

Nanotechnology offers the capability to unlock new avenues in the early diagnosis and treatment of cancer. To capitalize on this potential, the National Cancer Institute (NCI) launched the NCI Alliance for Nanotechnology in Cancer. Alliance research has led to the development of novel nanomaterials and highly sensitive, multiplexed devices, which are being used to address problems of contemporary oncology.

NCI ALLIANCE FOR NANOTECHNOLOGY IN CANCER

Launched in 2004, the NCI Alliance for Nanotechnology in Cancer (Alliance) program is a comprehensive, systematized effort encompassing the public and private sectors in multidisciplinary research designed to advance basic scientific discoveries and translate them into viable clinical applications.

ACCOMPLISHMENTS (2005-2010)

Since its inception, the Alliance has made important advances through its multidisciplinary collaborative efforts that have led to the development of point-of-care diagnostics and multifunctional agents for imaging and therapy. Some of these achievements include:

Building the community

- Established effective multidisciplinary teams around scientific focus areas of the program
- Established and operated the Nanotechnology Characterization Laboratory (NCL) as a major hub for nanomaterials characterization
- Developed forward strategies and identified needs of the field for the next 5-10 years

Developing robust science

- Published over 1300 peer-reviewed journal papers
- Demonstrated the success of joint intra-Alliance projects through the growing number of publications involving multiple investigators

Translating discoveries into the clinical environment

- Formed over 40 companies associated with the program in the areas of nanotechnology-based diagnostics and therapeutics

- Developed a strong intellectual property portfolio with over 200 disclosures and patents filed by Alliance researchers
- Launched several clinical trials associated with Alliance projects

Leveraging NCI funding

- Received numerous additional grants from peer-reviewed government sources, philanthropy, industry and venture investors

FUTURE GOALS (2010-2015)

The next five years of the program aim to:

- Rapidly advance new nanotechnology discoveries and accelerate their transformation into cancer-relevant applications in clinical practice
- Aid nanoparticle characterization and standardization of characterization methods to enable technology transfer from university laboratories to companies that bring these technologies to patients
- Train the next generation of cancer researchers in the area of nanotechnology

The Alliance focuses on the development and translation of nanotechnology-based techniques and tools for:

- Early disease diagnosis using *in vitro* assays and devices and *in vivo* imaging techniques
- Multifunctional therapeutic solutions
- Techniques for cancer prevention and control

ALLIANCE INFRASTRUCTURE

The innovative research supported by the Alliance is conducted by a network of investigators from diverse institutions and organizations. Currently, the NCI supports a constellation of:

- Nine **Centers of Cancer Nanotechnology Excellence** (CCNEs), which are multidisciplinary centers focused on discovery and tool development of nanotechnology in clinical oncology
- Twelve **Cancer Nanotechnology Platform Partnerships** (CNPPs) that are designed to support individual research projects that will address major barriers and fundamental questions in cancer using innovative nanotechnology solutions
- Six **Cancer Nanotechnology Training Centers** (CNTCs) with the goal of educating and training researchers from diverse fields in the use of nanotechnology-based approaches to advance the understanding of cancer biology and create new methods and tools for the prevention, diagnosis and treatment of cancer
- Seven **Pathway to Independence Awards in Cancer Nanotechnology Research** that will assist the transition of post-doctoral scientists working on cancer nanotechnology from mentored environments to independence
- The **Nanotechnology Characterization Laboratory** (NCL), which performs and standardizes the preclinical characterization of nanomaterials intended for cancer therapeutics and diagnostics developed by researchers from academia, government and industry

DATA SHARING

To address the challenges of data sharing, the Alliance has created the cancer Nanotechnology Laboratory Portal (caNanoLab), which is a web-based portal designed to facilitate data sharing across the Alliance and among the greater research community to expedite and validate the use of nanoparticles in biomedicine.

FUNDING OPPORTUNITIES

To learn more about research funding opportunities relevant to nanotechnology and cancer, please visit our website:

<http://nano.cancer.gov/collaborate/funding/>

FOR MORE INFORMATION:

U.S. Department of Health and Human Services
National Institutes of Health
National Cancer Institute
Center for Strategic Scientific Initiatives

ATTN: NCI Office of Cancer Nanotechnology Research (OCNR)

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Centers of Cancer Nanotechnology Excellence

- California Institute of Technology
- Dartmouth College
- Johns Hopkins University
- MIT and Harvard University
- Northeastern University
- Northwestern University
- Stanford University
- The University of Texas Health Science Center
- University of North Carolina

Cancer Nanotechnology Platform Partnerships

- Cedars-Sinai Medical Center
- Children's Hospital Los Angeles
- Emory University (2 Platforms)
- Northeastern University
- Northwestern University
- Rice University
- University of Cincinnati
- University of Nebraska Medical Center
- University of New Mexico
- University of North Carolina
- University of Utah

Cancer Nanotechnology Training Centers

- Boston University
- Johns Hopkins University
- University of California, San Diego
- University of Illinois Urbana-Champaign
- University of Kentucky
- University of New Mexico

Pathway to Independence Awards in Cancer Nanotechnology Research

- Duke University
- Emory University (2 Awards)
- Massachusetts General Hospital
- National Institute of Biomedical Imaging and Bioengineering
- University of California, San Diego
- Wake Forest University Health Sciences

