

Cancer Engineering: The Convergence of Engineering and Health to Advance Cancer Research and Care

Convened by the National Cancer Policy Forum in collaboration with the Board on Mathematical Sciences and Analytics and the Board on Life Sciences



NATIONAL ACADEMIES Sciences
Engineering
Medicine

Cancer Engineering

**The Convergence of Engineering and Health
to Advance Cancer Research and Care**

Day 1 May 20 · 8:30AM – 4:30PM ET
Poster Session · 4:30PM – 5:30PM ET

Day 2 May 21 · 8:30AM – 11:30AM ET

National Academy of Sciences Building – Auditorium
2101 Constitution Ave, NW
Washington, DC 20418

Link to view the live webcast:

[Cancer Engineering: The Convergence of Engineering and Health to Advance Cancer Research and Care | National Academies](#)

Workshop Location and Floor Plan

The National Academy of Sciences Building
2101 Constitution Ave, N.W.
Washington, DC 20418



Ride share/taxi: The NAS building is across the street from The State Department (C Street entrance), or look for the Einstein statue (Constitution Avenue entrance)!

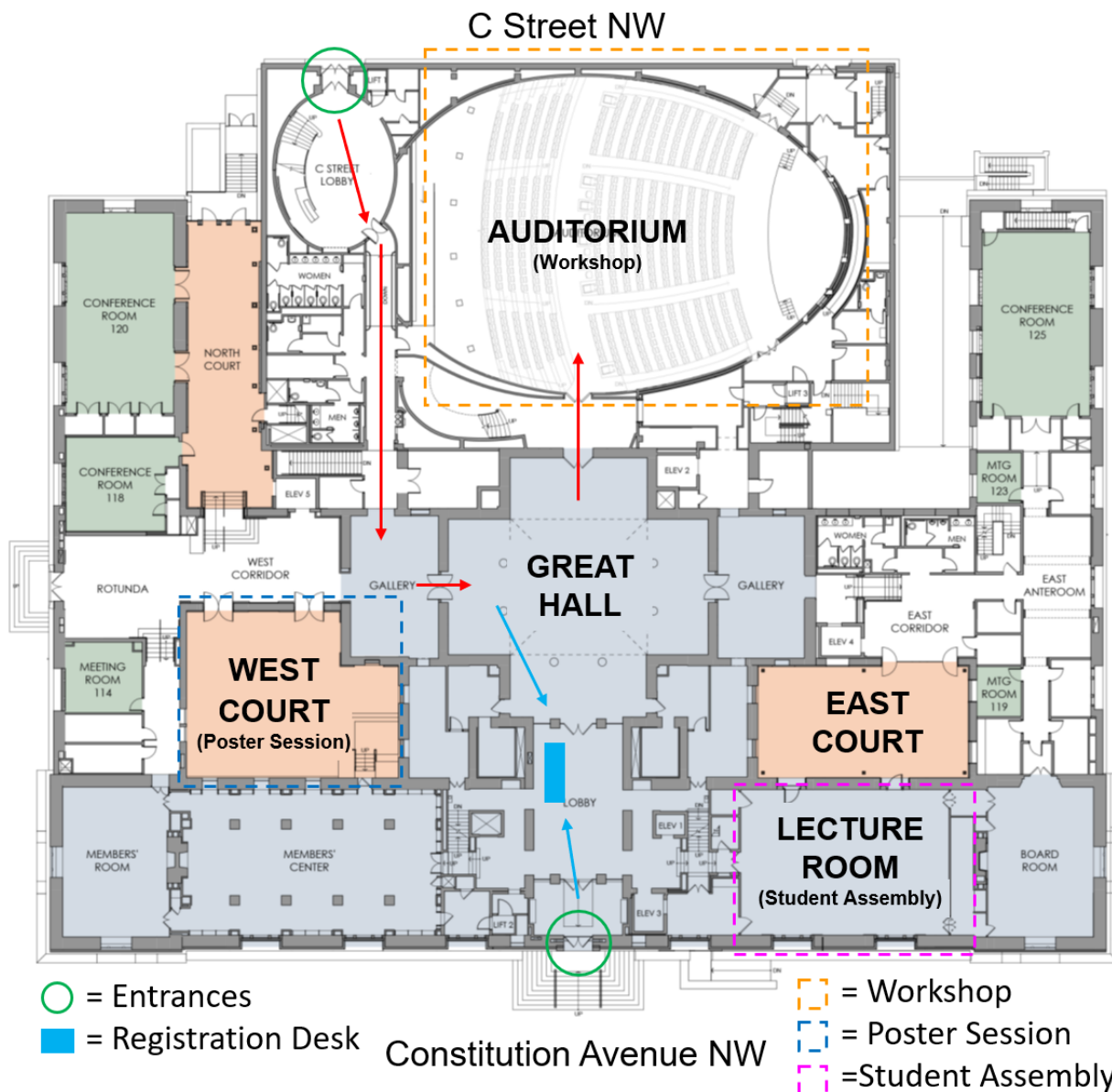
Entering from Constitution Avenue NW: Please present your identification to the security guard at the desk, proceed through the lobby to visit the registration desk to check in for the workshop before proceeding through the Great Hall into the Auditorium.

Entering from C Street NW: Please present your identification to the security guard at the desk, proceed through the lobby and hallway, and turn left into the Great Hall. Please veer right to visit the registration desk in the front lobby across the Great Hall to check in for the workshop. Return through the Great Hall into the Auditorium.

See the National Academy of Sciences Building floor plan below.

National Academy of Sciences Building Floor Plan

Workshop – Auditorium
Poster Session – West Court
Student Assembly – Lecture Room
Workshop Reception – Great Hall



May 20, 2025

Dear Colleagues,

Welcome to the National Academies of Sciences, Engineering, and Medicine workshop on *Cancer Engineering: The Convergence of Engineering and Health to Advance Cancer Research and Care*, convened by the National Cancer Policy Forum in collaboration with the Board on Mathematical Sciences and Analytics and the Board on Life Sciences.

This workshop will help catalyze new knowledge and innovations to improve patient outcomes through the convergence of engineering with oncology research, practice, and policy. Workshop presentations and discussions will focus on strategies to break down disciplinary silos and promote convergence in engineering and cancer research and care; consider technologies and interventions that apply engineering approaches to accelerate cancer research and to improve care and outcomes for patients with cancer; review examples of the challenges and opportunities to translate advances from engineering into technologies that enable precision cancer research and care; consider strategies to ensure that advances in cancer engineering are broadly disseminated; discuss approaches to facilitate broad access to the output of cancer engineering to promote the delivery of high-quality care; and highlight opportunities to develop and expand the cancer engineering workforce, including leadership development, interdisciplinary education and training, collaborative research approaches, and use of dissemination and implementation science strategies.

Please note that it is essential to the National Academies mission of providing evidence-based advice that participants in all our activities avoid political or partisan statements or commentary and maintain a culture of mutual respect. The statements and presentations during our activities are solely those of the individual participants and do not necessarily represent the views of other participants or the National Academies.

We welcome your involvement in the workshop. Please use the microphones in the room or the chat box on our [website](#) to ask questions. Also, please mention your name and affiliation and keep your questions or comments very brief. A proceedings of the workshop will be published by the National Academies Press, in accordance with institutional guidelines, and may incorporate your comments and ideas. Archived presentations and videos from the workshop will also be available on the website.

We look forward to your involvement in this workshop.

Sincerely,

Rohit Bhargava, PhD
Grainger Distinguished Chair in Engineering
& Professor
Department of Bioengineering
Phillip and Ann Sharp Director
Cancer Center at Illinois
University of Illinois Urbana-Champaign

Hedvig Hricak, MD, PhD
Carroll and Milton Petrie Chair
Department of Radiology
Gerstner Sloan-Kettering Graduate
School of Biomedical Sciences
Memorial Sloan Kettering Cancer Center

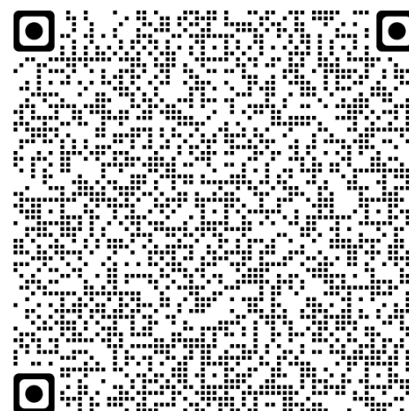
Roderic Pettigrew, PhD, MD
Vice Chancellor for Health and
Strategic Initiatives
The Texas A&M University System
Robert A Welch Professor
School of Engineering Medicine
Texas A&M University
Adjunct Professor of Nanomedicine
Houston Methodist

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May 20-21, 2025

National Cancer Policy Forum
Board on Mathematical Sciences and Analytics
Board on Life Sciences

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Washington DC 20418



[Workshop Website](#)

WORKSHOP AGENDA

TUESDAY, MAY 20, 2025 EASTERN TIME ZONE	
8:00 am	Breakfast and Registration (30 minutes)
8:30 am	Welcome and Introductory Remarks (~15 minutes) <i>Co-Chairs:</i> <i>Hedi Hricak, Memorial Sloan Kettering Cancer Center</i> <i>Roderic Pettigrew, The Texas A&M University System</i> <i>Rohit Bhargava, Cancer Center at Illinois, University of Illinois Urbana-Champaign</i> Academies Presidents Remarks (~30 minutes) - Marcia McNutt, President of the National Academy of Sciences and Chair of the National Research Council - Victor Dzau, President of the National Academy of Medicine (<i>video remarks</i>) - John Anderson, President of the National Academy of Engineering (<i>video remarks</i>)
9:15 am	Session 1: Overview of Cancer Engineering (~1 hour, 30 minutes) <i>Co-Moderators:</i> <i>Roderic Pettigrew, The Texas A&M University System</i> <i>Rohit Bhargava, Cancer Center at Illinois, University of Illinois Urbana-Champaign</i> <i>Session Objective:</i> Discuss the potential for convergence in engineering and cancer research and care. Session Keynote: The Power of Convergence in the Fight Against Cancer (~20 minutes) - Phillip Sharp, Massachusetts Institute of Technology Perspectives from the National Cancer Policy Forum (~10 minutes) - Robert Winn, Virginia Commonwealth University Perspectives from an Engineering Dean with an Allied Medical School (~10 minutes) - Rashid Bashir, University of Illinois Urbana-Champaign Transforming Cancer Research and Care through Convergence: Data Science, Artificial Intelligence and Virtual/Digital Platforms (~10 minutes) - Cheryl Willman, Mayo Clinic Federal Support to Advance this Emerging Field (~10 minutes) - Bruce Tromberg, National Institute of Biomedical Imaging and Bioengineering Discussion and Audience Q&A (~30 minutes)

10:45 am	Break (15 minutes)
11:00 am	Session 2: Engineering in Cancer Prevention and Diagnostics (~1 hour, 25 minutes) <i>Co-Moderators:</i> <i>Hedi Hricak, Memorial Sloan Kettering Cancer Center</i> <i>Bruce Tromberg, National Institute of Biomedical Imaging and Bioengineering</i> <i>Session Objective:</i> Examine the breadth of major areas in cancer engineering and discuss examples of how convergence of disciplines can lead to fundamental understanding and advances in improving patient outcomes. Session Keynote: Collaborative Team Science: Early Detection and Interception (~15 minutes) - Julian Adams, Stand Up To Cancer Lessons from Capture of Circulating Tumor Cells (~10 minutes) - Mehmet Toner, Massachusetts General Hospital mRNA Vaccines and Pancreatic Cancer (~10 minutes) - Vinod Balachandran, Memorial Sloan Kettering Cancer Center Opportunistic Artificial Intelligence for Predicting Cancer Outcomes (~10 minutes) - Anant Madabhushi, Emory University Systems Engineering to Improve Early Cancer Detection and Prevention in Low-Resource Settings (~10 minutes) - Rebecca Richards-Kortum, Rice University Discussion and Audience Q&A (~30 minutes) - Christina Chapman, Baylor College of Medicine
12:25 pm	Lunch (1 hour) <i>(Student Assembly and Photo Session)</i>
1:25 pm	Session 3: Engineering in Drug Development and Therapeutics (~1 hour, 30 minutes) <i>Co-Moderators:</i> <i>Bissan Al-Lazikani, The University of Texas MD Anderson Cancer Center</i> <i>Hadiyah-Nicole Green, Ora Lee Smith Cancer Research Foundation</i> <i>Session Objective:</i> Examine existing and emerging engineering approaches, from basic molecular biology to cellular therapy, that can enhance drug development and treatment of cancer. Session Keynote: Yesterday, Today, and Tomorrow (~20 minutes) - Robert Langer, Massachusetts Institute of Technology T-cell engineering CAR-T Therapy (~10 minutes) - Carl June, University of Pennsylvania Engineering Natural Killer (NK) Cell Engineering Against Cancer (~10 minutes) - Katy Rezvani, The University of Texas MD Anderson Cancer Center Engineering Molecular and Cellular Imaging and Image-Guided Therapy (~10 minutes) - Samuel Achilefu, University of Texas Southwestern Theranostics in Precision Oncology (~10 minutes) - Hossein Jadvar, University of Southern California Panel Discussion and Audience Q&A (~30 minutes)
2:55 pm	Break (15 minutes)

3:10 pm	Session 4: From Cancer Biology to Engineering Solutions (~1 hour, 20 minutes) <i>Co-Moderators:</i> <i>Phillip Sharp, Massachusetts Institute of Technology</i> <i>Christina Chapman, Baylor College of Medicine</i> <i>Session Objective:</i> Discuss cutting-edge technologies and developments to promote convergence in engineering and cancer research and care and facilitate access to the output of cancer engineering to promote the delivery of high-quality care. Highlight some of the scientific and grant opportunities. Biomaterials for Cancer Immunotherapy (~10 minutes) - David Mooney, Harvard University Personalized mRNA-based Cancer Vaccines (~10 minutes) - John Cooke, Houston Methodist Research Institute Hybrid Advanced Molecular Manufacturing Regulator for Cancer Immunotherapy (~10 minutes) - Omid Veisheh, Rice University Translational Opportunities in Cancer Mechanobiology (~10 minutes) - Cynthia Reinhart-King, Rice University Panel Discussion and Audience Q&A (~40 minutes)
4:30 pm	Poster Exhibition (1 hour)
5:30 pm	Workshop Reception (1 hour, 15 minutes)
6:45 pm	Adjourn

WEDNESDAY, MAY 21, 2025 EASTERN TIME ZONE	
8:00 am	Breakfast and Registration (30 minutes)
8:30 am	Day 2 Welcome (~5 minutes) <i>Hedi Hricak, Memorial Sloan Kettering Cancer Center</i>
8:35 am	Session 5: Celebrating Tomorrow: Oral Poster Presentations (~25 minutes) <i>Co-Moderators:</i> <i>Rohan Fernandes, The George Washington University</i> <i>Hadiyah-Nicole Green, Ora Lee Smith Cancer Research Foundation</i> Oral Poster Presentations (5 minutes each) - Haylie Helms, Oregon Health and Science University - Amrik Kang, University of California, San Francisco - Suyog Shaha, Harvard University - Shensheng Zhao, University of Illinois at Urbana-Champaign - Sampreeti Jena, University of Minnesota (<i>video remarks</i>)

9:00 am	Session 6: Cancer Engineering: Education (~1 hour, 15 minutes) <i>Co-Moderators:</i> Roderic Pettigrew, <i>The Texas A&M University System</i> Rohan Fernandes, <i>The George Washington University</i> <i>Session Objective:</i> Discuss opportunities to develop and expand the cancer engineering workforce, including leadership development, multidisciplinary education and training, collaborative research approaches, and use of dissemination and implementation science strategies. Learning at the Interfaces at the MIT Koch Institute (~10 minutes) - Paula Hammond, Massachusetts Institute of Technology Memorial Sloan Kettering Cancer Center Cancer Engineering Program (~10 minutes) - Kayvan Keshari, Memorial Sloan Kettering Cancer Center Bioengineering at Moffitt Cancer Center (~10 minutes) - Gregory Sawyer, Moffitt Cancer Center, University of Florida Translational Research Institute at Cedars-Sinai (~10 minutes) - Ze'ev Ronai, Cedars-Sinai Medical Center Panel Discussion and Audience Q&A (~35 minutes) Session speakers and: - Nastaran Zahir, Center for Cancer Training, National Cancer Institute, National Institutes of Health
10:15 am	Break (15 minutes)
10:30 am	Session 7: Summary Discussion with Co-Moderators: Advancing Cancer Engineering (~1 hour) <i>Co-Moderators:</i> Hedi Hricak, <i>Memorial Sloan Kettering Cancer Center</i> Roderic Pettigrew, <i>The Texas A&M University System</i> - Session 1: Roderic Pettigrew and Rohit Bhargava - Session 2: Hedi Hricak and Bruce Tromberg - Session 3: Bissan Al-Lazikani and Hadiyah-Nicole Green - Session 4: Phillip Sharp and Christina Chapman - Session 6: Roderic Pettigrew and Rohan Fernandes
11:30 am	Adjourn

You may also scan the QR code below to submit questions and comments.
Please state your name and affiliation prior to asking a question.



