



# The NanoHealth Enterprise: Opportunity for Partnerships in Nanoscience Research Communities

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# **NIH Mission**

**NIH is the steward of  
medical and behavioral research  
for the United States.**

## **Science in pursuit of**

- **fundamental knowledge about the nature and behavior of living systems.**
- **application of that knowledge to prevent, detect, diagnose, and treat disease and disability.**

# Scope of Research

## Prevention Research

Exposure  
Routes of Exposure  
Biomarkers of Exposure  
Fate of Material on Entry

## Basic and Clinical Research

Cellular and Molecular Mechanisms  
Biomarkers of Disease/Progression  
Imaging and Sensor Technology  
Therapeutics

## Engineered Nanoscale Materials

Implications

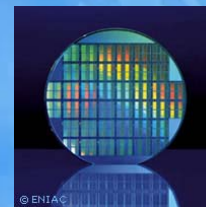
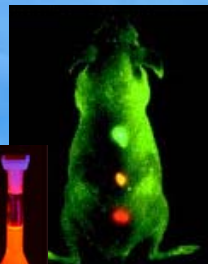
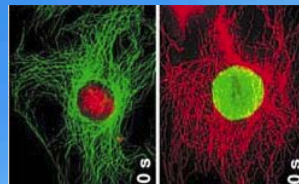
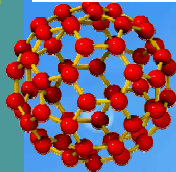
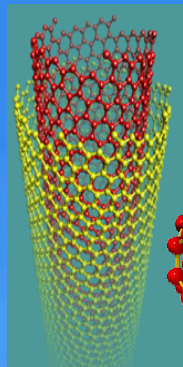
Applications



# Nanotechnology Applications Research

**Goal: Design materials, products or devices for a specific purpose or use**

**Approach: Manipulate size, shape, and chemistry to achieve desired outcome; maximize benefit and minimize risk**

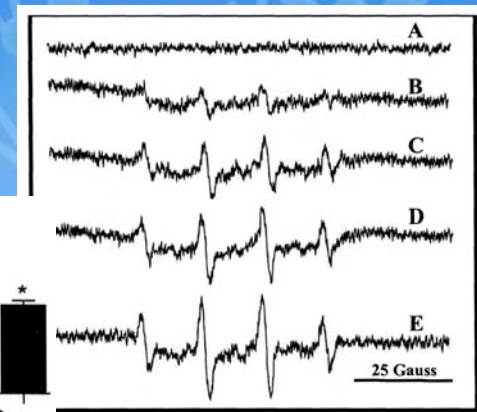
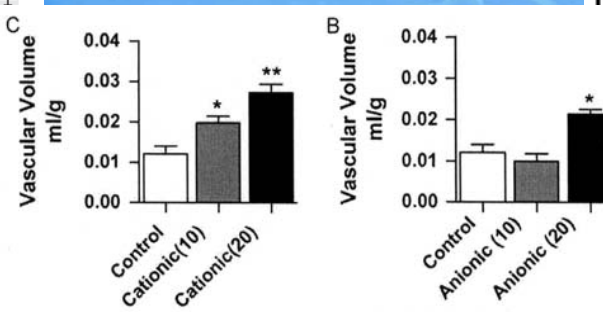
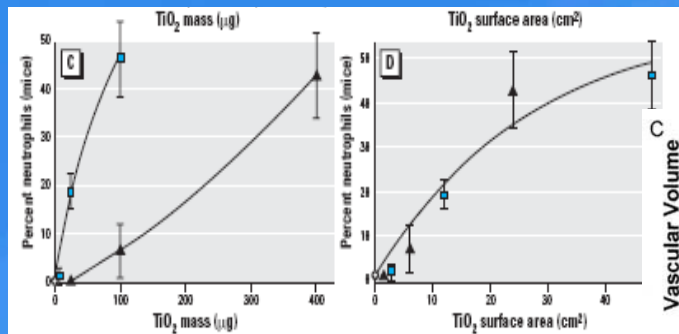




# Nanotechnology Implications Research

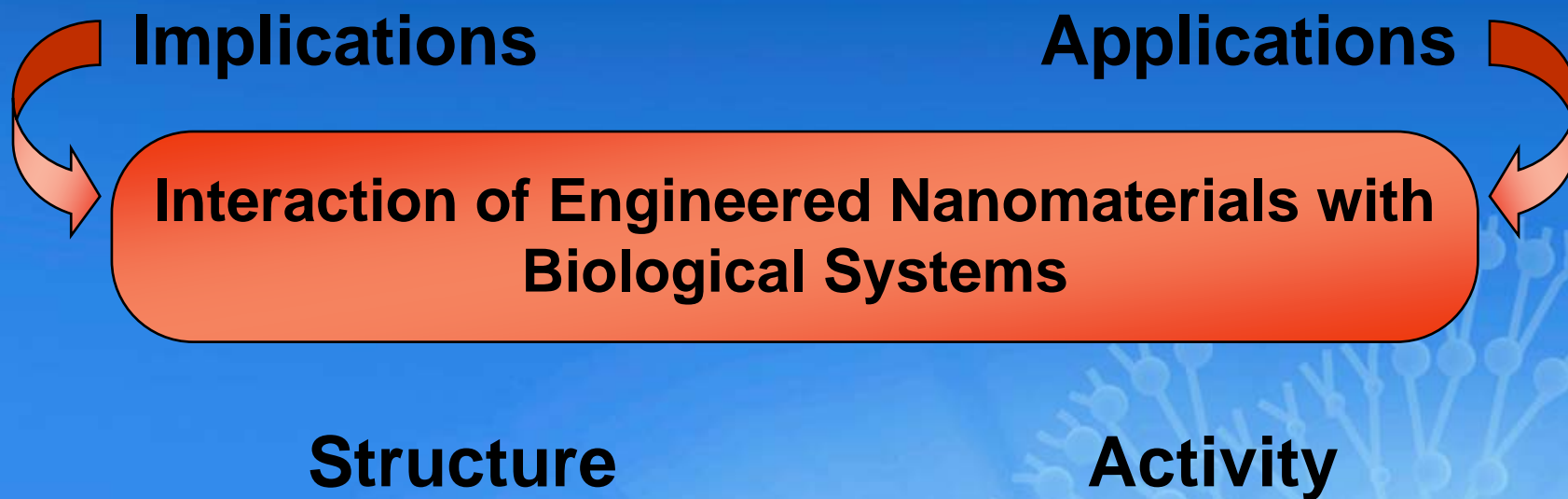
**Goal: Minimize adverse effect on human health and the environment**

