

WELCOME

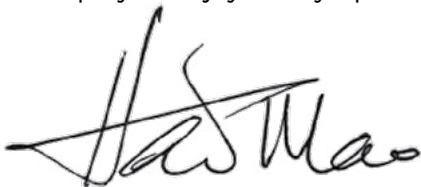
Welcome to the 19th Nano-Bio Symposium, hosted by the Johns Hopkins Institute for NanoBioTechnology. This year's theme, Engineering the Future of Life and Health: 20 Years of Discovery, Innovation, and Technology, marks a special milestone as we celebrate two decades of groundbreaking research, interdisciplinary collaboration, and transformative impact at the INBT. Our celebration also coincides with the 150th anniversary of Johns Hopkins University. Since its founding in 1876, the university has pursued a simple but powerful mission: knowledge for the world. The INBT is proud to carry that tradition forward.

Since 2006, the INBT has served as a hub for bold ideas at the intersection of engineering, medicine, and the life sciences. What began as an ambitious vision has grown into a thriving community of researchers, trainees, and alumni advancing the frontiers of biotechnology. Today, we celebrate not only the science but also the people: the founding leaders, faculty, staff, students, and postdoctoral fellows who have made the INBT what it is.

This symposium brings together distinguished alumni who are now leaders in academia, industry, government, and venture capital, alongside current researchers shaping the future of our five research pillars: aging, cancer, sensing, genome engineering, and cell programming. Sessions will showcase advances and future directions that define the next era of convergent bioengineering. We will hear a special reflection on the INBT's journey from founding director Peter Searson and first administrative manager Sue Porterfield. Our morning keynote welcomes back former INBT director Sharon Gerecht, now chair of biomedical engineering at Duke University, whose return exemplifies the enduring connections that define our community. Our afternoon keynote features Sadik Kassim of the Danaher Corporation, who will share how Danaher collaborated with Children's Hospital of Philadelphia, the University of Pennsylvania, and others to deliver the first personalized CRISPR based gene editing therapy.

We graciously thank our attendees, speakers, panelists, judges, and poster competitors, and are deeply grateful to the INBT's outstanding staff for their planning and execution of today's celebration.

We hope you enjoy the symposium. We would love to hear your feedback.



Hai-Quan Mao, PhD
Director



Sashank Reddy, MD, PhD
Associate Director

19TH NANO-BIO SYMPOSIUM: ENGINEERING THE FUTURE OF LIFE AND HEALTH—

20 YEARS OF DISCOVERY, INNOVATION, AND TECHNOLOGY



Scan the QR code for agenda details, campus maps, and a digitally accessible program

MONDAY, MAY 4, 8:15 A.M. TO 7:30 P.M.

BLOOMBERG STUDENT CENTER, HOMEWOOD CAMPUS
JOHNS HOPKINS UNIVERSITY

8:15 TO 9 A.M.

Registration Check In and Breakfast
Theater 105

9 TO 9:10 A.M.

Welcome and Opening Remarks
Theater 105

9:10 TO 9:55 A.M.

Morning Keynote Talk: Sharon Gerecht, PhD
Theater 105

10 TO 11 A.M.

**Distinguished Alumni Panel Discussion,
Academic Track**
Theater 105

11 TO 11:10 A.M.

Break

11:10 A.M. TO 11:30 P.M.

**From Idea to Impact:
The INBT's 20-Year Journey**
Theater 105

11:35 TO 11:55 A.M.

Rapid-Fire Presentations
Theater 105

NOON TO 12:45 P.M.

Lunch + Networking
MPR 404

12:45 TO 1:30 P.M.

Afternoon Keynote Talk: Sadik Kassim, PhD
Theater 105

1:35 TO 2:35 P.M.

**Distinguished Alumni Panel Discussion,
Non-Academic Track**
Theater 105

2:35 TO 2:45 P.M.

Break

2:45 TO 4:10 P.M.

Research Pillars Spotlight Panel
Theater 105

4:15 TO 5:45 P.M.