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We are grateful for the support of our sponsors, which is crucial to the work of the Forum.

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Planning Committee Roster

Rohit Bhargava, PhD (Co-Chair)

Grainger Distinguished Chair in Engineering
and Professor

Department of Bioengineering

Philip and Anna Sharp Director

Cancer Center at Illinois

University of Illinois Urbana-Champaign

**Hedvig Hricak, MD, PhD, Dr.h.c^m
(Co-Chair)**

Carroll and Milton Petrie Chair

Department of Radiology

Gerstner Sloan-Kettering Graduate School of
Biomedical Sciences

Memorial Sloan Kettering Cancer Center

Roderic Pettigrew, PhD, MD (Co-Chair)

Vice Chancellor for Health and
Strategic Initiatives

The Texas A&M University System

Robert A Welch Professor

School of Engineering Medicine

Texas A&M University

Adjunct Professor of Nanomedicine

Houston Methodist

Bissan Al-Lazikani, PhD, MBCS, FRSB

Full Professor

Genomic Medicine

Lead of AI-driven Drug Discovery and

Development and Virtual Patient Initiative

Director of Therapeutics Data Science

The University of Texas MD Anderson

Cancer Center

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Program Co-Lead

Clinical and Translational Oncology Program

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The George Washington University

Hadiyah-Nicole Green, PhD

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Atlanta VA Medical Center

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Department of Surgery

Morehouse School of Medicine

Phillip Sharp, PhD

Institute Professor Emeritus

Department of Biology

Koch Institute for Integrative Cancer Research

Massachusetts Institute of Technology

Bruce J. Tromberg, PhD

Director

National Institute of Biomedical Imaging

and Bioengineering

National Institutes of Health

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Speaker, Panelist, and Moderator Roster

Marcia McNutt, PhD

President
National Academy of Sciences
Chair
National Research Council

Victor J. Dzau, MD

President
National Academy of Medicine
Vice Chair
National Research Council

John L. Anderson, PhD

President
National Academy of Engineering

Rohit Bhargava, PhD

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Director of Therapeutics Data Science
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The George Washington University

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Associate Member
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Human Oncology & Pathogenesis Program
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Founding Director
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Professor and Chair
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Vice Provost for Faculty
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Director of the Parker Institute for
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CPRIT Scholar in Cancer Research
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Mayo Clinic Cancer Programs
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David A. Ahlquist Professorship in Cancer Research
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School of Medicine
President
Association of American Cancer Institutes

Nastaran Zahir, PhD

Deputy Director
Center for Cancer Training
Branch Director of Cancer Training
National Cancer Institute
National Institutes of Health

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Speaker, Panelist, Moderator, and Planning Committee Biosketches



Marcia McNutt, PhD

National Academy of Sciences; National Research Council

Marcia McNutt is a geophysicist and president of the National Academy of Sciences. From 2013 to 2016, she served as editor-in-chief of the Science journals. Prior to joining Science, she was director of the U.S. Geological Survey (USGS) from 2009 to 2013. During her tenure, the USGS responded to a number of major disasters, including earthquakes in Haiti, Chile, and Japan, and the Deepwater Horizon oil spill. McNutt led a team of government scientists and engineers at BP headquarters in Houston who helped contain the oil and cap the well. She directed the flow rate technical group that estimated the rate of oil discharge during the spill's active phase. For her contributions, she was awarded the U.S. Coast Guard's Meritorious Service Medal.

Before joining the USGS, McNutt served as president and chief executive officer of the Monterey Bay Aquarium Research Institute (MBARI), in Moss Landing, California. During her time at MBARI, the institution became a leader in developing biological and chemical sensors for remote ocean deployment, installed the first deep-sea cabled observatory in U.S. waters, and advanced the integration of artificial intelligence into autonomous underwater vehicles for complex undersea missions.

From 2000 to 2002, McNutt served as president of the American Geophysical Union (AGU). She was chair of the Board of Governors for Joint Oceanographic Institutions, responsible for operating the International Ocean Drilling Program's vessel JOIDES Resolution and associated research programs.

McNutt began her academic career at the Massachusetts Institute of Technology (MIT), where she was the E.A. Griswold Professor of Geophysics and directed the Joint Program in Oceanography/Applied Ocean Science & Engineering, jointly offered by MIT and the Woods Hole Oceanographic Institution. Her research area is the dynamics of the upper mantle and lithosphere on geologic time scales, work that has taken her to distant continents and oceans for field observations. She is a veteran of more than a dozen deep-sea expeditions, on most of which she was chief or co-chief scientist.

McNutt received a B.A. in physics from Colorado College and her Ph.D. in Earth sciences at the Scripps Institution of Oceanography. She holds honorary doctoral degrees from the Colorado College, the University of Minnesota, Monmouth University, the Colorado School of Mines, University of Miami, Uppsala University, Michigan State University, Worcester Polytechnic Institute, George Washington University, Boston University, Texas A&M University, Indiana University Bloomington, and the National Academy of Sciences of Ukraine. McNutt is a member of the National Academy of Engineering, the American Philosophical Society and the American Academy of Arts and Sciences, a Foreign Member of the Royal Society, UK, the Russian Academy of Sciences, and the Chinese Academy of Sciences, and a Foreign Fellow of the Indian National Science Academy. She is a fellow of AGU, the Geological Society of America, the American Association for the Advancement of Science, and the International Association of Geodesy. In 1988, she was awarded AGU's Macelwane Medal for research accomplishments by a young scientist, and she received the Maurice Ewing Medal in 2007 for her contributions to deep-sea exploration.



Victor J. Dzau, MD
National Academy of Medicine

Victor J. Dzau, MD, is the President of the National Academy of Medicine (NAM), formerly the Institute of Medicine (IOM). In addition, he serves as Vice Chair of the National Research Council. Dr. Dzau is Chancellor Emeritus and James B. Duke Distinguished Professor of Medicine at Duke University and the past President and CEO of the Duke University Health System. Previously, Dr. Dzau was the Hersey Professor of Theory and Practice of Medicine and Chairman of Medicine at Harvard Medical School's Brigham and Women's Hospital, as well as Bloomfield Professor and Chairman of the Department of Medicine at Stanford University.

Dr. Dzau is an internationally acclaimed physician scientist and leader whose work has improved health and medicine in the United States and globally. His seminal work in cardiovascular medicine and genetics laid the foundation for the development of the class of lifesaving drugs known as ACE inhibitors, used globally to treat hypertension and heart failure. Dr. Dzau pioneered gene therapy for vascular disease and was the first to

introduce DNA decoy molecules in humans in vivo. His pioneering research in cardiac regeneration led to the Paracrine Hypothesis of stem cell action and his recent strategy of direct cardiac reprogramming using microRNA. He maintains an active NIH-funded research laboratory. Dr. Dzau is a leader in health and health policy.

At the NAM, he has led important initiatives such as Vital Directions for Health and Health Care, the Action Collaborative on Countering the US Opioid Epidemic, and the Action Collaborative on Clinician Well-Being and Resilience. Under his tenure, the NAM has advanced efforts to improve health equity and address racism throughout its programmatic activities, especially the Culture of Health Program. Most recently, the NAM launched a Grand Challenge in Climate Change and Human Health & Equity to reverse the negative effects of climate change on health and social equity by activating the entire biomedical community, communicating and educating the public about climate change and health, driving changes through research, innovation and policy, and leading bold action to decarbonize the health care sector.

As a global health leader, he helped design and launch the National Academies initiatives on Global Health Risk Framework; Global Health and Future Role of the US; Crossing the Global Quality Chasm and Human Genome Editing. The NAM Global Grand Challenge for Healthy Longevity represents his vision to inspire across disciplines and sectors to coalesce around a shared priority and audacious goal to advance health. He has led the NAM's response to COVID-19, which includes numerous committees, reports, consultations and communication on a range of issues including public health, vaccine allocation, health equity and mental health. He has worked tirelessly to engage with the global response to COVID-19 by providing leadership as a member of the Global Preparedness Monitoring Board, co-chair of the G20 Scientific Expert Panel on Global Health Security, Advisor to the G20 High Level Independent Panel on Financing and a principal of the ACT-Accelerator which includes COVAX, the global collaboration for accelerating the development, manufacture and equitable distribution of COVID-19 vaccines.

He is active in advising science and health in US and globally. He has served as a member of the Advisory Committee to the Director of the National Institutes of Health (NIH), chaired the NIH Cardiovascular Disease Advisory Committee and NHLBI Cardiovascular Progenitor Cell Biology Consortium. Currently, he chairs the Cardiovascular Progenitor Cell Translational Consortium. He is a member of the Health and Biomedical Sciences International Advisory Council of Singapore, as well as a board member of the Imperial College Health Partners, UK and the Gairdner Foundation. He chairs the International Scientific Advisory Committee of the Qatar Precision Medicine Institute, the Scientific Boards of the Peter Munk Cardiac Center, University of Toronto and Institute of Cardiovascular and Medical Sciences, University of Glasgow. He served on the Board of Health Governors of the World Economic Forum and chairs its Global Futures Council on Healthy Longevity.

Among his many honors and recognitions are the Max Delbreck Medal from Charite, Humboldt and Max Planck, Germany, the Distinguished Scientist Award from the American Heart Association, Ellis Island Medal of Honor, and the Henry Freisen International Prize. In 2019, he was named an Honorary Citizen of Singapore- the highest level of honor bestowed to a foreign citizen conferred by the President of Singapore. He has been elected to the National Academy of Medicine, the American Academy of Arts and Sciences, the European Academy of Sciences and Arts, UK Academy of Medical Sciences, the Japan Academy, Mexican Academy of Medicine, Chinese Academy of Engineering and Academia Sinica. He has received 16 honorary doctorates.

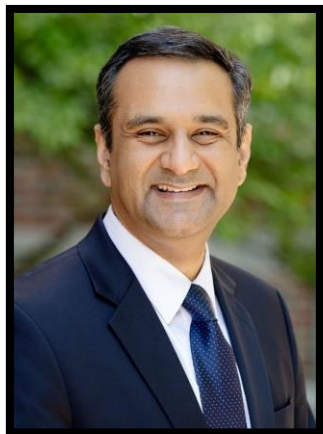


John L. Anderson, PhD
National Academy of Engineering

John L. Anderson began his six-year term as president of the National Academy of Engineering July 1, 2019. Previously, he was president of the Illinois Institute of Technology (IIT) and distinguished professor of chemical engineering (2007–15), and provost and executive vice president at Case Western Reserve University (CWRU) (2004–07). He worked at Carnegie Mellon University for 28 years, including 8 years as dean of the College of Engineering and 11 years as head of the chemical engineering department. He began his career as assistant professor of chemical engineering at Cornell University (1971–76).

Dr. Anderson was elected to the NAE in 1992 “for contributions to the understanding of colloidal hydrodynamics and membrane transport phenomena.” He was elected an NAE councillor in 2015. His extensive service to the NAE includes serving as chair of the Membership Policy Committee, Nominating Committee, Chemical Engineering Section, and Chemical Engineering Peer Committee. For the National Academies he has chaired the Committee on Determining Basic Research Needs to Interrupt the Improvised Explosive Device Delivery Chain, and the Committee on Review of Existing and Potential Standoff Explosives Detection Techniques.

Dr. Anderson is a fellow of the American Academy of Arts and Sciences and American Association for the Advancement of Science, and was appointed to the National Science Board (2014–20). He received the Acrivos Professional Progress Award from the American Institute of Chemical Engineers and the National Engineering Award from the American Association of Engineering Societies. He earned a BS from the University of Delaware (1967) and PhD from the University of Illinois at Urbana-Champaign (1971), both in chemical engineering. He holds honorary doctorates from IIT, Case Western Reserve University, Rensselaer Polytechnic Institute, and the University of Delaware.



Rohit Bhargava, PhD
Cancer Center at Illinois

Rohit Bhargava serves as the Director of the Cancer Center at Illinois (CCIL), as Grainger Distinguished Chair in Engineering and Professor of Bioengineering at the University of Illinois Urbana-Champaign. Rohit has pioneered the development of infrared chemical imaging and its biomedical applications. Starting from fundamental contributions to optical theory, he has led the development of new instruments that can use the chemical composition of tissue and artificial intelligence techniques to provide new diagnostics across cancer pathology. Rohit was educated as a chemical engineer at the Indian Institute of Technology – New Delhi and obtained a doctoral degree from Case Western Reserve University. As a postdoctoral fellow at the National Institutes of Health, showed the use of chemical imaging techniques for cancer pathology. He was the first external hire in the new Bioengineering department at Illinois and has been there for his independent academic career. He founded and continues to serve as Director of the CCIL, the first such center at

the convergence of engineering and oncology.



Hedvig Hricak, MD, PhD, Drhc^m
Memorial Sloan Kettering Cancer Center

Hedvig Hricak, MD, PhD, Drhc^m, is a diagnostic radiologist and holds the Carroll and Milton Petrie Chair of Radiology at Memorial Sloan Kettering Cancer Center, New York, NY. She is also a member of the Molecular Pharmacology and Chemistry Program, Sloan Kettering Institute, Professor, Gerstner Sloan Kettering Graduate School of Biomedical Sciences, and Professor of Radiology, Weill Cornell College of Medicine, New York, NY. The hallmark of her research career has been the development, validation, and dissemination of new diagnostic imaging techniques, particularly for oncology; she is actively engaged in developing evidence-based imaging guidelines and introducing the concept of integrated diagnostics for oncology. She is also devoted to reducing global disparities in cancer care. For her research accomplishments and her efforts to promote national and international education and collaboration in oncologic imaging, she has won

numerous awards, including the David Rall Medal, for Distinguished Leadership, from the National Academy of Medicine; eight gold medals; and honorary fellowships or memberships in twenty-two international radiological societies. She holds honorary doctorates from the Ludwig Maximilian University, Munich and the University of Toulouse III, Paul Sabatier, Toulouse, France. Hricak is a member of the National Academy of Medicine (formerly the Institute of Medicine) and a “foreign” member of both the Russian Academy of Sciences and the Croatian Academy of Sciences and Arts. She has served on several national advisory boards and councils, including the National Institutes of Health Board of Scientific Counselors, the Scientific Advisory Board of the National Cancer Institute, the Advisory Council of the National Institute of Biomedical Imaging and Bioengineering, and the Nuclear and Radiation Studies Board, National Academy of Sciences. She has also served as chair, co-chair, or member of several Institute of Medicine/National Academy of Medicine and National Academy of Sciences studies.



