachusetts, as CEO-partner. Austin led NCATS in developing new approaches that speed therapeutic development for all diseases. Following Austin's departure, NCATS deputy director Joni Rutter, PhD, stepped in as acting director while a nationwide search for a new director takes place.

NIDCR UPDATE

Institute News

[NIDCR to Release Report on Oral Health in America](#). As a 20-year follow-up to the seminal *Oral Health in America: A Report of the Surgeon General*, NIDCR will release *Oral Health in America: Advances and Challenges* in the fall of 2021. This exhaustively researched report will examine improvements in oral health over the past two decades, describe challenges and opportunities that affect oral health, and articulate a vision for the future, calling upon all Americans to take action. NIDCR issued a brief [Q&A](#) regarding details of the report's release.

[NIDCR at IADR/AADOCR/CADR General Session](#). NIDCR leadership, program staff, investigators, and trainees were among the presenters and honorees at the 2021 virtual meeting of the International Association for Dental Research (IADR); American Association for Dental, Oral, and Craniofacial Research (AADOCR); and Canadian Association for Dental Research (a full list of NIDCR-related events can be found at [NIDCR-Sponsored Events at the 2021 IADR/AADR/CADR General Session](#)):

- In a virtual interaction session with more than 100 participants, NIDCR Director Dr. D’Souza provided an overview of NIDCR’s current programs and activities. She described her vision for achieving the institute’s mission to advance fundamental knowledge about dental, oral, and craniofacial health and disease and translate these findings into prevention, early detection, and treatment strategies that improve overall health for all individuals and communities across the lifespan. Recordings of this session and other NIDCR-related events can be viewed by registered meeting attendees on the IADR virtual platform.
- Lois Cohen, PhD, received the [2021 IADR Distinguished Scientist Award in Global Oral Health Research](#) for her contributions to the field of social and behavioral research in dentistry.
- Rei Sekiguchi, DDS, PhD, and Ken Yamada, PhD, received [The Journal of Dental Research Cover of the Year Award, 2020](#) in recognition of their paper, “Single-Cell RNA-seq Identifies Cell Diversity in Embryonic Salivary Glands.”
- Former NIDCR director and current investigator at the National Institute of Arthritis and Musculoskeletal and Skin Diseases, Martha Somerman, DDS, PhD, received the [AADR Jack Hein Public Service Award](#), which honors service in promoting oral health research interests and activities to the public.
- Clinical research fellow Joshua Emrick, DDS, PhD, won first place among more than 20 contestants in the [AADR Hatton Competition](#) for his presentation at the meeting.
- Predoctoral fellow Jeremie Oliver, MS, received the [Craniofacial Biology Group Award \(Junior Category\)](#) for his presentation; Oliver works in the lab of Dr. D’Souza.

[Upcoming Workshop: Immune System’s Role in Tissue Regeneration.](#) The National Academies of Sciences, Engineering, and Medicine (NAEM) will host a two-day virtual workshop titled “Understanding the Role of the Immune System in Improving Tissue Regeneration” on November 2-3, 2021. Co-organized by NIDCR, the free workshop will explore promising approaches to improve clinical outcomes of tissue repair and regeneration in patients. This workshop is part of [NAEM’s Forum on Regenerative Medicine](#). Register [here](#).

[NIH & NIDCR Prioritize HIV-Related Stigma Research.](#) Staff from NIDCR and 13 other NIH institutes and offices contributed to a paper in the journal *AIDS and Behavior* outlining NIH’s HIV-related stigma research priorities. NIDCR is dedicated to supporting research on strategies to ensure people living with HIV/AIDS may seek dental care without concerns about stigma or discrimination, echoing an NIH-wide effort.

NIDCR-Supported Science Advances

[Portable Coronavirus Sensor Provides Results Within Seconds.](#) In a preliminary study funded by NIDCR, researchers developed a hand-held device that rapidly and reliably detects SARS-CoV-2 in artificial saliva. The portable sensor could eventually be used for low-cost COVID-19 testing in a variety of locations, including dental and health care settings, schools, the travel industry, and at home.

[Dialing Down Pain from the Brain.](#) NIDCR Stadtman investigator Yuanyuan “Kevin” Liu, PhD, is decoding brain-spinal cord conversation to understand how the brain perceives touch and pain. His research revealed a brain area in mice that acts as a volume control for mechanical allodynia, a neuropathic pain condition where light touch is perceived as painful. The findings could have broader implications for other pain disorders and reveal potential treatment targets.

