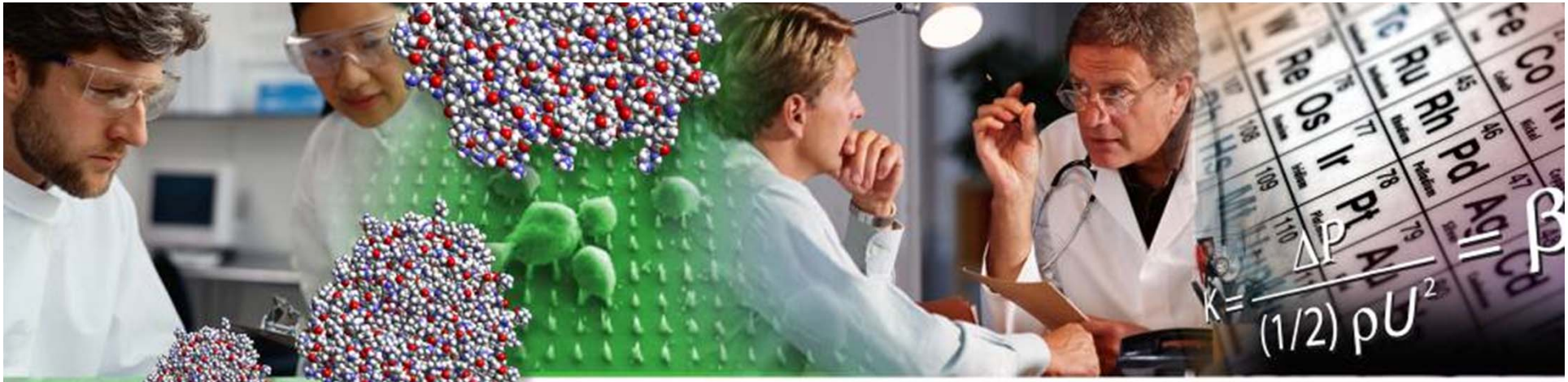


NCI Alliance for Nanotechnology in Cancer: Research Advances and Development of Clinical Applications