Roderic Pettigrew, PhD, MD
The Texas A&M University System

Roderic Ivan Pettigrew, PhD, MD, is the Robert A. Welch Professor of Medicine and CEO of Engineering Health (EnHealth) at Texas A&M University, where he also served as the inaugural Dean of the School of Engineering Medicine (ENMED). He is now Vice Chancellor for Health & Strategic Initiatives for the TAMU System. Dr. Pettigrew previously led the US National Institute of Biomedical Imaging and Bioengineering (NIBIB) as its founding Director, from 2002 to 2017, where he significantly advanced medical technologies and secured high returns on research investments. He was recruited to the NIH based on his prior career as a pioneer in cardiovascular 4D MRI having helped develop some of the earliest technologies. Dr. Pettigrew's current focus with EnHealth and ENMED integrates engineering into medical education to create innovative physician-engineers, or Physicianeers, who simultaneously earn MD and Master of Engineering Innovation in Medicine degrees in four years. Notably, ENMED students are also required to invent a solution to a healthcare challenge.

Dr. Pettigrew, an expert in health technologies and imaging, holds a PhD in Applied Radiation Physics from MIT and completed his medical training in Nuclear Medicine at UCSD. His work includes non-invasive cardiovascular imaging and research on coronary atheroma and strategies to expand diagnostic boundaries and prevention. He is an editor of the recent book *Biomechanics of Coronary Atherosclerotic Plaque: From Model to Patient*, the first comprehensive text on this topic. Elected memberships include the National Academy of Medicine, the National Academy of Engineering, the National Academy of Inventors, the American Academy of Arts and Sciences, and the National Academy of Sciences, India. Awards include the Pierre Galletti Award (highest honor) of the American Institute of Medical and Biological Engineering, the Inaugural Gold Medal of the Academy of Radiology Research, the Spirit of the Heart Award of the Association of Black Cardiologists, the Gold Medal of the Radiological Society of North America, the Arthur M. Bueche Award (a highest honor) of the National Academy of Engineering, the Vannevar Bush Award (highest honor) of the US National Science Board, the 2023 Boston Globe's STATUSList as one of the nation's Ultimate Leaders in Life Sciences, and the 2024 American Heart Association Research Achievement Award (highest honor).



Bissan Al-Lazikani, PhD, MBCS, FRSB

The University of Texas MD Anderson Cancer Center

Bissan Al-Lazikani is Director of Therapeutics Data Science, Professor of Genomic Medicine and Co-Lead of Computational Modelling for Precision Medicine at the Institute for Data Science in Oncology at MD Anderson Cancer Center. Before joining MD Anderson, she was Head of Data Science at the Institute of Cancer Research, London, UK. She is a data scientist and drug discoverer with a career spanning >20 years in applying data science and artificial intelligence to tackle key challenges in drug discovery. She is creator of a number of key international resources for drug discovery, including canSAR.ai, the world's largest, integrative knowledgebase for cancer drug discovery. She is recipient of a number of awards including being a CPRIT Scholar of Cancer Research, recipient of the AACR Team Science Award, and being elected Fellow of the Royal Society of Biology, and the International Society of Computational Biology. She obtained her BSc (Hons) in Molecular Biology from University College, London, an MSc in Computer Science from Imperial College London and a PhD from Cambridge University. She is a member of a number of professional societies

including AACR and ISCB (Fellow). She was a member of the NAS panel on Digital Twins in biomedical research.



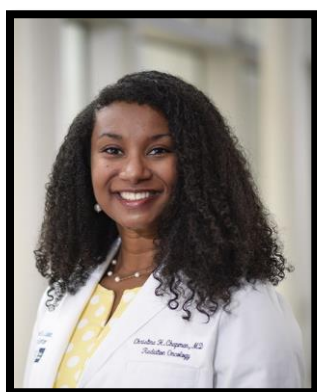
Justin E. Bekelman, MD

Daymark Health

Justin E. Bekelman, M.D., is cofounder and Chief Executive Officer of Daymark Health, a pioneering oncology value-based care company. Dr. Bekelman is an internationally recognized oncologist and innovator who has devoted his career to improving the health and lives of patients with cancer. Dr. Bekelman previously led the Penn Medicine's Center for Cancer Care Innovation at Abramson Cancer Center and is the Marietta and Howard Stoeckel Professor at the University of Pennsylvania School of Medicine. As one of the foremost leaders in cancer care delivery science, he has made seminal discoveries that have changed the practice of cancer care. Dr. Bekelman is an elected member of the American Society for Clinical Investigation and previously served as a member of the National Cancer Policy Forum of the National Academies of Science, Engineering, and Medicine. He has authored nearly 200 research articles and led large scale research programs funded by the US National Cancer Institute and the Patient Centered Outcomes Research Institute. He is a

board-certified radiation oncologist and practicing physician.

Dr. Bekelman's experience spans academia, industry, and government service. Previously, he was a strategy consultant at the Kalchas Group, a Bain McKinsey spinoff in London and New York. Dr. Bekelman served as Special Assistant to the Under Secretary of Defense in the US Department of Defense. Dr. Bekelman completed his undergraduate studies at Princeton University in the School of Public and International Affairs and his medical training at Yale University, Johns Hopkins, and Memorial Sloan Kettering Cancer Center.



Christina Chapman, MD
Baylor College of Medicine

Dr. Chapman obtained her BA in Biomedical Engineering from the Johns Hopkins University, her MD from the University of Pennsylvania Perelman School of Medicine, and her MS in Health and Healthcare Research from the University of Michigan, where she also completed her residency training in Radiation Oncology. She worked for 3.5 years at the VA Ann Arbor Healthcare System primarily treating patients with head and neck and lung cancers. She is currently an Assistant Professor of Radiation Oncology at Baylor College of Medicine, where she sees patients in the Harris Health County system, and is also an investigator at the Baylor/Houston VA Center for Innovations in Quality, Effectiveness, and Safety. She is a health equity researcher who focuses on diversity, equity, and inclusion in the physician workforce, the use of simulation modeling to investigate strategies to achieve cancer equity for Black women with breast cancer, and the use of other advanced health

services research methods to improve cancer equity for underserved and excluded populations.



Rohan Fernandes, PhD
The George Washington University

Rohan Fernandes, PhD is an Associate Professor of Medicine within the School of Medicine and Health Sciences at the George Washington University (GW) in Washington DC, USA. He is the Program Co-lead of the Clinical and Translational Oncology program at the GW Cancer Center and the Director of the GW Translational Research Lab for the inter-institutional Cell Enhancement and Technologies for Immunotherapy (CETI) Program. Dr. Fernandes is also Founder and CEO of ImmunoBlue, LLC, a startup company focused on translating nanoimmunotherapies for cancer developed in his academic lab. Dr. Fernandes completed a PhD in Bioengineering from the University of Maryland College Park and a postdoctoral fellowship from Johns Hopkins University. His research focuses on

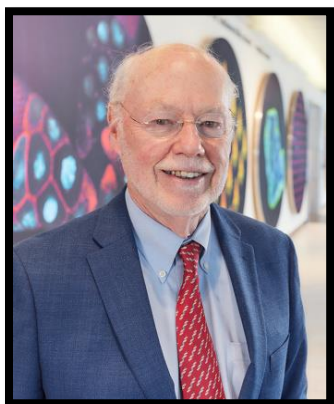
immunoengineering approaches to treat cancer, HIV, and other diseases. More specifically, his research group has developed engineered nanoparticles that can be used to elicit potent treatment responses from the immune system. Dr. Fernandes' research has been supported through multiple grants from the NIH (NCI and NIAID), DoD, and foundations such as the Alex's Lemonade Stand Foundation for Childhood Cancer. His research has been published in several prestigious peer-reviewed journals, including Nature Nanotechnology, Small, and Clinical Cancer Research. Dr. Fernandes has previously served as President of the Society for Thermal Medicine (2022-2023) and serves on the Editorial Board of Science Advances and The International Journal of Hyperthermia.



Hadiyah-Nicole Green, PhD
Ora Lee Smith Cancer Research Foundation

Dr. Hadiyah-Nicole Green is a STEM pioneer, leader, humanitarian, and entrepreneur who is ushering in the next generation of cancer treatments, cancer charities, and affordable healthcare. She is one of the nation's leading medical physicists and one of the first African American women to earn a Ph.D. in Physics, a U.S. Department of Veterans Affairs (VA) Career Development Award, and a VA Merit Scholar Award – all for her work developing targeted and localized cancer therapeutics. She is an associate professor at the Morehouse School of Medicine Department of Surgery. The FDA recently granted Breakthrough Device Designation for her localized cancer treatment that eliminates tumors in mice after one 10-minute treatment without observable side effects. To fundraise for human clinical trials and ensure affordability, Dr. Green founded a 501(c)(3) non-profit organization, Ora Lee Smith Cancer Research Foundation (OraLee.org). The media features of her story include ABC News, NBC News, The History Channel, PBS, and NPR. She has been distinguished as one

of the 100 Most Influential Americans by Ebony and The Root magazines, Top 30 Under 40 in Healthcare by Business Insider, 100 Women of the Century by USA Today, 50 Champions by Forbes, and a U.S. President's Lifetime Achievement Awardee.



Phillip Sharp, PhD
Massachusetts Institute of Technology

Phillip A. Sharp, an Institute Professor emeritus at MIT, is a member of the Department of Biology and the Koch Institute for Integrative Cancer Research. He joined the Center for Cancer Research in 1974, serving as director from 1985 to 1991 before becoming head of the Department of Biology for eight years.

He was founding director of the McGovern Institute from 2000 to 2004. Sharp has authored over 500 papers. He is an elected member of the National Academy of Sciences, the National Academy of Medicine, the American Academy of Arts and Sciences, the American Philosophical Society, and the Royal Society, UK. Among his many awards are the Gairdner Foundation International Award, the Lasker Basic Medical Research Award, and the National Medal of Science. His long list of service includes the presidency of the AAAS and Chair of the Scientific Advisory Committee, SU2C Project, AACR. A native of

Kentucky, Sharp earned a BA from Union College, Barbourville, KY, and a PhD in chemistry from the University of Illinois, Urbana-Champaign in 1969. His work studying the molecular biology of gene expression relevant to cancer and the mechanisms of RNA splicing earned Sharp the 1993 Nobel Prize in Physiology or Medicine.

Sharp is a member of the board of directors of the Broad Institute and the Gairdner Foundation (Canada), and chairs the advisory boards of Fidelity Biosciences Group, the MIT Museum, and the Jameel Clinic at MIT. Sharp is a co-founder of Biogen and of Alnylam Pharmaceuticals Inc. He is chairman of the scientific advisory board and member of the board of directors for Alnylam Pharmaceuticals; advisor and investor for Longwood and Polaris Venture Funds; and a member of the scientific advisory board for Danaher, Dewpoint Therapeutics, and Skyhawk Therapeutics.



Bruce J. Tromberg, PhD
National Institute of Biomedical Imaging and Bioengineering

Dr. Tromberg is the Director of the National Institute of Biomedical Imaging and Bioengineering (NIBIB) at NIH where he oversees research programs focused on developing, translating, and commercializing engineering, physical science, and computational technologies in biology and medicine. He leads NIBIB's Rapid Acceleration of Diagnostics technology (RADx Tech) initiative, established in 2020 to increase SARS-COV-2 testing capacity & performance and broadened in 2023 to include over the counter (OTC) and point of care (POC) devices for additional diseases and conditions. His laboratory, the Section on Biomedical Optics (SBO) in the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), develops portable, bedside, non-contact, and wearable technologies for quantitative sensing and imaging of tissue composition and metabolism.

Prior to joining NIH in January 2019, Dr. Tromberg was a professor of biomedical engineering and surgery at the University of California, Irvine (UCI). During his 30-year academic career Dr. Tromberg served in multiple leadership roles, including, director of UCI's Beckman Laser Institute and Medical Clinic (BLIMC), PI of the Laser Microbeam and Medical Program (LAMMP), an NIH National Biomedical Technology Center, and co-founder of UC Irvine's Department of Biomedical Engineering. Dr. Tromberg specializes in the development of optics and photonics technologies for biomedical imaging and therapy. He has co-authored more than 450 publications and holds 27 patents in new technology development as well as bench-to-bedside clinical translation, validation, and commercialization of devices. Honors and awards include the Michael S. Feld Biophotonics Award from Optica, the Britton Chance Biomedical Optics Award from the International Society of Optical Engineering (SPIE), and membership in the National Academies of Medicine and Engineering.

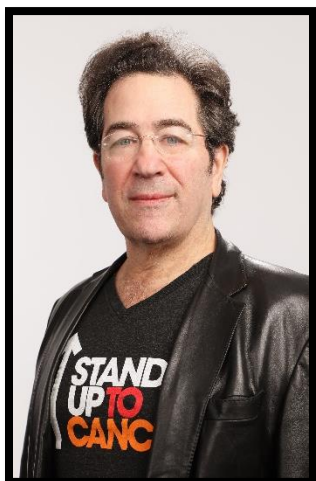


Samuel Achilefu, PhD
University of Texas Southwestern

Dr. Samuel Achilefu is the inaugural chair and professor of the Department of Biomedical Engineering at the University of Texas Southwestern (UTSW) in Dallas. He is the Lyda Hill Distinguished University Chair and a professor of radiology and the Simmons Comprehensive Cancer Center. Before joining UTSW in February 2022, Dr. Achilefu spent over 20 years at Washington University in St. Louis, MO, where he was the inaugural Michel M. Ter-Pogossian professor of radiology and served as the vice chair for Innovation and Entrepreneurship at the Mallinckrodt Institute of Radiology, director of the Center for Multiple Myeloma Nanotherapy, and director of the Washington University Molecular Imaging Center.

Dr. Samuel Achilefu is an expert in the molecular imaging of human diseases, utilizing multimodal imaging methods to address imaging challenges, focusing on optical imaging platforms. His current research interests include image-guided cancer surgery, portable imaging devices, and nanotechnology. Through a multidisciplinary team of investigators, he has guided multiple research endeavors from concept to clinic.

Dr. Achilefu is an inventor of 71 U.S. patents, published over 300 scientific papers, and received over 30 local, national, and international honors and awards for research excellence, including the first Distinguished Investigator Award (Department of Defense Breast Cancer Research Program), the Britton Chance Biomedical Optics Award, and the St. Louis Award. He is a fellow of many professional societies, including the American Institute for Medical and Biological Engineering, SPIE, Optica (formerly OSA), the Royal Society of Chemistry, AAAS, and the Royal Society of Medicine. Dr. Achilefu is a member of the National Academy of Medicine, the National Academy of Inventors, and the National Advisory Council for Biomedical Imaging and Bioengineering.



Julian Adams, PhD
Stand Up To Cancer

Julian Adams, Ph.D., is president and chief executive officer of Stand Up To Cancer, and among the world's foremost oncology researchers. His long and distinguished career as a leader in drug discovery and development, both as a scientist and pharmaceutical industry senior executive, well prepared him to assume overall management responsibility for SU2C. In this role, Dr. Adams oversees the organization's strategic direction, day-to-day operations, and research investments, while strengthening its relationships with its scientific partner, the American Association for Cancer Research (AACR), and leading researchers and institutions across the oncology space.

Dr. Adams joined Stand Up To Cancer in July 2023 as its first chief science officer responsible for setting strategic priorities that enhance SU2C's research portfolio. Among his first initiatives is sharpening SU2C's research focus on cancer early detection, an effort of particular interest to Dr. Adams and of great promise to the field.

Until his retirement in October 2022, Dr. Adams served as chief executive officer of Gamida Cell (NASDAQ:GMDA), a commercial-stage biopharmaceutical company working to develop cell therapies for blood cancers and rare, serious blood diseases. Prior to joining Gamida Cell, Dr. Adams was president of R&D at Infinity Pharmaceuticals, Inc., where he oversaw development of small molecule drugs to treat cancer. He earlier served in senior research leadership roles at Millennium Pharmaceuticals, Boehringer Ingelheim, LeukoSite, Inc., and ProScript. He is also a former member of SU2C's Scientific Advisory Committee.

