



Meeting of the
President's Council of Advisors on Science and Technology (PCAST)
November 29, 2021

Invited Speaker Biographies

(in order of presentation)

MICHAEL CHUI, PHD

Michael Chui is a partner at the McKinsey Global Institute, McKinsey's business and economics research arm. He leads research on the impact of disruptive technologies and innovation on business, the economy, and society. Chui has led McKinsey research in such areas as data and analytics, social and collaboration technologies, the Internet of Things, artificial intelligence, robotics and automation, and biological technologies. He is a global co-sponsor of the Asians at McKinsey affinity network and serves on the internal advisory council for the McKinsey Institute for Black Economic Mobility. As a McKinsey consultant, Chui served clients in the high-tech, media, and telecom industries on strategy, innovation and product development, IT, sales and marketing, M&A, and organization. He is also on the boards of the James Irvine Foundation and the Asia Society of Northern California, and a member of the Council on Foreign Relations. Prior to joining McKinsey, Chui served as the first Chief Information Officer of the city of Bloomington, Indiana, where he re-architected the enterprise architecture using open source technologies and led a project that resulted in Bloomington becoming the first community in the world to offer both live and archived video streaming of public meetings on the Web. He was founder and executive director of HoosierNet, Inc., a nonprofit cooperative Internet service provider that provided Internet access to consumers, nonprofits, governments, and businesses.

MICHELLE McMURRY-HEATH, MD PHD

Michelle McMurry-Heath is the President and CEO of Biotechnology Innovation Organization (BIO). BIO represents 1,000 life sciences companies and organizations from 30 countries. The common thread in

McMurry-Heath's work has been broadening access to scientific progress so more patients from diverse backgrounds can benefit from cutting-edge innovation. Previously, she was at Johnson & Johnson (J&J) where she served as Global Head of Evidence Generation for Medical Device Companies and then Vice President of Global External Innovation and Global Leader for Regulatory Sciences. She was also instrumental in bringing J&J's incubator, J Labs, to Washington, DC. She led a global team of 900 with responsibilities in 150 countries. Prior to her time at J&J, McMurry-Heath was a key science policy leader in government. She served in the Obama-Biden transition team to conduct a comprehensive analysis of the National Science Foundation's (NSF's) policies, programs and personnel. President Obama then named her associate science director of the Food and Drug Administration's Center for Devices and Radiological Health under Commissioner Peggy Hamburg. In that role, she championed clinical trial evolution, the use of real-world evidence in product evaluation, and an embrace of the patient's voice in health research so new medical products deliver outcomes that matter to them. McMurry-Heath was the founding director of the Aspen Institute's Health, Biomedical Science, and Society Policy Program, where she promoted personalized medicine and bolstered international preparation for pandemic disease threats. She worked at the Robert Wood Johnson Foundation and later served as Senator Joe Lieberman's top legislative aide for science and health. In that role, she drafted legislation to protect the country from biological attacks. McMurry-Heath spent 12 years working at the research bench before taking policy and leadership roles in government and industry.

GINTARAS REKLAITIS, PHD

Gintaras Reklaitis is the Burton and Kathryn Gedge Distinguished Professor of Chemical Engineering at Purdue University. He has served as Head of the School of Chemical Engineering and Deputy Director of the NSF Engineering Research Center on Structured Organic Particulate Systems, among other appointments. His expertise lies in process systems engineering, the application of information and computing technologies to process and product design, process operations and supply chain management. Current research interests include applications of process systems methodology to improve pharmaceutical product design, development, manufacture and administration as well as systems studies of integrated energy networks and supply chains. He is a member of the National Academy of Engineering, fellow of AIChE, and past Editor-in-Chief of Computers & Chemical Engineering. Among the recognitions he has received are the CAST Computing in Chemical Engineering Award (AIChE), the ChE Lectureship Award (ASEE), the George Lappin (AIChE) and Van Antwerpen Awards (AIChE), the Pruitt Award (CCR) and the Long-Term Achievements in Computer Aided Process Engineering Award of the EFChE. He has served on the Board of Directors of AIChE, the Council for Chemical Research and the CACHE Corporation and continues to serve on the editorial boards of several journals. He has published 270 papers and book chapters and edited/authored nine books. Reklaitis served as the Chair of the 2021 National Academies of Sciences, Engineering, and Medicine (NASEM) report titled "Innovations in Pharmaceutical Manufacturing on the Horizon."