Poster Competition
Poster Session A: 4:15 to 5 p.m.
Poster Session B: 5 to 5:45 p.m.
MPR 210

5:45 TO 6 P.M.

Award Presentation and Closing Remarks
MPR 210

6 TO 7:30 P.M.

20th Anniversary Celebration
MPR 404

150 YEARS ONE HOPKINS

Visit [150.JHU.EDU](https://150.jhu.edu) to read stories of impact, learn about our commitment to research, and see how you can **join the celebration!**



JOHNS HOPKINS

JH150 YEARS

CHEERS TO 20 YEARS: THE INBT CELEBRATES TWO DECADES OF DISCOVERY, INNOVATION, AND TECHNOLOGY

As the Johns Hopkins Institute for NanoBioTechnology marks its 20th anniversary, we reflect on two decades of pioneering research to address global health challenges to improve health and well-being for all. What began as a collaborative effort among engineering, biology, medicine, and public health faculty has matured into a thriving interdisciplinary hub. The institute has consistently leveraged experts across the campus and built partnerships with industry, government, and the private sector to push the boundaries of nanobiotechnology and foster research that moves ideas from the lab bench to patients.

Founding leaders Peter Searson, the Joseph R. and Lynn C. Reynolds Professor of Engineering and professor of materials science and engineering, and Denis Wirtz, Theophilus Halley Smoot Professor and professor of chemical and

biomolecular engineering, centered the institute's mission to advance medicine by developing novel diagnostics and therapies grounded in molecular-level science. This foundation included four main research areas: imaging and diagnostics, nanoscale therapeutics, tools for probing cellular and molecular dynamics, and investigations into the public health implications of nanotechnology. Additionally, to facilitate the collaboration efforts across disciplines, the institute provided lab facilities, research coordination, seed funding, and dedicated support staff to help faculty researchers.

Searson and Wirtz also established a translational, multidisciplinary research infrastructure, which grew the institute's reputation for connecting faculty with their counterparts in industry to bring emerging technologies to market. That early leadership

set the tone for moving discoveries toward practical use and strengthened ties with other research entities like Johns Hopkins Technology Ventures. Those efforts have resulted in discoveries with commercial applications like patents, licensing opportunities, and faculty-, student-, and alumni-led startups.

In 2017, Searson and Wirtz passed leadership to Sharon Gerech, former professor of chemical and biomolecular engineering and current chair of biomedical engineering at Duke University, with Hai-Quan Mao, professor of materials science and engineering, as associate director. Mao became director in 2021 and brought Sashank Reddy, associate professor of plastic and reconstructive surgery, on as his associate director. This leadership succession has preserved the institute's research, translation, and education ethos while redefining and positioning it for the future.



The INBT's official launch event on May 15, 2006. Many attendees helped secure early funding and critical support to launch the institute, including Sen. Barbara Mikulski of Maryland. From left: Michael Klag, Ted Poehler, Denis Wirtz, Barbara Mikulski, Peter Searson, Peter Devreotes, Nicholas P. Jones, Jonathan Links, and Martin Pomper.

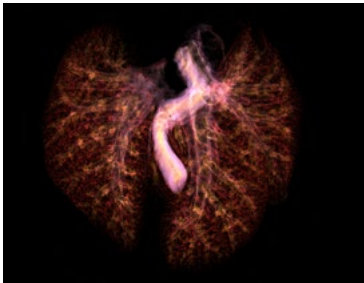
Together, Mao and Reddy established five new research pillars that build on the institute's longstanding expertise and strengths to equip it for continued success over the next two decades and beyond. These areas include aging, cancer, sensing, cell programming, and genome engineering. These new pillars reflect the INBT's commitment to advancing interdisciplinary solutions at the intersection of engineering, nanotechnology, biology, medicine, and artificial intelligence. By integrating AI and machine learning tools into research,

Mao and Reddy aim to accelerate discoveries and develop next-generation biomedical technologies with clinical and societal impact.