Dr. Adams has received numerous awards and recognitions, including the 2012 Warren Alpert Foundation Prize for his role in the discovery and development of bortezomib; the 2012 C. Chester Stock Award Lectureship from Memorial Sloan-

Kettering Cancer Center; and the 2001 Ribbon of Hope Award for Velcade® from the International Myeloma Foundation. He holds more than 40 patents and has authored more than 130 papers and book chapters in peer-reviewed journals.

Dr. Adams received his B.S. from McGill University and his Ph.D. from the Massachusetts Institute of Technology in the field of synthetic organic chemistry. He also received the degree of Doctor of Science, honoris causa, from McGill University in 2012.



Vinod Balachandran, MD, FACS
Memorial Sloan Kettering Cancer Center

Vinod Balachandran, MD, is a surgeon-scientist in the Human Oncology and Pathogenesis Program (HOPP) and Founding Director of The Olayan Center for Cancer Vaccines at Memorial Sloan Kettering Cancer Center (MSK), an academic biohub focused on catalyzing next-generation precision cancer vaccines.

Vinod's laboratory discoveries have established precision vaccines as a promising new immunotherapy for pancreatic cancer, a common, deadly cancer with no effective treatments. His team discovered, designed, and demonstrated in a landmark clinical trial that precision RNA vaccines targeting 'neoantigens' – mutation-derived antigens unique to cancer cells – trigger potent immunity that correlates with delayed pancreatic cancer recurrence. This work revealing that vaccines targeting ubiquitous oncogenic byproducts may impact outcome in one of the most challenging cancers has ignited global interest in RNA vaccines as a potentially transformative cancer treatment.

Vinod has received several honors for his work, including the 2023 Trailblazer Prize for Clinician Scientists from the Foundation for the NIH.



Rashid Bashir, PhD
University of Illinois Urbana-Champaign

Rashid Bashir is Professor of Bioengineering, the Grainger Distinguished Chair in Engineering, and is currently the Dean of Grainger College of Engineering at the University of Illinois at Urbana-Champaign. He has also been the Department Head of Bioengineering and the Director of the Holonyak Micro and Nanotechnology Laboratory at the University of Illinois Urbana-Champaign. He was member of the core founding team for the Carle Illinois College of Medicine, the world's first engineering-based College of Medicine at the University of Illinois Urbana-Champaign. He was a faculty member at Purdue University, where he started his academic career. Prior to that he spent 6 years at National Semiconductor Corporation commercializing analog and RF microelectronics manufacturing technologies.

He has held a Visiting Scientist position at Massachusetts General Hospital and Shriners' Hospital for Children and was Visiting Professor of Surgery at Harvard Medical School, Cambridge, MA. He was the recipient of the Joel and Spira teaching Award, the NSF Faculty Early Career Award, and the IEEE EMBS Technical Achievement award. In 2018, he received the Pritzker Distinguished Lectureship Award from BMES. He also received the 2021 AIMBE Professional Impact Award for Education. He is a member of the Executive Committee and was on the founding team of the Chan Zuckerberg Biohub Chicago.

His research group is interested in micro-fluidics and nanotechnology based diagnostic technologies for precision and personalized medicine, and 3D bio-fabrication of multi-cellular engineered living systems for biological soft robotics and models for drug screening. He has authored or co-authored over 300 journal papers and has been granted over 65 patents. He is a fellow of IEEE, BMES, AIMBE, APS, IAMBE, NAI, RSC, and AAAS. He is academic co-founder of Prenosis, Inc. and VedaBio, Inc. He was elected to the National Academy of Medicine in 2023, and to the American Academy of Arts and Sciences in 2024.

He received his B.S. degree in Electrical Engineering from Texas Tech University and his M.S and Ph.D. in Electrical Engineering from Purdue University.



John P. Cooke, MD, PhD
Houston Methodist Research Institute

Dr. Cooke trained in Cardiovascular Medicine at the Mayo Clinic and obtained a Ph.D. in Physiology there. Subsequently, he became a faculty member at Harvard Medical School, and then Stanford University where he was Professor and Associate Director of the Stanford Cardiovascular Institute until his recruitment to the Houston Methodist Research Institute (HMRI) in July 2013.

Dr. Cooke chairs the *Department of Cardiovascular Science* which generates fundamental insights that transform cardiovascular care. The basic science effort in angiogenesis, atherosclerosis, vascular regeneration, and cardiomyocyte function are carried out by ten faculty using a range of molecular, cellular, physiological, bioinformatics tools and technologies. In addition, the Department of Cardiovascular Sciences provides the infrastructure for about 200 industry-sponsored and investigator initiated trials in cardiovascular diseases.

Dr. Cooke also directs the *Center for RNA Therapeutics*. Dr. Cooke's team developed methods for the synthesis, purification, validation, lyophilization, and delivery of mRNA, and makes RNA constructs for investigators world-wide. *Dr. Cooke has explored the use of mRNA encoding personalized cancer vaccines, with an active IND for an FDA-approved clinical trial in triple negative breast cancer.* His research is funded by the NIH, NASA, BARDA, AHA, CPRIT and industry. Dr. Cooke has published > 500 research papers, reviews and patents (>40,000 citations; h index = 108; Scopus 1-1-25). He was named an Outstanding Inventor of 2015 by the Office of Technology Transfer at Stanford University, and elected to the National Academy of Inventors in 2019; and received the Mayo Clinic Distinguished Alumni Award in 2020. His Center for RNA Therapeutics received the 2021 Innovation Award from the Houston Business Journal; the 2021 Best Academic Team Research, Vaccine Industry Excellence Award, at the 2021 World Vaccine Congress; the 2022 Fire Award, Houston Business Journal, Top Health Care and Life Science Innovators; and was chosen in 2023 to provide a novel RNA vaccine platform for the global vaccine effort of the Coalition for Epidemic Preparedness Initiative.



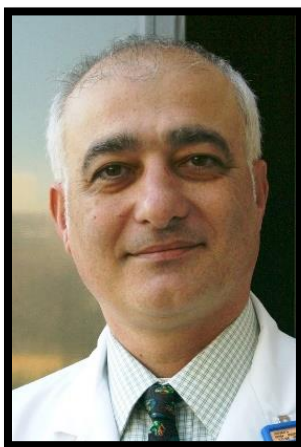
Paula T. Hammond, PhD
Massachusetts Institute of Technology

Professor Paula T. Hammond is Institute Professor at the Massachusetts Institute of Technology and a member of MIT's Koch Institute for Integrative Cancer Research. She is the Vice Provost for Faculty at MIT as of January 2024. She served as the Head of the Chemical Engineering Department at MIT from 2015 to 2023.

The core of Prof. Hammond's work is the use of electrostatics and other complementary interactions to generate functional materials with highly controlled architecture. Her research in nanomedicine encompasses the development of new biomaterials to enable drug delivery from surfaces with spatio-temporal control. She also investigates novel responsive polymer architectures for targeted nanoparticle drug and gene delivery. The newest developments from her lab offer a promising approach to the delivery of proteins, siRNA and mRNA using electrostatic assembly as a means of modifying surfaces, nanoparticles and lipid complexes for targeted systemic delivery, opening potential for vaccines and immunotherapies. Professor Paula Hammond was elected into the National Academy of Science in 2019, the National Academy of Engineering in 2017, the National Academy of Medicine in 2016, and the 2013 Class of the American Academy of Arts and Sciences. She is also a member of the National Academy of Inventors (2021). She received the American Institute of Chemical Engineers (AIChE) Margaret H. Rousseau Pioneer Award for Lifetime Achievement by a Woman Chemical Engineer in 2019 and gave the Materials Research Society (MRS) David Turnbull Lectureship, 2019. Professor Hammond has published over 330 papers, and over 20 patent applications. She is the co-founder and member of the Scientific Advisory Board of LayerBio, Inc., a member of the Scientific Advisory Board of Moderna Therapeutics and a member of the Board of Alector Therapeutics and the Board of Sail Biomedicines, a Flagship company. In 2021, Professor Hammond was selected to become a member of the President's Council of Advisors on Science and Technology

(PCAST). In January 2025, President Biden awarded Professor Hammond the honorable National Medal of Technology and Innovation.

In terms of educational background, Prof. Hammond is from Detroit, Michigan, and received her B.S. in Chemical Engineering from MIT, then worked for two years in industry, moved to Atlanta to get an M.S. in Chemical Engineering at Georgia Tech, before returning to MIT for her PhD. She held the Ford Foundation Dissertation Fellowship, and on completing her PhD, was an NSF Postdoctoral Fellow at the Harvard University Chemistry Department before returning to MIT as a faculty member.



Hossein Jadvar, MD, PhD, MPH, MBA, MSL
University of Southern California

Dr. Hossein Jadvar is a tenured Professor of Radiology with joint appointments in Radiation Oncology, Urology, and Biomedical Engineering at the University of Southern California (USC) in Los Angeles, CA. He is a fellow and past president of both the American College of Nuclear Medicine (ACNM) and the Society of Nuclear Medicine and Molecular Imaging (SNMMI). Dr. Jadvar serves as the Chair for the U.S. Nuclear Regulatory Commission (NRC) Advisory Committee on Medical Uses of Isotopes (ACMUI). He is a director in the American Board of Nuclear Medicine (ABNM). Dr. Jadvar received a BS in chemical engineering for Iowa State University, MS in biomedical engineering from the University of Wisconsin-Madison, MS in computer engineering and PhD in bioengineering both from the University of Michigan-Ann Arbor, MD from the University of Chicago (Pritzker), MPH from Harvard University, and both the executive MBA and the master's in studies of law (MSL) degrees from USC. He completed an internship in internal medicine at UCSF, a diagnostic radiology and nuclear medicine residency at Stanford University, and a clinical

fellowship in nuclear oncology at Harvard Medical School Joint Program in Nuclear Medicine (MGH-BWH-DFCI). He has received many awards, among them, the Academy for Radiology and Biomedical Imaging Research Distinguished Investigator Award, the ACNM Lifetime Achievement Award, and the Distinguished Alumnus Award from the Harvard Medical School Massachusetts General Hospital Department of Radiology. He has been an NIH funded investigator and has served on multiple NIH, DOD, DOE, and CPRIT review panels. He has 269 peer-reviewed journal articles, numerous conference abstracts and full articles, published 4 books and 41 book chapters, has been awarded 9 U.S. and European patents, and has had more than 300 invited lectureships and visiting professorships at national and international venues and universities. His research interests include translational molecular imaging research with major focus on prostate cancer, theranostics, and radiopharmaceutical therapy.



Carl H. June, MD
University of Pennsylvania

Carl H. June, MD, is the Richard W. Vague Professor of Immunotherapy in the Department of Pathology and Laboratory Medicine. He is currently Director of the Center for Cellular Immunotherapies at the Perelman School of Medicine, and Director of the Parker Institute for Cancer Immunotherapy at the University of Pennsylvania. Dr. June is a graduate of the Naval Academy in Annapolis and Baylor College of Medicine in Houston (1979). He had graduate training in immunology and malaria with Dr. Paul-Henri Lambert at the World Health Organization in Geneva, Switzerland from 1978-1979, and post-doctoral training in transplantation biology with E. Donnell Thomas and John Hansen at the Fred Hutchinson Cancer Research Center in Seattle from 1983-1986. Dr. June is board-certified in Internal Medicine and Medical Oncology. He maintains a research

laboratory that studies various mechanisms of lymphocyte activation that relate to immune tolerance and adoptive immunotherapy for cancer and chronic infection. In 2011, his research team published findings detailing a new therapy in which patients with refractory and relapsed chronic lymphocytic leukemia were treated with genetically engineered versions of their own T cells, now called CAR T. The treatment was the first cell or gene therapy to receive FDA approval. CAR T were first approved to treat children and young adults with refractory acute lymphoblastic leukemia, and as of 2023, CAR T is approved for 6 different kinds of blood cancer. Dr. June has published more than 500 manuscripts and was elected to the Institute of Medicine, the American Academy of Arts and Sciences, the National Academy of Sciences

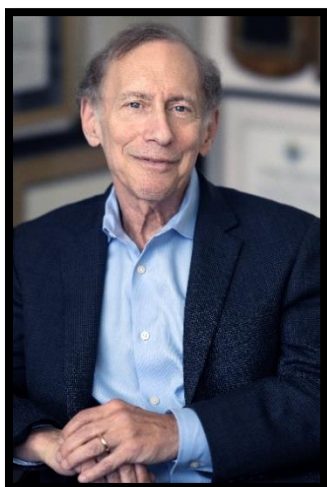
and American Philosophical Society. He is the recipient of numerous prizes and honors, including the William B. Coley Award, the Richard V. Smalley, MD Memorial Award from the Society for Immunotherapy of Cancer, the AACR-CRI Lloyd J. Old Award in Cancer Immunology, the Philadelphia Award, the Taubman Prize for Excellence in Translational Medical Science (shared with S. Grupp, B. Levine, and D. Porter), the Paul Ehrlich and Ludwig Darmstaedter Prize (shared with J. Allison), the Novartis Prize in Immunology (shared with Z. Eshhar and S. Rosenberg), the Karl Landsteiner Memorial Award, the Debrecen Award for Molecular Medicine, and a lifetime achievement award from the Leukemia and Lymphoma Society and the American Association for Cancer Research. Most recently, Dr. June was named a winner of the 2024 Breakthrough Prize for Life Sciences (shared with M. Sadelain).



Kayvan R. Keshari, PhD
Memorial Sloan Kettering Cancer Center

Dr. Kayvan R. Keshari received degrees in Biochemistry, Mathematics and Biomedical Engineering from the University of California, Berkeley and University of North Carolina, Chapel Hill respectively, after which he completed postdoctoral training at the University of California, San Francisco (UCSF) in Biomedical imaging and Bioengineering under the supervision of Prof. John Kurhanewicz. He joined Memorial Sloan Kettering Cancer Center in 2013 and is currently the Fred Lebow Chair, Member (Professor) and Laboratory Head, with appointments in both the Department of Radiology and the Molecular Pharmacology Program. In addition, he is the Director of the Center for Molecular Imaging and Bioengineering (CMIB). He is a Professor in the Gerstner Sloan Kettering School of Biomedical Sciences, founding Co-Director of the PhD program in Cancer Engineering and in multiple departments at Cornell University including Chemical Biology, Biophysics and Biochemistry. At MSK, the Keshari lab focuses on the

interrogation of cancer metabolic processes and development of advanced multi-modality imaging. With changes in cancer metabolism as the driving force, the lab is interested in fundamental biochemical rates *in vivo* and mechanisms that can dramatically affect metabolic flux such as the redox state of the cell. Novel tools are developed to interrogate and exploit these mechanisms, which underlie fundamental cancer biology, drive aggressiveness and response to therapeutics. Leveraging these approaches, the lab aims to develop novel strategies to therapeutically target cancer.



Robert Langer, ScD
Massachusetts Institute of Technology

Dr. Bob Langer is one of nine Institute Professors at the Massachusetts Institute of Technology (MIT), MIT's highest faculty honor. His pioneering work, which has benefited millions worldwide, includes isolating the first angiogenesis inhibitors (with Dr. Judah Folkman) leading to new treatments for cancer and blindness. He also created the first nanoparticles and microparticles for delivering large molecules, including nucleic acids, and helped establish the field of tissue engineering which enabled artificial skin for burn victims and organ-on-a-chip technology. Despite initial skepticism—his first nine grants were rejected, and no engineering department would hire him—Langer has authored more than 1,600 papers, cited more than 445,000 times. With an h-index of 331, Langer is the most cited engineer in history. His patents have been licensed or sublicensed to over 400 companies, and he has co-founded more than 40 ventures, including Moderna.

Langer chaired the FDA's Science Board from 1999–2002 and has received over 220 awards, including the U.S. National Medal of Science and the National Medal of Technology and Innovation (one of only three living individuals to receive both). His accolades include the Draper Prize (considered engineering's Nobel Prize), Queen Elizabeth Prize for Engineering, Albany Medical Center Prize, Breakthrough Prize in Life Sciences, Kyoto Prize, Wolf Prize in Chemistry, Millennium Technology Prize, and the Kavli Prize in Nanoscience. He holds 44 honorary doctorates from institutions such as Harvard, Yale, Columbia, and the University of Oxford, and has been elected to the National Academies of Medicine, Engineering, and Sciences, as well as the National Academy of Inventors.