RICHARD M. MURRAY, PHD

Richard M. Murray is the Thomas E. and Doris Everhart Professor of Control & Dynamical Systems and Bioengineering at the California Institute of Technology (Caltech), where he has been on the faculty since 1991. Murray served as the Division Chair (Dean) of Engineering and Applied Science from 2000-2005, the Director for Information Science and Technology from 2005-2008, and is currently the Division

Chair for Biology and Biological Engineering (2020-). Murray served on the Air Force Scientific Advisory Board from 2002-2006, the Defense Innovation Board from 2016-2021, and has served on advisory committees for the Jet Propulsion Laboratory (JPL), the Pacific Northwest National Laboratory (PNNL), and the Defense Advanced Research Projects Agency (DARPA). Murray is an elected member of the National Academy of Engineering (2013) and the recipient of the 2017 IEEE Control Systems Award. Murray's research is in the application of feedback and control to networked systems, with applications in autonomy and biology. Murray's work in biological engineering includes design of biomolecular feedback circuits in microbes and cell-free methods for use in rapid prototyping and synthetic cells. He was the Chair of the 2017 NASEM report "Preparing for Future Products of Biotechnology."

RESHMA SHETTY, PHD

Reshma Shetty is a co-founder of Ginkgo Bioworks, which recently listed on the New York Stock Exchange under the ticker symbol \$DNA. Ginkgo's mission is to make biology easier to engineer. Under Shetty's leadership, Ginkgo has grown into the premiere platform company for engineering biology and is playing a crucial role in the global response to COVID-19. Shetty has been active in the field of synthetic biology for nearly 20 years, co-organizing the first international conference in the field in 2004. In 2008, Forbes magazine named Shetty one of Eight People Inventing the Future, and in 2011, Fast Company named her one of 100 Most Creative People in Business. In 2014, Ginkgo became the first biotech company to participate in YCombinator. In 2018, Business Insider named her one of the most powerful female engineers. In 2019, BIO recognized Shetty with the Rosalind Franklin Award for Leadership in Industrial Biotechnology and Agriculture.

JAY KEASLING, PHD

Jay Keasling is the Hubbard Howe Jr. Distinguished Professor of Biochemical Engineering at the University of California, Berkeley in the Departments of Bioengineering and Chemical and Biomolecular Engineering, senior faculty scientist at Lawrence Berkeley National Laboratory, and Chief Executive Officer of the Joint BioEnergy Institute (JBEI). Keasling's research focuses on the metabolic engineering of microorganisms for degradation of environmental contaminants or for environmentally friendly synthesis of drugs, chemicals, and fuels. Keasling has received numerous honors for his work over the years, including the Heinz Award for Technology, the Economy and Employment (2012), the George Washington Carver Award (2013), and the ENI Renewable Energy Prize (2014). Keasling was also elected a Fellow of the National Academy of Inventors in 2014. He is a member of the National Academy of Engineering and the National Academy of Inventors.

DOUG FRIEDMAN, PHD

Doug Friedman is CEO of BioMADE, the Bioindustrial Manufacturing Innovation Institute. He is also President of the Engineering Biology Research Consortium (EBRC), a nonprofit membership organization focused on advancing precompetitive technologies in a safe, secure, sustainable, and ethical manor. He was the inaugural Executive Director of EBRC from 2016 to 2021. His primary scientific and technical interests lie in the fields of synthetic biology, biomanufacturing, and modern biotechnology. Friedman's

policy interests include development of sustainable biotechnology, safeguarding the bioeconomy, and accelerating technical advancement by building diverse, robust community partnerships. He regularly serves as a subject matter expert on emerging biotechnologies, biotechnology policy, and national security topics at the interface of the biological and chemical sciences. Friedman participates in more than a dozen external scientific and policy committees and boards. Prior to his role at EBRC, Friedman was a study director and senior program officer with the Board on Chemical Sciences and Technology at the National Academies of Sciences, Engineering, and Medicine. His primary portfolio focused on the advancement of science and engineering at the interface of chemistry and biology, often as they related to national security.

CANDICE WRIGHT, MPP

Candice Wright is a Director in the Government Accountability Office's (GAO's) Science, Technology Assessment, and Analytics team. She oversees GAO's work on federally-funded research, intellectual property protection and management, and federal efforts to help commercialize innovative technologies and enhance U.S. economic competitiveness. Wright joined GAO in 2004. She has led engagements examining federal contracting, risks to the defense supplier base, foreign military sales, and homeland security. In 2011, she served on a congressional detail to the Senate Permanent Subcommittee on Investigations. Wright also served as the head of GAO's office in Kabul, Afghanistan.