Anna D. Barker, Ph.D.
Deputy Director, National Cancer Institute

National Cancer Advisory Board Meeting

June 14, 2006

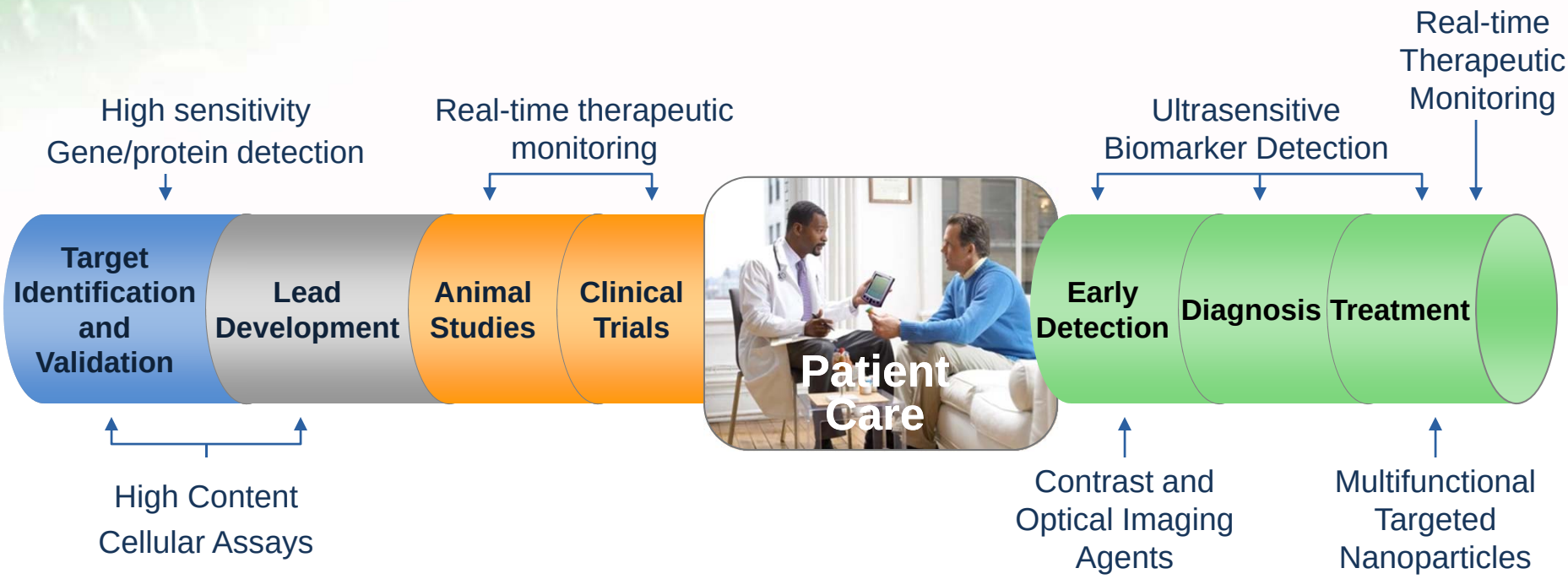
The Potential of Nanotechnology

NCI Alliance for Nanotechnology in Cancer

Nanotechnology has the potential to be the key enabler for the transition of molecular-based science into the clinic, facilitating major advances in the early detection, diagnosis, and treatment of cancer.

Detection, Treatment, Prevention: Nanotech from Bench to Bedside

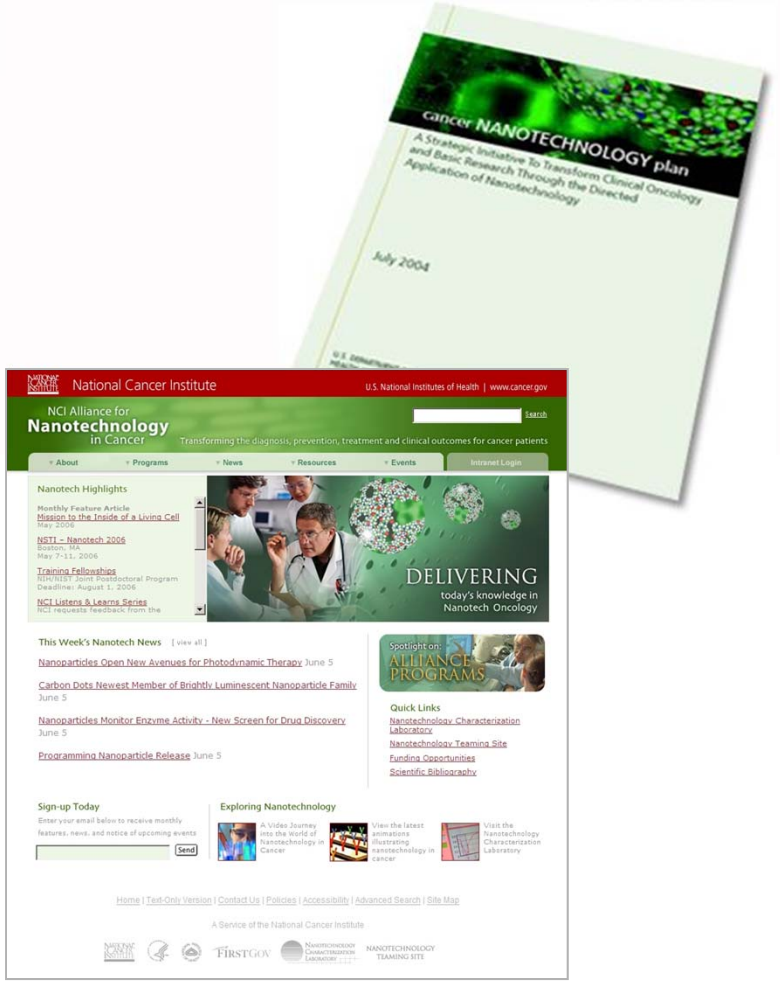
NCI Alliance for Nanotechnology in Cancer



NCI Strategic Approach to Nanotech

NCI Alliance for Nanotechnology in Cancer

- **Early investments**
  - Novel technologies through the Unconventional Innovations Program since 1998
- **Counsel from the community**
  - Input from the scientific, cancer research and advocacy communities
- **Planning a comprehensive effort**
  - Cancer Nanotechnology Plan to drive systems-level change and catalyze product development
- **Launch of the Alliance**
  - NCI Alliance for Nanotechnology in Cancer in 2004
- **Milestone-driven execution**
  - Defined programs; collaborators; milestones; reporting processes



NCI Alliance for Nanotechnology in Cancer

NCI Alliance for Nanotechnology in Cancer

Goals:

- Research tools to identify new biological targets
- Agents to monitor predictive molecular changes and prevent precancerous cells from becoming malignant
- Imaging agents and diagnostics to detect cancer in earliest, most easily treatable, pre-symptomatic stage
- Multifunctional targeted devices to deliver multiple therapeutic agents directly to cancer cells
- Systems to provide real-time assessments of therapeutic and surgical efficacy
- Novel methods to manage symptoms that reduce quality of life