Anant Madabhushi, PhD
Emory University

Dr. Anant Madabhushi is the Robert W Woodruff Professor of Biomedical Engineering; and on faculty in the Departments of Pathology, Biomedical Informatics, Urology, Radiation Oncology, Radiology and Imaging Sciences, Global Health and Computer and Information Sciences at Emory University. He is also a Research Career Scientist at the Atlanta Veterans Administration Medical Center. Dr. Madabhushi has authored over 500 peer-reviewed publications and more than 200 patents either issued or pending in the areas of artificial intelligence, radiomics, medical image analysis, computer-aided diagnosis, and computer vision.

He is a Fellow of the American Institute of Medical and Biological Engineering (AIMBE), Fellow of the Institute for Electrical and Electronic Engineers (IEEE) and a Fellow of the National Academy of Inventors (NAI). His work on "Smart Imaging Computers for Identifying lung cancer patients who need chemotherapy" was called out by Prevention Magazine as one of the top 10 medical breakthroughs of 2018. In 2019, Nature Magazine hailed him as one of 5 scientists developing "offbeat and innovative approaches for cancer research". In 2019, 2020, 2021 and 2022 Dr. Madabhushi was named to The Pathologist's Power List of 100 inspirational and influential professionals in pathology. He is also an entrepreneur having started three companies, Elucid Bioimaging, Ibris Inc and Picture Health. In 2019, Elucid Bioimaging attained FDA approval for one of his technologies on the use of AI for carotid plaque characterization.



David Mooney, PhD
Harvard University

David Mooney is the Pinkas Family Professor of Bioengineering in the Harvard School of Engineering and Applied Sciences, and a Core Faculty Member of the Wyss Institute. His laboratory designs biomaterials to promote regeneration and immunotherapy. He is a member of the National Academy of Engineering, the National Academy of Medicine, and the National Academy of Inventors. His inventions have been licensed by over 20 companies, leading to commercialized products. He has founded companies, and is active on industrial scientific advisory boards.



Cynthia A. Reinhart-King, PhD
Rice University

Cynthia Reinhart-King is the John W. Cox Professor and Department Chair in the Department of Bioengineering at Rice University. Before joining Rice, she was a University Distinguished Professor in Biomedical Engineering and Cell and Developmental Biology at Vanderbilt University, where she also served as Senior Associate Dean for Research in the School of Engineering. She obtained undergraduate degrees in Chemical Engineering and Biology at MIT and her PhD at the University of Pennsylvania in the Department of Bioengineering. Her lab's research interests are cell and tissue mechanobiology in cancer and atherosclerosis. She was awarded the Rita Schaffer Young Investigator Award and the inaugural Mid-Career Award from the

Biomedical Engineering Society, an NSF CAREER Award, the Sonny Yau '72 Excellence in Teaching Award, a Cook Award for "contributions towards improving the climate for women at Cornell," the Zellman Warhaft Commitment to Diversity Award from the Cornell College of Engineering, the Vanderbilt Chancellor's Award for Research and the Edward J. White Service Award from the Vanderbilt University School of Engineering. She is a fellow of the Biomedical Engineering Society, the American Institute for Medical and Biological Engineering (AIMBE), and the International Academy of Medical and Biological Engineering, and she was an inaugural New Voices Fellow of the National Academies of Science,

Engineering and Medicine. She served as a standing member of the NIH CMT study section panel, an elected Board Member of AIMBE, Secretary and Elected Board member of BMES, and Chair of the Diversity and Inclusion Committee of AIMBE. She is the current Past-President of the Biomedical Engineering Society.



Katy Rezvani, MD, PhD, FRCP, FRCPath
University of Texas MD Anderson Cancer Center

Katy Rezvani, MD, PhD is a professor of medicine at the University of Texas MD Anderson Cancer Center, where she serves as the Vice President & Head, Cell Therapy Institute for Discovery and Innovation, Sally Cooper Murray Chair in Cancer Research, and medical director of the GMP Facility. She leads a research lab with a focus on NK cell biology and developing novel NK cell engineering strategies for cancer, with the aim of translating these discoveries to the clinic. Dr. Rezvani completed her medical training at University College London, England and her PhD at Imperial College London. She completed her training in immunology and transplantation biology at the National Institutes of Health, Bethesda, MD. In addition, she has co-authored over 250 peer-reviewed publications and received multiple prizes and awards, including the American Society of Hematology E. Donnall Thomas award.



Rebecca Richards-Kortum, PhD
Rice University

Rebecca Richards-Kortum, Ph.D. is the Rice University Malcolm Gillis University Professor of Bioengineering and co-Director of Rice 360 Institute for Global Health. Her research has been instrumental in improving early detection of cancers and in developing and scaling affordable technologies to improve newborn and maternal health, especially in low-resource settings. She is a recipient of a MacArthur Fellowship and a member of the US National Academy of Sciences, the National Academy of Engineering, the National Academy of Inventors, the American Academy of Arts and Sciences, and the American Philosophical Society. She received her PhD in Medical Physics from MIT and her BS in Physics and Mathematics from the University of Nebraska.



Ze'ev Ronai, PhD
Cedars-Sinai Medical Center

Ze'ev A. Ronai is an expert in cancer biology, holding a Ph.D. in Tumor Immunology from the Hebrew University in Jerusalem, Israel. Following postdoctoral research at Columbia University was tenured at Mount Sinai School of Medicine in New York. Subsequently, he joined Sanford Burnham Prebys Medical Discovery Institute in La Jolla, CA (SBP) where he served as Program Director and the Associate, the Deputy and later as the Director of the NCI-designated basic Cancer Center, and the Scientific Director of the SBP La Jolla site.

Research interests include studies on the stress response, focusing on epigenetic regulators, including ubiquitin ligases, as they pertain to cancer development, progression, and therapy resistance. Recent studies led to clinical trials and set new paradigms in understanding cancer biology.

Dr. Ronai has over 300 peer-reviewed publications, including reviews and book chapters, which received ~30,000 citations. Supported by federal grants, including the Outstanding Investigator Award, Dr. Ronai has served on advisory committees, including institutional SABs and grant review panels at the NCI, DOD, and worldwide. Led the SAC for the Melanoma Research Foundation and chaired the vision committee for melanoma at the DOD (CDMRP). Dr. Ronai has served on editorial boards of several journals and was the Editor in Chief of the melanoma journal, PCMR. Received the Life-Time Achievement Award from the Society of Melanoma Research and obtained several prestigious invitations as Dean and Keynote lecturer and invited to the Karolinska Noble Conferences.

Concurrently with his research activities in La Jolla, Dr. Ronai established the TICC - Technion Integrated Cancer Center at the Israel Institute of Technology (Technion) in Haifa, Israel, which was set to empower computational and biological sciences with integrated advanced engineering principles to develop innovative solutions to unmet needs in cancer research, understanding, prevention, and treatment.

Dr. Ronai is currently the Director of the Translational Research Institute at Cedars Sinai Medical Center in Los Angeles CA, USA.



W. Gregory Sawyer, PhD

Moffitt Cancer Center, University of Florida

W. Gregory Sawyer is a professor, engineer, scientist, cancer researcher and cancer survivor who has turned his attention from space systems to exploring new frontiers in the battle against cancer. Greg was a member of the original Mars Rover design team at NASA's Jet Propulsion Laboratory, and his approach to cancer research follows a multidisciplinary team approach. A major goal of his research is to allow scientists to visualize and interact with cancer using bio-printing techniques and other tools pioneered in Soft Matter Engineering. Greg is a member of the National Academy of Inventors, Tribology Gold Medal winner, holds over 20 patents, has authored over 200 scientific publications, has been cited over 20,000 times, and has mentored over 20 PhD students – many of whom are now faculty members and researchers working at the interfaces between engineering, science, and biomedicine.



Mehmet Toner, PhD

Massachusetts General Hospital

Dr. Toner received BS degree from Istanbul Technical University and MS degree from the Massachusetts Institute of Technology (MIT), both in Mechanical Engineering. Subsequently he completed his PhD degree in Medical Engineering at Harvard-MIT Division of Health Sciences and Technology in 1989. Currently, he holds the Helen Andrus Benedict Professor of Biomedical Engineering at the Massachusetts General Hospital, Harvard Medical School, and Harvard-MIT Division of Health Sciences and Technology. He serves as the Director of Research at the Shriners Hospitals for Children in Boston. Dr. Toner is also the Co-Director of the Center for Engineering in Medicine & Surgery at the MGH. He was recognized by the "YC Fung Young Award in Bioengineering", "H.R. Lissner Medal", and "Savio L-Y Woo Translational Biomechanics Award", all from the American

Society of Mechanical Engineering. He also received the "Luyet Medal" from the Society for Cryobiology. Dr. Toner is inducted to the Turkish Academy of Science, US National Academy of Medicine, US National Academy of Inventors, and US National Academy of Engineering. His research involves microfluidics, nano- and micro-technologies, tissue engineering and regenerative medicine, and cryobiology. He co-founded multiple biotechnology companies.



Omid Veischi, PhD

Rice University

Dr. Omid Veischi, Ph.D., is a Professor and CPRIT Scholar in Cancer Research in the Departments of Bioengineering and Chemical and Biomolecular Engineering at Rice University. He is also the Director of Rice University's Biotech Launch Pad, a new initiative with a mission to accelerate the translation of Rice University discoveries and technologies into clinical practice to provide rapid patient access to leading-edge therapeutic products. He leads an interdisciplinary translational research program to engineer and commercialize next-generation cell-based therapeutics for various human diseases. His team leverages the latest techniques in synthetic biology, immunoengineering, and materials science to develop innovative cell-based platforms for

real-time and feedback-regulated production of biologics. Throughout his career, he has authored or co-authored more than 80 peer-reviewed publications, including those in *Nature*, *Nature Biotechnology*, *Nature Materials*, *Nature Medicine*, and *Nature Biomedical Engineering*. He is an inventor on more than 50 pending or awarded patents. He is also a serial entrepreneur who has co-founded multiple biotechnology companies, collectively attracting ~ \$500M in private and public investment capital. Dr. Veisheh has been elected as a fellow of the Controlled Release Society and a member of the National Academy of Inventors.



Cheryl L. Willman, MD
Mayo Clinic

Cheryl L. Willman, M.D. serves as Executive Director of Mayo Clinic Cancer Programs and Director of the Mayo Clinic Comprehensive Cancer Center. She is a Professor and Consultant of Laboratory Medicine and Pathology in the Mayo Clinic College of Medicine and Science and holds the David A. Ahlquist Endowed Professorship in Cancer Research. An internationally renowned physician scientist and cancer center leader, Dr. Willman leads the three site National Cancer Institute (NCI)-Designated Mayo Clinic Comprehensive Cancer Center across the Mayo Clinic campuses in: Rochester, Minnesota and the Mayo Clinic Health System, a rural health care delivery system across the Upper Midwest; Phoenix and Scottsdale, Arizona; and Jacksonville, Florida. In 2024, these sites together provided care for more than 142,000 cancer patients.

Dr. Willman is a pioneer in the field of hematologic malignancies, cancer genetics and genomics, and cancer precision medicine with a track record of innovation and successful translation of her discoveries to novel diagnostics and therapeutics tested in national and institutional clinical trials. She has been continuously funded by the National Institutes of Health, the NCI, and the Leukemia & Lymphoma Society for more than 40 years. She is a highly cited physician-scientist who has published over 300 papers reporting her work in high quality medical and scientific journals (h-index: 111; i-10: 280) and holds 11 patents or patents pending.

Dr. Willman previously served as Director and CEO of the University of New Mexico Comprehensive Cancer Center which under her leadership developed into one of the nation's preeminent NCI-designated Cancer Centers. She has led or co-led several national initiatives focused on improving the lives of patients with cancer and addressing disparities in cancer incidence and mortality among U.S. populations. She has also led the translational science programs and directed scientific studies in the several of the nation's NCI Cooperative Clinical Trials Groups, including the Southwest Oncology Group and the Children's Oncology Group. She currently serves as Principal Investigator of one of the nation's 5 NCI-funded *Participant Engagement-Cancer Genome Sequencing Centers: Engagement of American Indians of Southwestern Tribal Nations in Cancer Genome Sequencing*. This program is engaging Tribal leaders, communities, and cancer patients to deliver state of the art comprehensive clinical genomic sequencing, cancer genetic counseling, and navigation to cancer treatment and clinical trials. The overall goal is to identify the spectrum of cancer-associated genomic mutations and mutational signatures and enhance access to state-of-the-art diagnostics and care.

Dr. Willman has served in many leadership roles at NCI (Board of Scientific Advisors, Board of Scientific Counselors, and the Scientific Advisory Board of the Frederick National Laboratory for Cancer Research, overseeing science in genomics, drug discovery, nanotechnology, computing and large-scale data analysis) and in the nation's Department of Energy (DOE) laboratories (chairing the Bioscience Review Panels for Los Alamos and Sandia National Laboratories). She also has held many national leadership positions in professional organizations, including the American Association of Cancer Research, the American Society of Hematology, and the Leukemia and Lymphoma Society. She was a founder of the field of Molecular Diagnostic Pathology and President of the Association of Molecular Pathologists. She is an elected fellow of the National Academy of Inventors. Dr. Willman received her medical degree at Mayo Medical School, now Mayo Clinic Alix School of Medicine and completed her residency and postdoctoral training in pathology and cancer research at Mayo Clinic, University of New Mexico, and University of Washington.



Robert A. Winn, MD

Massey Comprehensive Cancer Center, Virginia Commonwealth University

Robert A. Winn, MD, is the Director of Virginia Commonwealth University (VCU) Massey Comprehensive Cancer Center. He is also senior associate dean for cancer innovation at the VCU School of Medicine, and professor at the Division of Pulmonary Disease and Critical Care Medicine at VCU. His current basic science research focuses on the translational aspects of the role that proliferation pathways and cellular senescence play in lung cancer. Winn has also brought the importance of the concept of ZNA (i.e., one's zip code or neighborhood of association) and its impact on DNA and biological outcomes to the forefront in basic and translational research. His findings in this area have driven several important studies and has truly advanced the science of health equity. He is a principal investigator on several community-based projects funded by the NIH and

National Cancer Institute. Winn is the President of the Association of American Cancer Institutes (AACI); Chair of the National Cancer Policy Forum of the National Academies of Sciences, Engineering, and Medicine; and a member of the Board of Directors for the American Cancer Society and LUNgevity Foundation. Winn holds a BA from the University of Notre Dame and an MD from the University of Michigan Medical School in Ann Arbor. He completed an internship and residency in internal medicine at Rush-Presbyterian-St. Luke's Medical Center in Chicago and a fellowship in pulmonary and critical care medicine at the University of Colorado Health Sciences Center in Denver.



Nastaran Zahir, PhD

Center for Cancer Training, National Cancer Institute, National Institutes of Health

Dr. Nastaran Zahir is Deputy Director of the Center for Cancer Training and Branch Director of the Cancer Training Branch at the National Cancer Institute (NCI). Dr. Zahir leads strategic initiatives for training in cancer research and designs operational frameworks for a portfolio of over a thousand fellowships, training grants, research education, and career development programs with annual NCI investments of over \$230M. Dr. Zahir strives to foster collaborative team science and support cancer education, outreach, and advocacy activities spanning the cancer research continuum. In 2023, Dr. Zahir was inducted as a fellow of the American Institute for Medical and Biological Engineering where she was recognized for her advocacy of training and support for engineering approaches to cancer research. Since 2023, she has served as vice co-chair of the National Institutes of Health (NIH) Training Advisory Committee, which offers advice and recommendations across NIH on policy development, implementation, and enhancement of biomedical and behavioral research training, career development and

education activities. In 2020, Dr. Zahir served as Chair of the NCI Early Stage Investigator Activities Committee, which plays a key role in planning and implementing NCI priorities for scholars early in their research careers.