[Mimicking Mother Nature to Grow an Artificial Gland](#). A video on NIDCR’s website shows a salivary gland growing into a mature organ and features NIDCR scientists as they describe how they achieved the first key step in creating an artificial salivary gland. The researchers are exploring ways to restore or replace damaged salivary glands to help patients who have lost salivary function from certain conditions, such as Sjögren's disease or radiation therapy for head and neck cancer.

[A Four-Decade Quest to Uncover a Unique Molecule’s Secret](#). Biochemist Myung Hee Park, PhD, reflects on her 42-year career at NIDCR, where she pioneered research on a new molecular pathway vital for nearly all life. Her work opened a new field of research that could shed light on new approaches to treat certain cancers and neurodevelopmental disorders. Park retired on June 30 and will continue to serve as a special volunteer at the NIH, providing her expertise to collaborators.

[A Census Inside Your Mouth](#). NIDCR scientists catalogued 120,000 oral mucosa cells by type and function, revealing a role for connective tissue cells in orchestrating immune responses linked to gum disease. The cell atlas is designed to serve as a detailed community resource to help researchers answer key questions about oral biology and disease.

[When a New Immune System Attacks](#). NIDCR Lasker Clinical Research Scholar Jacqueline Mays, DDS, MHSc, PhD, is unravelling why bone marrow or blood stem cell transplant patients’ new immune systems sometimes attack the mouth, a condition called chronic oral graft-versus-host disease. Patients with the condition often have oral ulcers, difficulty opening their mouths, and salivary gland damage that makes eating and oral care difficult. Her findings may help scientists find better treatments and diagnostic tools and even offer insights to how the body responds to coronavirus infection.

[The Creatures Crawling Within](#). NIDCR scientists captured video of a human fibroblast cell creeping and crawling through a web of proteins, demonstrating a “front wheel drive” mechanism to migrate through the body—a method distinct from cancer cells. The findings, published in *Developmental Cell*, could shed light on ways to thwart the invasion and spread of cancers, including those of the head and neck.

[Brain Patrol](#). NIDCR researcher Eva Mezey, MD, PhD, DSc, and colleagues demonstrated the presence of lymphatic vessel cells and immune cells throughout the brains of humans, suggesting our immune systems may be policing our brains. Their findings point to the existence of a lymphatic network that acts as a waste drainage system for the brain and may serve as a bidirectional conduit between the brain and immune system.

[How to Heal Skin Without the Scars](#). Scientists, supported by NIDCR and the National Institute of General Medical Sciences, discovered how to reprogram certain mouse skin cells with a topical treatment to make them respond to injuries more like fetal skin cells, which patch up wounds without leaving a mark. The findings suggest it may one day be possible to allow wounds to heal without compromising the integrity of the skin. The findings also may have implications for other medical afflictions that involve scarring, such as liver and lung fibrosis, burns, scleroderma, and scarring of heart tissue after a heart attack.

Personnel Update

Akintunde Emiola, PhD, joins NIDCR as an Earl Stadtman Investigator and chief of the Microbial Therapeutics Unit in the Division of Intramural Research. Dr. Emiola received a master’s in bioinformatics and a PhD in systems biology from the University of East London, UK, in 2016. He

completed his postdoctoral research at the Jackson Laboratory for Genomic Medicine, where he was a Maximilian & Marion Hoffman Foundation Fellow. His research uses bioinformatic, genomic, and molecular biology tools to investigate the microbiome in order to discover new therapeutic agents and identify microbial signatures for early detection of diseases.

Myung Hee Park, PhD, retired as chief of the Molecular and Cellular Biochemistry Section in the Division of Intramural Research on June 30, 2021. Dr. Park first joined NIDCR in 1979 as a visiting fellow and was appointed chief of NIDCR's Molecular and Cellular Biochemistry Section in 1998. Her research focused on the cellular role of polyamines and the effects of polyamine modification on eukaryotic translation factor 5A (eIF5A), which is essential for development. She helped discover that people with impaired eIF5A exhibit developmental delays, intellectual disabilities, seizures, and abnormalities in facial features. Dr. Park was an active member of the Korean scientist community at NIH and served as president of the NIH Korean Scientists Association and as president of the NIH chapter of the Korean Women in Science and Engineering group.