To support past and current research ambitions, the INBT has attracted and sustained funding for specialized centers over its history—such as the Engineering in Oncology Center (2009-2014), the Physical Sciences–Oncology Center (2009-2019), and the Center of Nanotechnology Excellence (2010-2015)—and recently launched centers that expand technical reach and

translational power. The Center for 3D Multiscale Imaging (2022) introduced CODA, a computational program that reconstructs and analyzes healthy and diseased tissue architecture at unprecedented scale, and the RNA Innovation Center (2024), which provides mRNA design and production resources that speed preclinical studies and partnerships with industry and academia.

The institute's advocacy and outreach efforts have also marked its two-decade journey. Among the first advocate for



CODA, a groundbreaking computational program co-developed by Denis Wirtz, Pei-Hsun Wu, and Ashley Kiemen, turns hundreds of ultrathin tissue slides into high-resolution 3D models to view healthy and diseased anatomical structures at the single-cell level.

the INBT was Edward Miller, then Dean and Chief Executive Officer of the Johns Hopkins School of Medicine. In 2006, he testified to the House of Representatives Committee on Energy and Commerce for continued federal research support, specifically identifying the INBT as an example of an organization breaking research silos and encouraging interdisciplinary collaboration. The INBT's leadership and faculty have also engaged policymakers and the public to emphasize the value of federal research support and interdisciplinary collaboration—participating

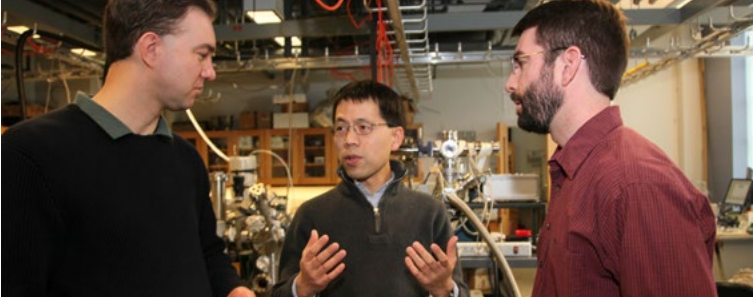
in events such as the USA Science & Engineering Festival and Hopkins on the Hill. They have met directly with congressional and administration officials throughout the years to demonstrate how investments in academic research advances health outcomes and economic opportunity.

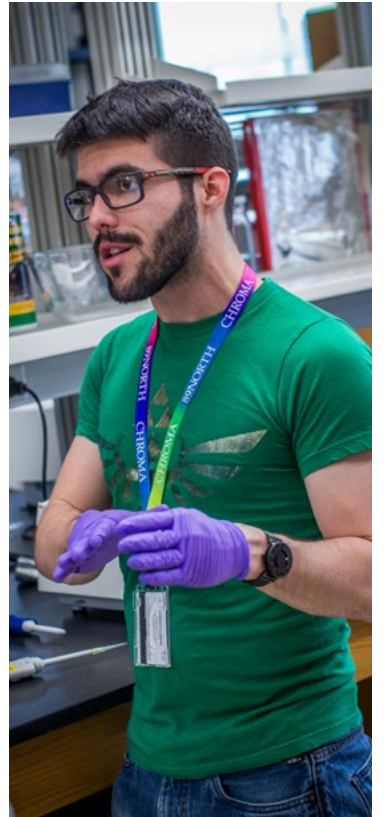
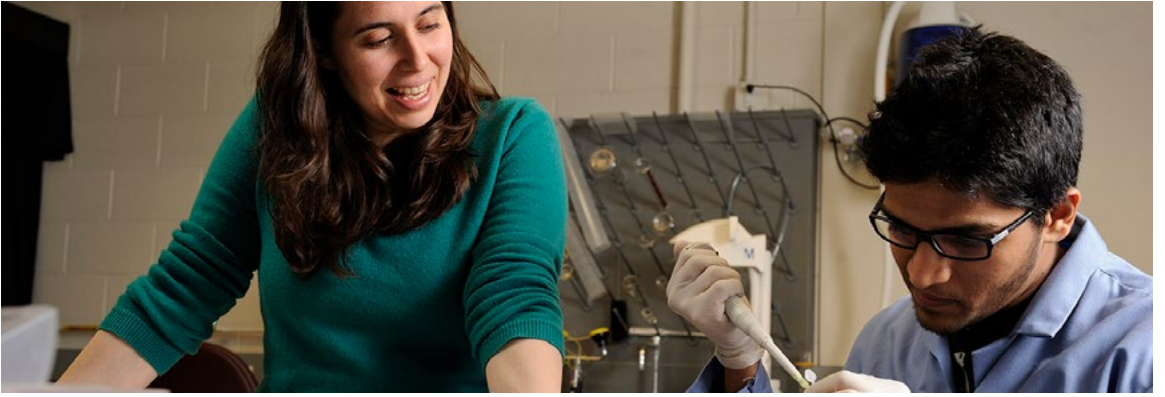
Education has remained central to the INBT's mission to train the next generation of scientists and engineers through a broad range of education programs, courses, and experiential opportunities. Federal funding has supported research training through several programs: the Integrative Graduate Education and Research Traineeship Program (IGERT), T32 predoctoral training programs, International Research Experience for Students (IRES), and the Research Experience for Undergraduates (REU) program that has been running since 2008 and trained more than 200 undergraduates across the United States and its territories. Conceived by then Director of Corporate Partnerships, Tom Fekete,