Prior to joining the Center for Cancer Training, Dr. Zahir served as Associate Director at the NCI Division of Cancer Biology from 2013-2021 where she coordinated interdisciplinary programs that integrate physical sciences and engineering perspectives and approaches with cancer research. Dr. Zahir joined NCI in 2009 as a program director and project scientist in the Office of Physical Sciences-Oncology after concluding a postdoctoral fellowship as an NIH intramural research training awardee. Dr. Zahir's research experience has been in tissue engineering and regenerative medicine at NIH during her postdoctoral fellowship, breast cancer mechanobiology at the University of Pennsylvania Department of Bioengineering for her doctoral training, and plasma physics and radiation biology as an undergraduate at the University of California, Berkeley Department of Nuclear Engineering. Throughout her career, Dr. Zahir has co-authored research publications in biological and physical sciences. She has also taught undergraduate courses in cancer biology at the University of Pennsylvania and graduate courses in tissue engineering and regenerative medicine at the NIH Foundation for Advanced Education in the Sciences.

POSTER EXHIBITION PRESENTERS AND HONORABLE MENTION ABSTRACT AUTHORS

POSTER TITLES, AUTHORS, AND AFFILIATIONS



A WORKSHOP

NATIONAL ACADEMIES Sciences
Engineering
Medicine

Cancer Engineering

**The Convergence of Engineering and Health
to Advance Cancer Research and Care**

Day 1 May 20 · 8:30AM – 4:30PM ET
Poster Session · 4:30PM – 5:30PM ET

Day 2 May 21 · 8:30AM – 11:30AM ET

The poster session will take place before the workshop reception:
Tuesday, May 20, 2025, from 4:30pm to 5:30pm ET

Find the poster PDFs archived online on the
[Cancer Engineering Workshop Poster Session Webpage](#)

Biomimetic peritoneal cavity-on-a-chip for studying cancer progression and metastasis

Rana J. Abbed, University of Illinois Urbana-Champaign

Metabolic reprogramming in 3D ex-vivo lung adenocarcinoma cancer models

Suehelay Acevedo Acevedo, H. Lee Moffitt Cancer Center and Research Institute

Weakly supervised cancer grading using rank-aware contextual reasoning on whole slide images

Anirudh Choudhary, University of Illinois Urbana-Champaign

Micro-milled high-throughput force sensor array for in situ mechanical testing of tumors-on-a-chip

Bashar Emon, University of Illinois at Urbana-Champaign

Effects of fluid shear stress on the metastatic potential of circulating tumor cells

Marie Floryan, Massachusetts Institute of Technology

Engineering high-fidelity early cancer models: Single-cell bioprinting in 2D and 3D to mimic the native tumor microenvironment

Haylie R. Helms, Oregon Health and Science University**

Novel mixed-cancer cell models designed to capture inter-patient tumor heterogeneity for accurate evaluation of drug combinations

Sampreeti Jena, University of Minnesota, Minneapolis**

Plasmonic gold nanorods for laser thermal therapy of gliomas in vitro and in tissue-mimicking phantoms

Rebecca J. Johnson, University of Maryland, College Park

Engineering a dual-antigen targeting cell-based therapy directed against CD70 and active integrin $\beta 2$ for acute myeloid leukemia

Amrik S. Kang, University of California, San Francisco**

Targeting VEGF-A induced lymphatic remodeling as a new approach to boost immunity in PDAC

Anna Kolarzyk, Cornell University

Tumor-wide RNA splicing aberrations generate immunogenic public neoantigens across various cancers

Darwin W. Kwok, University of California, San Francisco

One-step engineering of allogeneic CAR-NK cells with enhanced anti-tumor activity and resistant to rejection

Fuguo Liu, Massachusetts Institute of Technology; Dana-Farber Cancer Institute, Harvard Medical School

Enhancing interdisciplinary training through biodesign: Development of a tumor margin tracking system

Alexandra McLennan, University of Texas MD Anderson; Rice University; Baylor College of Medicine

Characterizing the immunosuppressive role of myeloid-derived suppressor cells in glioblastoma under radiotherapy

John Metzcar, University of Minnesota-Twin Cities

Dielectrophoretic analysis of peripheral blood mononuclear cells in Stage III and IV breast cancer models

Raphael Oladokun, West Virginia University

Embedded bioprinting of immunocompetent tumor models via microporogen-structured collagen matrices
Daniel S. Reynolds, Harvard University

Science simplified - A digital strategy to promote cancer research and raise awareness and inspire
Craig Richard, University of Illinois Urbana-Champaign

An automated, standardized and open-source end-to-end pipeline using multiplexed immunofluorescence imaging reveals clinically prognostic spatial metrics in triple-negative breast cancer post-neoadjuvant chemotherapy
Abishek Sankaranarayanan, University of Washington

FGF1 regulates breast cancer growth and metabolic reprogramming through ETV4
Barbara Mensah Sankofi, University of Oklahoma Health Sciences Center

Phosphatase-excluding polymer micropatches for enhancing cytotoxic T-lymphocytes-based cancer therapy
Suyog Shaha, Harvard University**

Ultrasensitive protein detection using proximity initiated nucleic acid target amplification with photonic digital detection
Skye Shepherd, University of Illinois at Urbana-Champaign

Targeted lipid nanoparticle-encapsulated PROTAC delivery inhibits senescent pancreatic ductal adenocarcinoma
Ashley Sullivan, Memorial Sloan Kettering Cancer Center

Engineering dormancy: Insights from a 3D model of microscopic colorectal cancer liver metastasis
Sabrina N. VandenHeuvel, Texas A&M University

Extracellular matrix hydrogel provides on-demand tuning of viscoelastic properties to mimic development of myelofibrosis
Kexin Zhang, University of Pennsylvania

3D multi-modal photoacoustic and super-resolution ultrasound localization imaging to probe the tumor microenvironment
Shensheng Zhao, University of Illinois at Urbana-Champaign**

**** Will give a 5-minute oral presentation during Session 5 of this workshop**

HONORABLE MENTION ABSTRACT AUTHORS

(Abstracts can be found in the
Poster Exhibition Packet archived on the [Workshop Webpage](#))



Perfusion-based 3D chemotactic platform for high-resolution studies of cellular migration and tumor microenvironment modeling

Said Cifuentes, H. Lee Moffitt Cancer Center and Research Institute

Developing a paper-based assay detecting TOP2A protein for point-of-care cervical cancer screening

Sayeh Dowlatshahi, Purdue University

Engineering DNA nanostructures for targeted cancer therapy

Abhisek Dwivedy, University of Illinois at Urbana-Champaign

Engineering sonogenetic EchoBack-CAR T cells

Peixiang He, University of Southern California; University of California, San Diego

Photo-activated combinatorial microRNA delivery induces apoptosis in head and neck cancer

Angelica Helton, The Pennsylvania State University

Minimalizing tissue damage during tumor resection with digit integrated tumor curette: A proof of concept

Caroline Miller, Texas A&M School of Engineering Medicine

3D high density collagen I improves modeling of metastatic pancreatic cancer

Kim Nguyen-Ta, University of California, San Diego

Nanotechnology-assisted photoimmunotherapy to overcome drug delivery barriers for peritoneal metastasis

Sumiao Pang, University of Maryland, College Park

The mechanical influence of TPD52L2 on cellular rigidity via the actin-cytoskeleton in breast cancer cells

Amirabbas Parizadeh, University of California, San Francisco

A rapid 3D in vitro drug screening platform of glioblastoma utilizing hydrogel microparticle encapsulation

Brittany A. Payan, University of Illinois Urbana-Champaign

Application of polarization sensitive optical coherence tomography to evaluate surgical margins in head and neck cancer

Sindhura Sridhar, Vanderbilt University Medical Center

MetaboCore: A rapid companion diagnostic drug sensitivity assay for functional precision oncology

Yin Tang, Institute for Systems Biology

In silico reconstruction of primary and metastatic estrogen receptor positive breast tumor architecture using geographic information science-augmented spatial transcriptomics

Jin Young Yoo, University of Illinois Urbana-Champaign

Photo Session, Student Assembly, and Poster Presentation Session Guidance on Day 1

Tuesday, May 20, 2025

Photo Session: 12:25pm - 12:40pm (Auditorium or the Albert Einstein Memorial)

Coordinators:

*Workshop Planning Committee Co-chairs
National Academies Staff*

- Group photos with workshop planning committee, speakers, and all postdoctoral fellows and students
- Individual photos with planning committee and poster presenters

Student Assembly: 12:55pm- 1:20pm (Lecture Room)

Coordinators:

*Rohan Fernandes, The George Washington University
Hadiyah-Nicole Green, Ora Lee Smith Cancer Research Foundation
National Academies Staff*

- Provide dedicated space for all postdoctoral fellows and students attending the workshop to learn about current trends in their fields and network with other students, workshop planning committee members, and speakers.
- Workshop planning committee members and speakers are invited to attend.

Poster Exhibition: 4:30pm - 5:30pm (West Court)

Coordinators:

*Rohan Fernandes, The George Washington University
Hadiyah-Nicole Green, Ora Lee Smith Cancer Research Foundation
Jen Zhu, National Academies Staff*

- All posters will be mounted in the morning and will be available for viewing throughout the day, but the poster presentation session will begin at 4:30pm.

First half hour of poster presentation session, 4:30 - 5:00pm ET

Odd-numbered poster presenters [1, 3, 5...] will stand by their posters to interact with participants.

Even-numbered poster presenters [2, 4, 6...] can visit/interact with other poster presenters in the session.

Second half hour, 5:00 – 5:30pm ET

Even-numbered poster presenters [2, 4, 6...] will stand by their posters to interact with participants.

Odd-numbered poster presenters [1, 3, 5...] can visit/interact with other poster presenters in the session



National Cancer Policy Forum

The National Cancer Policy Forum serves as a trusted venue in which experts can identify emerging high-priority policy issues in cancer research and cancer care and work collaboratively to examine those issues through convening activities focused on opportunities for action. The forum provides a continual focus within the National Academies on cancer, addressing issues in science, clinical medicine, public health, and public policy that are relevant to the goal of reducing the cancer burden through prevention and by improving the care and outcomes for those diagnosed with cancer. Forum activities inform the cancer community and the public about critical policy issues through workshops and published reports. The forum has members with a broad range of expertise in cancer, including patient advocates, clinicians, and basic, translational, and clinical scientists. Forum members represent patients, federal agencies, academia, professional organizations, nonprofits, and industry.

The forum has addressed a wide array of topics, including

- enhancing collaborations to accelerate research and development;
- improving the quality and value of care for patients who have been diagnosed with or are at risk for cancer;
- developing tools and technologies to enhance cancer research and care; and
- examining factors that influence cancer incidence, mortality, and disparities.



Upcoming and Recent Workshops

Policy Issues for Integrating Artificial Intelligence in Cancer Research and Care

Collaborative workshop co-hosted by:

National Cancer Policy Forum

Computer Science and Telecommunications Board

March 9-10, 2026

The use of artificial intelligence (AI) in healthcare has been growing rapidly in recent years. It is increasingly recognized for its transformative potential in healthcare, particularly in oncology. This workshop will examine the current and potential future uses of AI in cancer care, and discuss ways to anticipate and address challenges related to the integration of these technologies in the care of patients with cancer. With a focus on the responsible and effective use of AI in oncology, the workshop will consider current policy initiatives across health care and the unique needs for oncology care.

[Workshop Website in Development](#)

Innovative Person-Centered Clinical Cancer Research

September 29-30, 2025

Person-centered clinical research can positively influence the outcomes of clinical research by providing a more accurate representation of real-world patient experiences. It addresses questions that are informed by patient experiences, needs, and perspectives, and involves patients in all stages of research, including design, activation, enrollment, data collection, completion, and outcome reporting. Although patient-reported outcome measures may offer potential benefits for clinical cancer research, challenges in the completeness, reliability, and validity of the data persist. This workshop will examine opportunities to overcome these challenges to advance the conduct of innovative, person-centered clinical cancer research to improve outcomes for all patients.

[Learn more and register here](#)

Strategies and Interventions to Strengthen Support for Family Caregiving and to Alleviate Caregiver Burden

Collaborative workshop convened by:

Roundtable on Quality Care for People with Serious Illness

National Cancer Policy Forum

Forum on Aging, Disability, and Independence

June 5-6, 2025

While unpaid, family caregivers can derive significant satisfaction and other positive benefits from caring for a loved one, research reveals that caregivers experience significant physical, psychological, emotional and financial burdens and a decline in their own physical and emotional health as a result of caring for people living with serious illness. This workshop will discuss evidence-based interventions and strategies that effectively address the physical, mental, and financial challenges of caregiving.

[Learn more and register here](#)

Cancer Engineering: The Convergence of Engineering and Health to Advance Cancer Research and Care

Collaborative workshop co-hosted by:

National Cancer Policy Forum

Board on Mathematical Sciences and Analytics

Board on Life Sciences

May 20-21, 2025

The concept of cancer engineering involves the application of engineering principles to solve challenges across cancer research and cancer care. This multidisciplinary approach brings together the fields of biology, engineering, and health care to devise innovative solutions that enhance the effectiveness, accessibility, and affordability of cancer care. This workshop will consider opportunities to improve patient outcomes through the convergence of engineering with oncology practice, research, and policy.

[Workshop videos and presentations](#)

Addressing the Impact of Tobacco and Alcohol Use on Cancer-Related Health Outcomes

Collaborative workshop convened by:

National Cancer Policy Forum

Forum on Mental Health and Substance Use Disorders

March 17-18, 2025

The use of both alcohol and tobacco has independent and synergistic health effects, including links to many different cancers. There is a clear need to better understand the impact of dual use on cancer incidence and outcomes, to improve public education, and to develop oncology clinical practice guidelines for patients who use alcohol and tobacco. This workshop examined the current state of the science and explore strategies to reduce tobacco and alcohol use to lower cancer risk and improve health outcomes.

[Workshop videos and presentations](#)

Examining Clinical Guidelines for the Adoption of Genomic Testing

Collaborative workshop convened by:

Roundtable on Genomics and Precision Health

National Cancer Policy Forum

October 29, 2024

Clinical practice guidelines can impact adoption of new technologies into routine medical care. This workshop examined how guidelines for genomic testing are developed by various organizations, with a focus on exploring inconsistencies across guidelines and opportunities for a possible path forward for more consistent clinical guidelines for genomics to improve patient care.

[Workshop videos and presentations](#)

[Proceedings-In-Brief](#)

Recent Workshops

Opportunities and Challenges for the Development and Adoption of Multicancer Detection Tests

October 28-29, 2024

Cancer screening is considered a key cancer control strategy because patients who are diagnosed with earlier stages of disease often have better treatment options and improved health outcomes. However, effective screening tests are lacking for most cancers. The development of minimally invasive approaches to screen for multiple tumor types at once could address this unmet need, but the clinical utility of multicancer detection (MCD) testing has yet to be established.

[Workshop videos and presentations](#)

[Proceedings](#)

Enabling 21st Century Applications for Cancer Surveillance Through Enhanced Registries and Beyond

July 29-30, 2024

Population-based cancer surveillance has a pivotal role in assessing the nation's progress in cancer control. Cancer surveillance helps inform research and care interventions aimed at reducing the burden of cancer on patients and communities, including the ability to identify health disparities in cancer outcomes. Surveillance data are crucial for identifying emerging trends in health outcomes and opportunities to improve the quality of cancer care. However, challenges with the current approach to cancer surveillance in the United States include delays and gaps in data collection, as well as inadequate infrastructure and workforce to keep pace with the informatics and treatment-related advances in cancer. The National Cancer Policy Forum convened a public workshop to examine opportunities to enhance and modernize cancer surveillance in order to improve cancer research, care, and outcomes for all patients.