MARIE BERNARD, MD

Marie Bernard is the National Institute of Health's (NIH's) Chief Officer for Scientific Workforce Diversity. She leads NIH's effort to promote diversity, inclusiveness, and equity throughout the biomedical research enterprise. Bernard has also served as the Deputy Director of the National Institute on Aging (NIA) since October 2008 where she served as senior geriatrician and principal advisor to the NIA director. She directed and supervised the NIA Office of Special Populations, which leads health disparities research and training for scientists from diverse backgrounds within NIA. Bernard is a founding member of the Diversity Working Group and NIH Equity Committee, and co-chair of the NIH Inclusion Governance Committee, which oversees inclusion in clinical research by sex/gender, race/ethnicity, and age. Bernard also leads the Women of Color Committee of the Working Group on Women in Biomedical Careers, which established the Women of Color Research Network. Bernard has been recognized for her leadership with multiple awards, including the 2020 NIH Director's Award for Equity, Diversity, and Inclusion. Her research is focused on nutrition and function in older populations, specifically underrepresented minority populations. She has published and lectured extensively in this area, as well as served on national committees, including as chair of the Clinical Medicine Section of the Gerontological Society of America, chair of the Department of Veterans Affairs National Research Advisory Committee, board member of the American Geriatrics Society, president of the Academy for Gerontology in Higher Education, and president of the Association of Directors of Geriatric Academic Programs. Prior to joining NIH, she was the endowed professor and founding chair of the Donald W. Reynolds Department of Geriatric Medicine at the University of Oklahoma College of Medicine, and Associate Chief of Staff for Geriatrics and Extended Care at the Oklahoma City Veterans Affairs Medical Center.

BRUCE RODAN, MD

Bruce Rodan is the Associate Director for Science for the Environmental Protection Agency's (EPA's) Office of Research and Development (ORD). Rodan is a physician with Masters Degrees in Environmental Studies and Public Health. His role in the ORD Immediate Office of the Assistant Administrator is to advance the broad spectrum of human health and ecological research activities conducted at this premier environmental research organization. Prior to his return to ORD, Rodan was the Assistant Director for Environmental Health at the White House Office of Science and Technology Policy (OSTP), serving eight years under both the Obama and Bush Administrations. While at OSTP, Rodan led and engaged in a variety of White House and interagency priority actions, including advancing chemical toxicity research and occupational and environmental health, coordinating the President's initiative to improve pollinator health, developing open innovation challenges to address intractable problems, and responding to public health threats such as Ebola and Zika, and the impacts of climate change. His previous roles with ORD have been as Assistant Center Director in ORD's previous National Center for Environmental Assessment and Senior Scientist in the Office of Science Policy. He came to the EPA as a Fellow with the American Association for the Advancement of Science, following seven years as a consultant in Washington DC and five years in clinical medical practice.

LISA E. FRIEDERSDORF, PHD

Lisa E. Friedersdorf is the Director of the National Nanotechnology Coordination Office (NNCO) and Assistant Director for Microelectronics, Materials, and Nanotechnology at the White House Office of Science and Technology Policy. She has been involved in nanotechnology for over twenty-five years, with a particular interest in advancing technology commercialization through university-industry-government collaboration. She is a strong advocate for science, technology, engineering, and mathematics (STEM) education, and has over two decades of experience teaching at both the university and high school levels. Prior to joining the NNCO, Friedersdorf held a number of positions at the intersection of academia, industry, and government. At Lehigh University, she served as the associate director of the Materials Research Center and director of the industry liaison program. In this role, she oversaw dozens of membership programs and was responsible for developing and coordinating multi-investigator interdisciplinary research programs including a multimillion-dollar public-private partnership in microelectronics. As director of the Virginia Nanotechnology Initiative, she led an alliance of academic institutions, industry, and government laboratories with an interest in nanotechnology across the Commonwealth of Virginia. At the University of Virginia, she served as managing director of the nanoSTAR Institute and led the development of pan-university initiatives as a program manager in the Office of the Vice President for Research. Additionally, Friedersdorf has been active in the start-up ecosystem for many years assisting small companies with business development and access to resources, and vetting emerging technologies for investors.