the Masters Cooperative Education Program was launched in 2016 to provide masters of engineering students a chance to earn their degree while also receiving hands-on training for six months with an industry partner company and a stipend. These initiatives have prepared students for diverse careers and produced alumni recognized at TED talks, Siebel Scholars, the National Science Foundation's Graduate Research Fellows, Forbes 30 Under 30, and Schmidt Science Fellows.

As we celebrate this milestone, we honor the people, partnerships, and persistence that built the INBT and drove its evolution. Looking ahead, the Institute will continue to turn bold ideas into practical solutions, deepen ties with current and new collaborators, and train the next generation of innovators. Here's to the next 20 years of transformational impact through discovery, innovation, and technology.

TWO DECADES OF SCIENCE IN ACTION





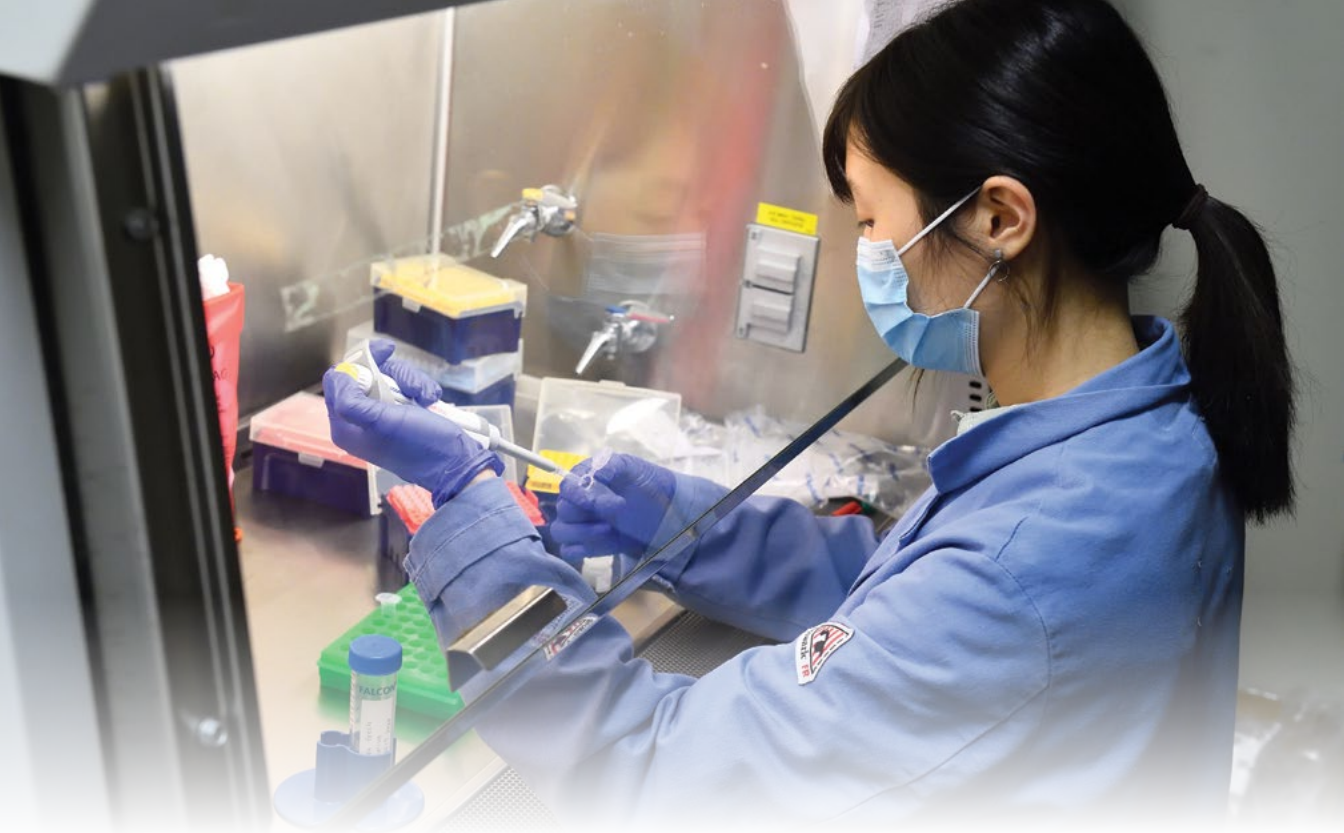
THANK YOU

The yearly Nano-Bio Symposium is the INBT's signature event to showcase and celebrate the latest discoveries from our multidisciplinary researcher teams. It brings together scholars from the Johns Hopkins community, academia, industry, government, and more to network, share knowledge and ideas, and foster new collaborations with the goal of improving health and well-being for all. We thank everyone who made this event a success, including attendees, guest speakers, poster competitors, volunteers, and the INBT staff.

We are also grateful to Johns Hopkins University for their support of this year's event through the Envisioning the Future Award in celebration of the university's 150th anniversary. The Envisioning the Future Award funds academic programming that helps faculty, departments, centers, and institutes convene panel discussions or workshops. These gatherings bring together prominent scholars from Johns Hopkins and elsewhere to reflect on the current state of their disciplines and imagine how Hopkins can help shape their future.