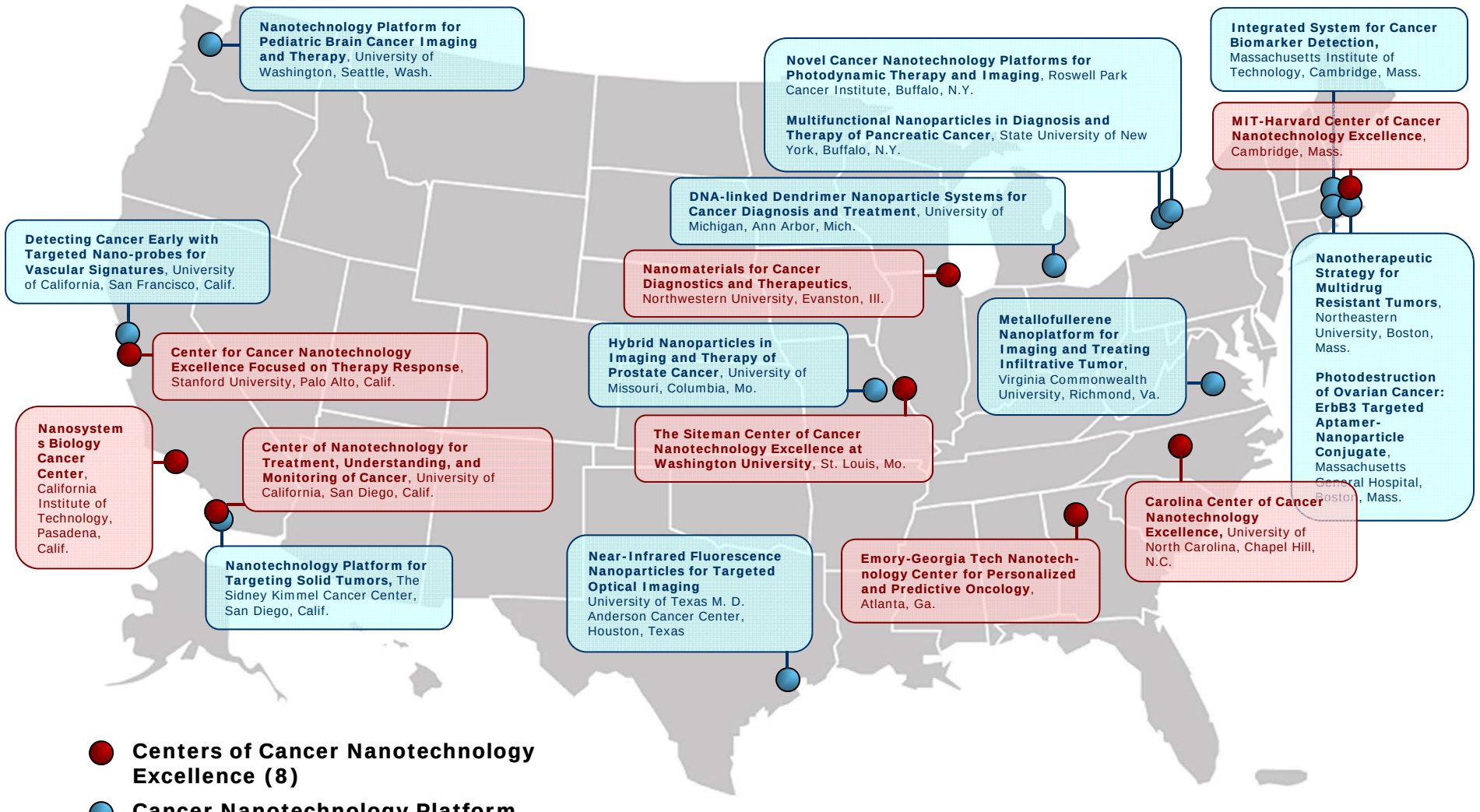
NCI Nanotech Alliance Programs

NCI Alliance for Nanotechnology in Cancer

- Centers of Cancer Nanotechnology Excellence
- Nanotechnology Platforms for Cancer Research
- Multidisciplinary Research Teams
  - Training
  - Interagency Collaborations
- Nanotechnology Characterization Laboratory