[Workshop videos and presentations](#)

[Proceedings](#)

Toward a Framework to Improve Diversity and Inclusion in Clinical Trials

Collaborative workshop convened by:

Forum on Drug Discovery, Development, and Translation
National Cancer Policy Forum

May 20, 2024

This workshop aimed to explore opportunities to improve racial and ethnic diversity in clinical trials with a focus on system-level change and collective efforts across organizations and sectors that no one entity can effectively take on alone.

[Workshop videos and presentations](#)

[Proceedings](#)

Biological Effectors of Social Determinants of Health in Cancer: Identification and Mitigation

March 20-21, 2024

Biological effectors of social determinants of health (SDOH) interact and impact cancer risk, treatment outcomes, and health equity. This workshop considered opportunities to advance health equity in cancer by identifying promising avenues for future research, as well as policies and interventions aimed at mitigating the negative impacts of the SDOH in cancer.

[Workshop videos and presentations](#)

[Proceedings](#)

Optimizing Public-Private Partnerships for Clinical Cancer Research

Collaborative workshop convened by:

National Cancer Policy Forum
Forum on Drug Discovery, Development, and Translation

October 17-18, 2023

Public-private partnerships (PPPs) have the potential to more effectively leverage public funding and resources, increase the breadth and depth of research, and affect a more rapid translation from basic discoveries to public health applications. Industry, government, nonprofit, and academic organizations could each make important and unique contributions to this endeavor. This workshop examined opportunities to enhance and foster PPPs for clinical cancer research and considered lessons learned from examples of public-private collaborations in oncology or other fields that have helped to advance clinical research and improve patient outcomes.

[Workshop videos and presentations](#)

[Proceedings](#)

Assessing and Advancing Progress in the Delivery of High-Quality Cancer Care

Collaborative workshop co-hosted by:

National Cancer Policy Forum
American Society of Clinical Oncology

October 5-6, 2023

2023 marked the 10-year anniversary of the Institute of Medicine report *Delivering High-Quality Cancer Care: Charting a New Course for a System in Crisis* and the ability of the cancer care delivery system to provide high-quality cancer care to all patients remains elusive. This workshop provided an opportunity for the cancer care community to discuss persistent barriers to achieving excellent and equitable cancer care for all and additional actions that could be taken to implement the 2013 recommendations. Workshop presentations and discussions also identified aspects of cancer care that have changed over the past decade and where new strategies are needed to improve the quality of care.

[Workshop videos and presentations](#)

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NATIONAL CANCER POLICY FORUM

WORKSHOP PROCEEDINGS AND RELATED PUBLICATIONS

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Proceedings of a Workshop

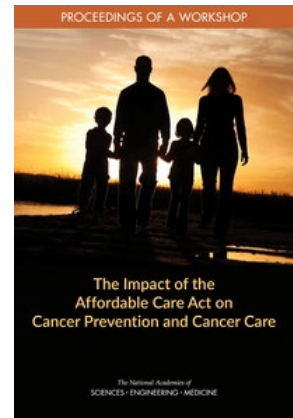
PROCEEDINGS OF A WORKSHOP

Innovation in Cancer Care and Cancer Research in the Context of the COVID-19 Pandemic



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PROCEEDINGS OF A WORKSHOP



The Impact of the Affordable Care Act on Cancer Prevention and Cancer Care

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WORKSHOP PROCEEDINGS

2025

Addressing the Impact of Tobacco and Alcohol Use on Cancer-Related Health Outcomes (In progress)
Opportunities and Challenges for the Development and Adoption of Multicancer Detection Tests
Exploring Clinical Guidelines for the Adoption of Genomic Testing
Enabling 21st Century Applications for Cancer Surveillance through Enhanced Registries and Beyond

2024

Toward a Framework to Improve Diversity and Inclusion in Clinical Trials
Biological Effectors of Social Determinants of Health in Cancer: Identification and Mitigation
Optimizing Public-Private Partnerships for Clinical Cancer Research
Assessing and Advancing Progress in the Delivery of High-Quality Cancer Care
Developing a Multidisciplinary and Multispecialty Workforce for Patients with Cancer, from
Diagnosis to Survivorship
Incorporating Integrated Diagnostics into Precision Oncology Care: Proceedings of a Workshop
Addressing Treatment Resistance in the Development of Cancer Immune Modulator Therapeutics:
Proceedings of a Workshop

2023

The Potential Contribution of Cancer Genomics Information to Community Investigations of
Unusual Patterns of Cancer: Proceedings of a Workshop
Advancing Progress in Cancer Prevention and Risk Reduction: Proceedings of a Workshop
Realizing the Potential of Genomics across the Continuum of Precision Health Care:
Proceedings of a Workshop

2022

Family Caregiving for People with Cancer and Other Serious Illnesses: A Workshop
Innovation in Electronic Health Records for Cancer Care, Research, and Surveillance: A Workshop
Promoting Health Equity in Cancer Care: Proceedings of a Workshop
The Role of Companion Animals as Sentinels for Predicting Environmental Exposure Effects on Aging and
Cancer Susceptibility in Humans: Proceedings of a Workshop
Innovation in Cancer Care and Cancer Research in the Context of the COVID-19 Pandemic:
Proceedings of a Workshop
Impact of the Affordable Care Act on Cancer Prevention and Cancer Care: Proceedings of a Workshop

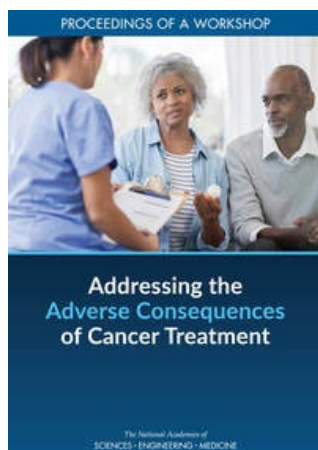
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WORKSHOP PROCEEDINGS

2021

- Addressing the Adverse Consequences of Cancer Treatment: Proceedings of a Workshop
- Opportunities and Challenges for Using Digital Health Applications in Oncology: Proceedings of a Workshop
- Improving the Evidence Base for Treatment Decision Making for Older Adults with Cancer: Proceedings of a Workshop— in Brief
- Advancing Progress in the Development and Implementation of Effective, High-Quality Cancer Screening: Proceedings of a Workshop
- Drug Research and Development for Adults Across the Older Age Span: Proceedings of a Workshop

2020

- Reflections on Sharing Clinical Trial Data: Challenges and a Way Forward: Proceedings of a Workshop
- Applying Big Data to Address the Social Determinants of Health in Oncology: Proceedings of a Workshop
- Health Literacy and Communication Strategies in Oncology: Proceedings of a Workshop
- Enhancing Scientific Reproducibility in Biomedical Research Through Transparent Reporting: Proceedings of a Workshop

2019

- Developing and Sustaining an Effective and Resilient Oncology Careforce: Proceedings of a Workshop
- Advancing Progress in the Development of Combination Cancer Therapies with Immune Checkpoint Inhibitors: Proceedings of a Workshop
- Improving Cancer Diagnosis and Care: Clinical Application of Computational Methods in Precision Oncology: Proceedings of a Workshop

2018

- Improving Cancer Diagnosis and Care: Patient Access to Oncologic Imaging and Pathology Expertise and Technologies: Proceedings of a Workshop
- Establishing Effective Patient Navigation Programs in Oncology: Proceedings of a Workshop
- Long-Term Survivorship Care After Cancer Treatment: Proceedings of a Workshop

2017

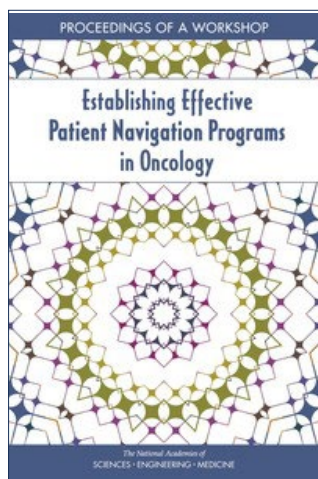
- The Drug Development Paradigm in Oncology: Proceedings of a Workshop
- Cancer Care in Low-Resource Areas: Cancer Treatment, Palliative Care, and Survivorship Care: Proceedings of a Workshop
- Implementation of Lung Cancer Screening: Proceedings of a Workshop
- Incorporating Weight Management and Physical Activity Throughout the Cancer Care Continuum: Proceedings of a Workshop

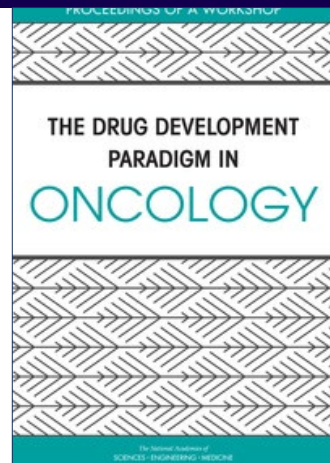
2016

- Policy Issues in the Clinical Development and Use of Immunotherapy for Cancer Treatment: Proceedings of a Workshop
- Cancer Care in Low-Resource Areas: Cancer Prevention and Early Detection: Workshop Summary
- Appropriate Use of Advanced Technologies for Radiation Therapy and Surgery in Oncology: Workshop Summary

2015

- Comprehensive Cancer Care for Children and Their Families: Summary of a Joint Workshop by the Institute of Medicine and the American Cancer Society
- Policy Issues in the Development and Adoption of Biomarkers for Molecularly Targeted Cancer Therapies: Workshop Summary
- Assessing and Improving the Interpretation of Breast Images: Workshop Summary
- Role of Clinical Studies for Pets with Naturally Occurring Tumors in Translational Cancer Research: Workshop Summary





WORKSHOP PROCEEDINGS

2014

Ensuring Patient Access to Affordable Cancer Drugs: Workshop Summary
Contemporary Issues for Protecting Patients in Cancer Research: Workshop Summary

2013

Identifying and Addressing the Needs of Adolescents and Young Adults with Cancer: Workshop Summary
Implementing a National Cancer Clinical Trials System for the 21st Century: Second Workshop Summary
Sharing Clinical Research Data: Workshop Summary
Delivering Affordable Cancer Care in the 21st Century: Workshop Summary
Reducing Tobacco-Related Cancer Incidence and Mortality: Workshop Summary

2012

The Role of Obesity in Cancer Survival and Recurrence: Workshop Summary
Informatics Needs and Challenges in Cancer Research: Workshop Summary
Facilitating Collaborations to Develop Combination Investigational Cancer Therapies: Workshop Summary

2011

Implementing a National Cancer Clinical Trials System for the 21st Century: Workshop Summary
Patient-Centered Cancer Treatment Planning: Improving the Quality of Oncology Care: Workshop Summary
The National Cancer Policy Summit: Opportunities and Challenges in Cancer Research and Care
Nanotechnology and Oncology: Workshop Summary

2010

Direct-to-Consumer Genetic Testing (with the National Research Council): Summary of a Workshop
Extending the Spectrum of Precompetitive Collaboration in Oncology Research: Workshop Summary
A Foundation for Evidence-Driven Practice: A Rapid Learning System for Cancer Care: Workshop Summary
Policy Issues in the Development of Personalized Medicine in Oncology: Workshop Summary

2009

Assessing and Improving Value in Cancer Care: Workshop Summary
Ensuring Quality Cancer Care Through the Oncology Workforce: Sustaining Care in the 21st Century: Workshop Summary
Multi-Center Phase III Clinical Trials and the NCI Cooperative Group Program: Workshop Summary

2008

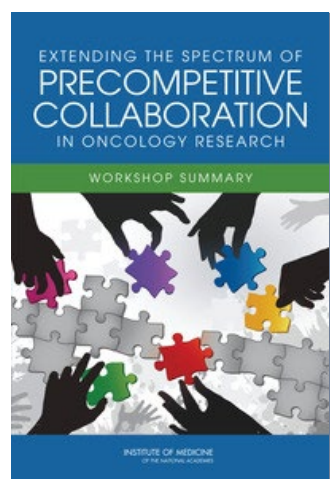
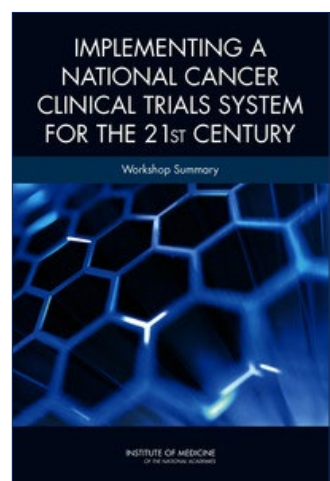
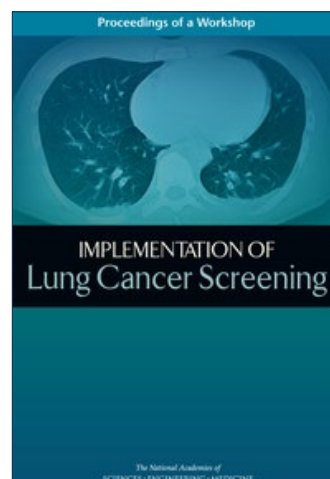
Implementing Colorectal Cancer Screening: Workshop Summary
Improving the Quality of Cancer Clinical Trials: Workshop Summary

2007

Cancer-Related Genetic Testing and Counseling: Workshop Proceedings
Cancer in Elderly People: Workshop Proceedings
Implementing Cancer Survivorship Care Planning: Workshop Summary

2006

Effect of the HIPAA Privacy Rule on Health Research: Proceedings of a Workshop
Developing Biomarker-Based Tools for Cancer Screening, Diagnosis, and Treatment: Workshop Summary



RELATED WORK

CONSENSUS STUDY REPORTS BUILDING ON NCPF WORK

Childhood Cancer and Functional Impacts Across the Care Continuum (2021)

Report: nap.edu/catalog/25944

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Guiding Cancer Control:
A Path to Transformation (2019)

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Making Medicines Affordable:
A National Imperative (2017)

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Biomarker Tests for Molecularly Targeted Therapies:
Key to Unlocking Precision Medicine (2016)

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Ovarian Cancers: Evolving Paradigms in Research and Care (2016)

Report: nap.edu/catalog/21841

Delivering High-Quality Cancer Care: Charting a New Course for a System in Crisis (2013)

Report: nap.edu/catalog/18359

Evolution of Translational Omics: Lessons Learned and the Path Forward (2012)

Report: nap.edu/catalog/13297

A National Cancer Clinical Trials System for the 21st Century: Reinvigorating the NCI Cooperative Group Program (2010)

Report: nap.edu/catalog/12879

Evaluation of Biomarkers and Surrogate Endpoints in Chronic Disease (2010)

Report: nap.edu/catalog/12869

Beyond the HIPAA Privacy Rule: Enhancing Privacy, Improving Health Through Research (2009)

Report: nap.edu/catalog/12458

Cancer Biomarkers: The Promises and Challenges of Improving Detection and Treatment (2007)

Report: nap.edu/read/11892

INDIVIDUALLY AUTHORED PUBLICATIONS BUILDING ON NCPF WORK

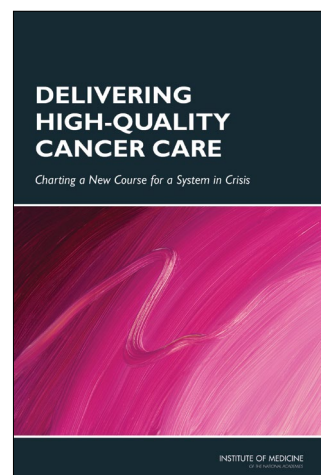
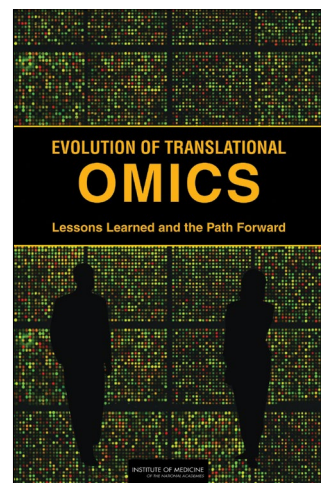
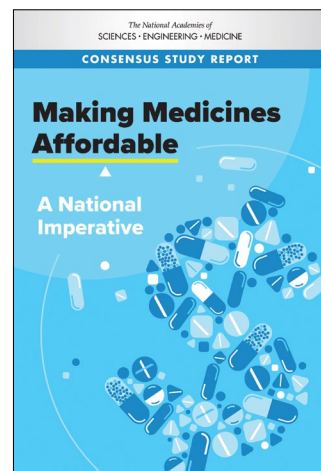
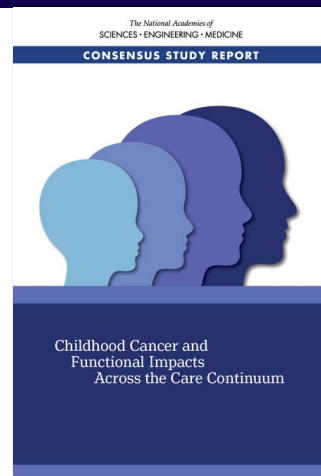
Independent, individually authored articles arising from NCPF workshops—and consensus studies building on NCPF work—include:

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Board on Mathematical Sciences and Analytics (BMSA)

OUR WORK

The National Academies' Board on Mathematical Sciences and Analytics (BMSA) provides actionable advice to policy makers on important issues related to math, statistics, data science, and advanced technologies from artificial intelligence to digital twins.