If you would like to support future events or initiatives at the Institute for NanoBioTechnology, please contact us.





EVERY NANOBIT COUNTS!

Your Support Improves Lives

The INBT is dedicated to improving health and well-being for all. Your generosity contributes to this goal by helping us:

- Develop treatments for cancer and other diseases.
- Repair the body using regenerative engineering.
- Create and improve medical devices to detect diseases early.
- Identify key factors of age-associated illnesses.
- Accelerate the translation of research to the market.
- Support education and outreach programs.

Learn how you can help at inbt.jhu.edu/donate





Knowledge. For the world.

Launched on May 15, 2006, the Johns Hopkins Institute for NanoBioTechnology (INBT) aims to solve complex challenges in health care and the environment through tiny science and diverse partnerships at the interface of nanoscience, engineering, biology, and medicine. By removing research silos and fostering cooperative spaces, the INBT enables scientists, clinicians, industry professionals, and others to collaborate and advance areas like aging, cell sensing and programming, diagnostic tools, cancer and other disease therapies, stem cell and regenerative engineering, and process engineering. These multidisciplinary teams from academia and the public, private, and government sectors integrate research, education, and technology transfer to create new knowledge and innovative technologies.



JOHNS HOPKINS
INSTITUTE *for*
NANOBIOTECHNOLOGY