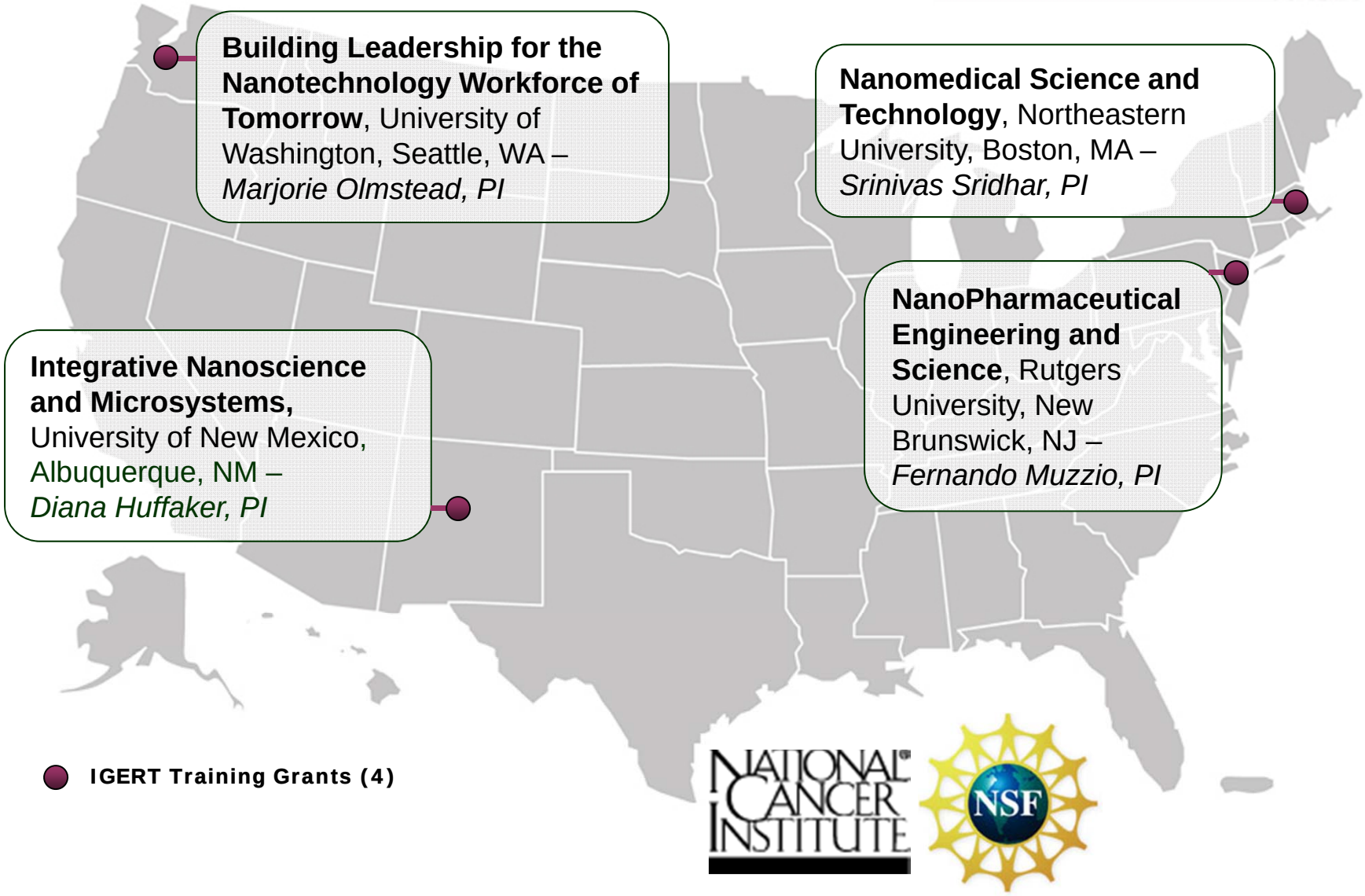
NCI Nanotech Alliance Program Awards

NCI Alliance for Nanotechnology



NCI-NSF Nanobiotechnology Collaboration: Training the Next Generation

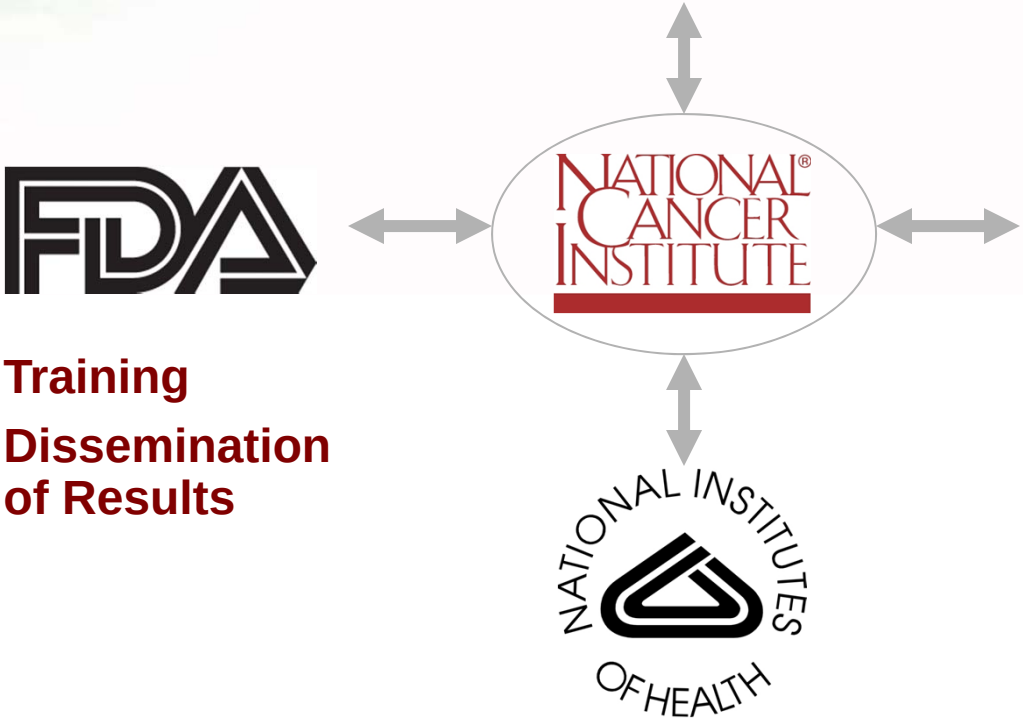
NCI Alliance for Nanotechnology in Cancer



Interagency Collaborations

NCI Alliance for Nanotechnology in Cancer

- **Standards/Precision Measurement Capabilities**



- **Training**
- **Dissemination of Results**

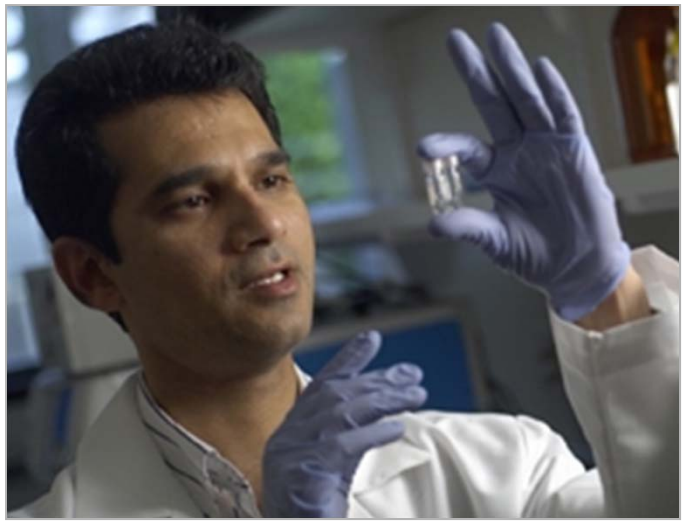
- **Public Interface**
- **Interpret Data on Environment, Health and Safety**

- **Shared Data and Platforms**

Nanotechnology Characterization Laboratory (NCL)

NCI Alliance for Nanotechnology in Cancer

- NCL Role:
  - Interface with CCNEs, individual investigators, NIST and FDA to develop standards and characterization data for nanoscale materials
  - Perform preclinical toxicology, pharmacology, and efficacy testing of nanoscale devices
  - Formulate and validate protocols for physical, *in vitro*, and ADME/tox characterization of nanoparticles



Novel Attributes of the NCI Nanotech Alliance

NCI Alliance for Nanotechnology in Cancer

Steady interaction among Alliance participants and the community through:

- Governance Committee
- Continual evaluation of project programs through performance milestones
- Teleconferences
- Technology Transfer, Intellectual Property, and Communications Working Groups
- Website with “Knowledge Environment” and secure Intranet for Alliance members
- Advocacy involvement on an ongoing basis

NCI Nanotech Alliance: The Challenge and Deliverables

NCI Alliance for Nanotechnology in Cancer

- Produce tangible solutions which are clinically applicable, in a short period of time
- Medical community expects significant advances:
  - Where solutions are currently non-existent
  - Where replacement technologies are superior to existing methods
- Identify “early successes”
- Program as viable addition to existing NCI funding portfolio:
  - Well interconnected
  - Truly produces a paradigm change