Consensus Studies

- [Frontiers of Statistics in Science and Engineering](#)
This ongoing study is a forward-looking assessment of the current state of the statistical sciences and emerging opportunities for the discipline and its stakeholders as they look to 2035 and beyond. The study explores statistical research, statistical needs to support scientific and technological advances, strength of interdisciplinary collaborations, and education and workforce development.
- [Foundational Research Gaps and Future Directions for Digital Twins](#)
The report, sponsored by NSF, DoD, DOE, and NIH, considers the potential of digital twins to transform scientific research, industrial practices, and many aspects of daily life. It provides much-needed clarity for researchers and funding agencies by defining what is (and isn't) a digital twin and identifies the foundational research and resources needed to support their development. The study has sparked new collaborations in this field among sponsoring agencies, including a program solicitation issued jointly by NSF and AFOSR.
- [Illustrating the Impact of the Mathematical Sciences](#)
This project showcases, through a series of beautiful infographics and short articles, how advances in the mathematical sciences profoundly impact our daily lives and pave the way for critical technology advances, from advanced manufacturing to cybersecurity. Available in both digital and poster form, the infographics are serving as a resource for math educators and students.

Workshops and Webinars

- [AI to Assist Mathematical Reasoning Workshop and Webinars](#)
This workshop and follow-on webinar series explored how AI technologies are being used to advance the mathematical sciences. The event brought together academic, industry, and government stakeholders to discuss emerging research opportunities and ways to collaborate among interdisciplinary research communities.
- [Statistical and Data-Driven Methods for Additive Manufacturing Qualification](#)
This workshop explored ways to use statistical methods and next-generation data-driven models to enhance the additive manufacturing processes. Workshop discussions focused on future directions in statistics, data analytics, and artificial intelligence, with the goal of laying the foundation for streamlined qualification of additively manufactured parts.

Standing Committees

- [Committee on Applied and Theoretical Statistics \(CATS\)](#)
CATS connects innovation in statistics and analytics research, training, and practice to issues of national and global importance.

Work with Us

If you are interested in working with us, please contact Dr. Michelle Schwalbe at mschwalbe@nas.edu for more information. Visit our website at nationalacademies.org/bmsa to view our current activities and sign up for email updates.



About the Board on Life Sciences

Vision

Facilitate the development and use of evidence and experience in the life sciences and biotechnology to inform decision-making for the betterment of society and the environment.

Mission

Work with a variety of U.S. and international experts toward advancing transdisciplinary life sciences and biotechnology research and development and addressing critical and emerging technical, policy, and societal issues associated with the life sciences and biotechnology research and their applications.

Objectives

- Provides evidence and experience-informed advice to increase scientific knowledge through various approaches (e.g., hypothesis-driven, data-driven, use-inspired design and development, observation) and translation of this knowledge to action.
- Navigates the need for authoritative knowledge, curated data for analyses, and adaptation and flexibility to use technologies and data to advance science and inform policy.
- Evaluates the critical infrastructure, governance landscape, workforce needs, and resources needed to meet current and future needs in life sciences and biotechnology research and development.
- Addresses critical ethical, policy and governance, diplomacy, safety, security, and environmental issues associated with life science and biotechnology research and their applications.
- Includes voices and knowledge in U.S. and international discourse related to research, development, and application of life sciences and biotechnology advances.
- Provides objective analyses about current scientific, societal, and policy landscape and future trends in life sciences and biotechnology research and development for various technical and non-technical audiences.

Strategic Areas

The Board on Life Sciences generally works across the basic, applied, and emerging life sciences and biotechnology research and development spectrum, anticipating and addressing scientific trends, their applications, and their implications to various societal issues. Informed by recent life sciences and biotechnology trends, the Board on Life Sciences has identified **five strategic areas** in which we proactively work:

- ***Adaptive and inclusive life sciences and biotechnology research and development enterprise*** that supports innovation in basic, applied, and emerging life sciences and biotechnology research, in their application to address various needs, and in strategies for assessing and anticipating their broader implications to society.
- ***Transdisciplinary life sciences and biotechnology research and development*** (i.e., bio + X) that transform how living systems are studied and how biological knowledge and materials are used for non-life sciences purposes and for the bio-based economy.
- ***Digital and connected life sciences research enterprises*** that enable data-driven scientific inquiry, computational and cloud-based experimentation and analysis approaches, and computational design and modeling of physical molecules and life sciences systems.
- ***Analysis, prevention, and reduction of 21st century biological risks*** enabled by the transformative advances in the life sciences and biotechnology and by the changing security landscape involving biology.
- ***Foundational life science and biotechnology research and development for health*** that enhance current understanding of complex interconnections among humans, animals, plants, microbes, and the environment, and actions to characterize and reduce detrimental health effects within all living systems.



Stay in Touch

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www.nationalacademies.org/bls/board-on-life-sciences



Upcoming Workshop

Strategies and Interventions to Strengthen Support for Family Caregiving and to Alleviate Caregiver Burden: A Workshop

June 5-6, 2025

Roundtable on Quality Care for People with Serious Illness
National Cancer Policy Forum
Forum on Aging, Disability, and Independence

Keck Center Room 100
500 Fifth Street, NW
Washington, DC 20001

Workshop Background

A National Academies of Sciences, Engineering, and Medicine planning committee will organize a 1.5-day public workshop that will examine evidence-based interventions and strategies that effectively address the physical, mental, and financial burdens of caregiving for cancer and other serious illnesses, with an emphasis on the role of palliative care. The workshop will feature invited presentations and panel discussions to explore the following topics:

- Strategies and interventions to address the range of challenges associated with caregiving: psychological, emotional, physical, and financial/economic burden, including increased risk of suicide among caregivers
- The critical role of palliative care in interventions to ease caregiver burden
- Special needs of different caregiver populations (e.g., children, older adults)
- Ways to scale and spread successful programs and interventions
- Policy opportunities to support family caregivers, including employer/workplace-based policies and programs

The planning committee will develop the agenda for the workshop sessions, select and invite speakers and discussants, and moderate the discussions. A proceedings of the presentations and discussions at the workshop will be prepared by a designated rapporteur in accordance with institutional guidelines.

Planning Committee

Peggy Maguire, Cambia Health Foundation (Chair)
Alison N. Barkoff, Milken Institute School of Public Health George Washington University
Jori F. Bogetz, University of Washington School of Medicine
Rita Choula, AARP Public Policy Institute
Temeika Fairley, Centers for Disease Control and Prevention
Rory Farrand, National Alliance for Care at Home
Jeffrey T. Garland, Association of Professional Chaplains
Sharon B. Hamill, California State University Shiley Haynes Institute for Palliative Care
Rebecca A. Kirch, National Patient Advocate Foundation
Kashelle Lockman, University of Iowa Carver College of Medicine
Jason Resendez, The National Alliance for Caregiving
Susan M. Schneider, Duke University

[Workshop Website](#)

Upcoming Workshop

Innovative Person-Centered Clinical Cancer Research: A Workshop September 29-30, 2025

National Cancer Policy Forum
Forum on Drug Discovery, Development, and Translation

Keck Center Room 100
500 Fifth Street, NW
Washington, DC 20001

Workshop Background

Person-centered clinical research can positively influence the outcomes of clinical research by providing a more accurate representation of real-world patient experiences. It addresses questions that are informed by patient experiences, needs, and perspectives, and involves patients in all stages of research, including design, activation, enrollment, data collection, completion, and outcome reporting. Although patient-reported outcome measures may offer potential benefits for clinical cancer research, challenges in the completeness, reliability, and validity of the data persist. This workshop will examine opportunities to overcome these challenges to advance the conduct of innovative, person-centered clinical cancer research to improve outcomes for all patients. The workshop will feature invited presentations and panel discussions on topics that may include:

- Challenges in enabling clinical cancer research, and opportunities to enhance person-centeredness and innovation in clinical cancer research.
- Strategies to embed person-centered principles across the design and conduct of clinical cancer research, including:
 - prioritization of research questions and outcomes that matter to patients,
 - inclusion of validated quality-of-life endpoints, and
 - patient involvement in the design and conduct of clinical studies, as well as reporting of study results.
- Challenges and opportunities to routinely collect, report, and act on patient-reported outcome measures in clinical cancer research.
- Ways to support the oversight and regulation of novel person-centered clinical research methods.
- Opportunities to expand availability of clinical cancer research to patients, especially in community settings of care.

The planning committee will develop the agenda for the workshop sessions, select and invite speakers and discussants, and moderate the discussions. A proceedings of the presentations and discussions at the workshop will be prepared by a designated rapporteur in accordance with institutional guidelines.

Planning Committee

Gwen Darien, Patient Advocate Foundation (Co-Chair)
Lawrence Shulman, University of Pennsylvania (Co-Chair)
Gideon Blumenthal, Merck
Gail Eckhardt, Baylor College of Medicine
Roy Herbst, Yale University
Randy Jones, University of Virginia
Shivaani Kummar, Oregon Health & Science University
Megan O'Meara, Pfizer Oncology
Larissa Nekhlyudov, Brigham & Women's Hospital, Dana-Farber Cancer Institute,
and Harvard Medical School
Cleo Ryals, Flatiron Health
Richard Schilsky, American Society of Clinical Oncology
Ann Taylor, Comanche Biopharma
Robert Winn, Virginia Commonwealth University

[Workshop Website](#)

Upcoming Workshop

Policy Issues for Integrating Artificial Intelligence in Cancer Research and Care: A Workshop

March 9-10, 2026

National Cancer Policy Forum
Computer Science and Telecommunications Board

Keck Center Room 100
500 Fifth Street, NW
Washington, DC 20001

Workshop Background

A planning committee of the National Academies of Sciences, Engineering, and Medicine will organize and host a 1.5-day public workshop that will examine the current and potential future uses of Artificial Intelligence (AI) in cancer care, and ways to anticipate and address challenges related to integration of these technologies in the care of patients with cancer. With a focus on the responsible and effective use of AI in oncology, the workshop will consider current policy initiatives across healthcare and the unique needs for oncology care. Presentations and discussions at the workshop may include:

- **The current state and future applications of AI in oncology care:** the different types of AI and their application in current care and their future potential (e.g., AI biomarkers, treatment planning and clinical decision support systems, facilitating clinical efficiencies, product discovery, data curation, clinical evidence generation).
- **Existing policies and policy gaps** for rigorous and transparent assessment of data sets, training and validation, clinical validation, safety, and effectiveness of tools; for implementing new tools; and for monitoring use and performance, both for individual AI-based tools and within the global context of health care delivery.
- **Ethical and legal challenges such as** data security and patient privacy, algorithmic bias and drift, liability in AI-driven decisions, implications of autonomous decision-making tools, impact on access to care, transparency in the selection of training data, the models and objective functions used in training the data, code development and tool output, the role of AI in clinical decision-making for patients and clinicians, and intellectual property.
- **Potential future challenges such as** accuracy of AI output in the setting of rapidly changing evidence and clinical practice guidelines, increasing autonomy of AI systems, integration with other advanced technologies (e.g., genomics), and the need for adaptable policies that can evolve with rapid technological changes.
- **Ways to engage key participants** in dialogue and policy formulation, including patients, AI developers, healthcare providers, ethicists, legal experts, and industry leaders.
- **Data governance** for responsible use of patient data in AI systems, such as data anonymization, patient consent, data sharing practices, and accountability for data misuse.
- **Educational and training initiatives** on AI literacy to support effective utilization and interpretation of AI-generated insights by healthcare professionals, and to help patients understand how AI might influence their care.

The planning committee will develop the agenda for the workshop sessions, select and invite speakers and discussants, and moderate the discussions. A proceedings of the presentations and discussions at the workshop will be prepared by a designated rapporteur in accordance with institutional guidelines.

Planning Committee Pending

Workshop Website Pending

Preventing Discrimination, Harassment, and Bullying: Policy for Participants in National Academies Activities

Purpose

To prohibit discrimination, harassment, and bullying for all participants in National Academies activities.

Applicability

All participants in all settings and locations in which the National Academies work and activities are conducted.

Preventing Discrimination, Harassment, and Bullying: Policy for Participants in National Academies Activities

The National Academies of Sciences, Engineering, and Medicine (National Academies) are committed to the principles of integrity, civility, and respect in all of our activities. We look to you to be a partner in this commitment by helping us to maintain a professional and cordial environment. **All forms of discrimination, harassment, and bullying are prohibited in any National Academies activity.** This policy applies to all participants in all settings and locations in which the National Academies work and activities are conducted, including committee meetings, workshops, conferences, and other work and social functions where employees, volunteers, sponsors, vendors, or guests are present.

Definitions

Discrimination is prejudicial treatment of individuals or groups of people based on their race, ethnicity, color, national origin, sex, sexual orientation, gender identity, age, religion, disability, veteran status, or any other characteristic protected by applicable laws.

Sexual harassment is unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature that creates an intimidating, hostile, or offensive environment.

Other types of harassment include any verbal or physical conduct directed at individuals or groups of people because of their race, ethnicity, color, national origin, sex, sexual orientation, gender identity, age, religion, disability, veteran status, or any other characteristic protected by applicable laws, that creates an intimidating, hostile, or offensive environment.

Bullying is unwelcome, aggressive behavior involving the use of influence, threat, intimidation, or coercion to dominate others in the professional environment.

Reporting and Resolution

Any violation of this policy should be reported. If you experience or witness discrimination, harassment, or bullying, you are encouraged to make your unease or disapproval known to the individual at the time the incident occurs, if you are comfortable doing so. You are also urged to report any incident by:

- Filing a complaint through the National Academies Complaint Intake Form (<https://nas.hracity.net/webform/index/a5ed0226-f5e5-4da4-be0d-1daf8976f594>), and/or
- Filing a complaint with the Office of Human Resources at 202-334-3400 or hrservicecenter@nas.edu, or
- Reporting the incident to an employee involved in the activity in which the member or volunteer is participating, who will then file a complaint with the Office of Human Resources.

Complaints should be filed as soon as possible after an incident. To ensure the prompt and thorough investigation of the complaint, the complainant should provide as much information as is possible, such as names, dates, locations, and steps taken. The Office of Human Resources will investigate the alleged violation in consultation with the Office of the General Counsel.

If an investigation results in a finding that an individual has committed a violation, the National Academies will take the actions necessary to protect those involved in its activities from any future discrimination, harassment, or bullying, including in appropriate circumstances **the removal of an individual from current National Academies activities and a ban on participation in future activities.**

Confidentiality

Information contained in a complaint is kept confidential, and information is revealed only on a need-to-know basis. The National Academies will not retaliate or tolerate retaliation against anyone who makes a good faith report of discrimination, harassment, or bullying.

Responsible Party

The NRC Executive Officer is responsible for oversight of and substantive changes to the policy.