**Approach: Understand how materials behave in biological systems**





# Conceptualizing the Science





## Integrating Research Investments through Public-Private Partnerships

- Bring collaborative, entrepreneurial approach to large and complex problems and programs.
- Promote dialogue and coordinated effort across government, industry, and academia.
- Leverage scientific expertise and investment.
- Accelerate high priority projects by procuring services in new ways.
- Facilitate delivery of technology developed by private entities.



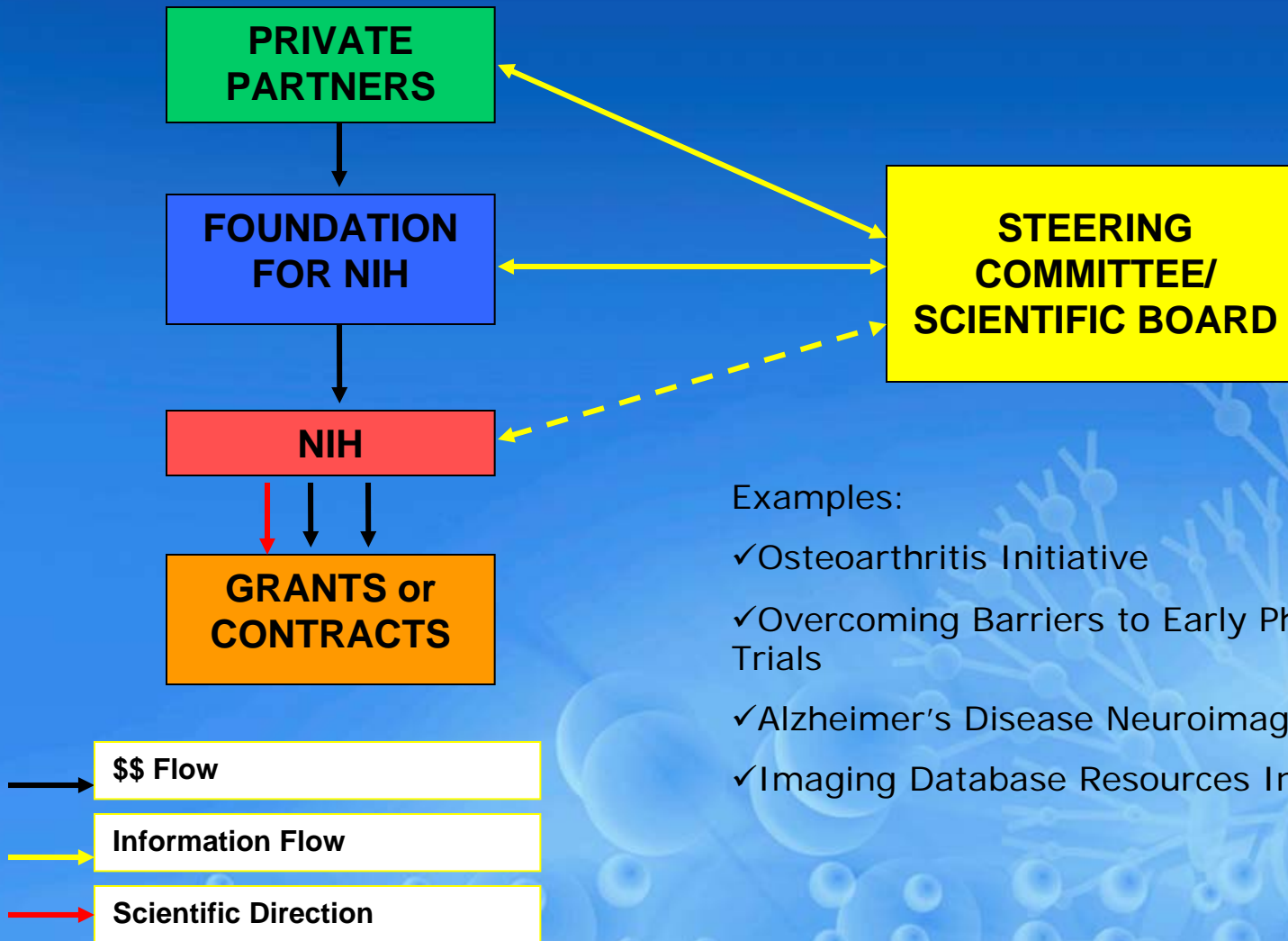
# NIH: Organized for Partnership

## Four Components for Success

- The Partners: science and resources
- Foundation for NIH: organizational structure
- Public Private Partnership Program: policy issues
- Office of General Council: legal issues



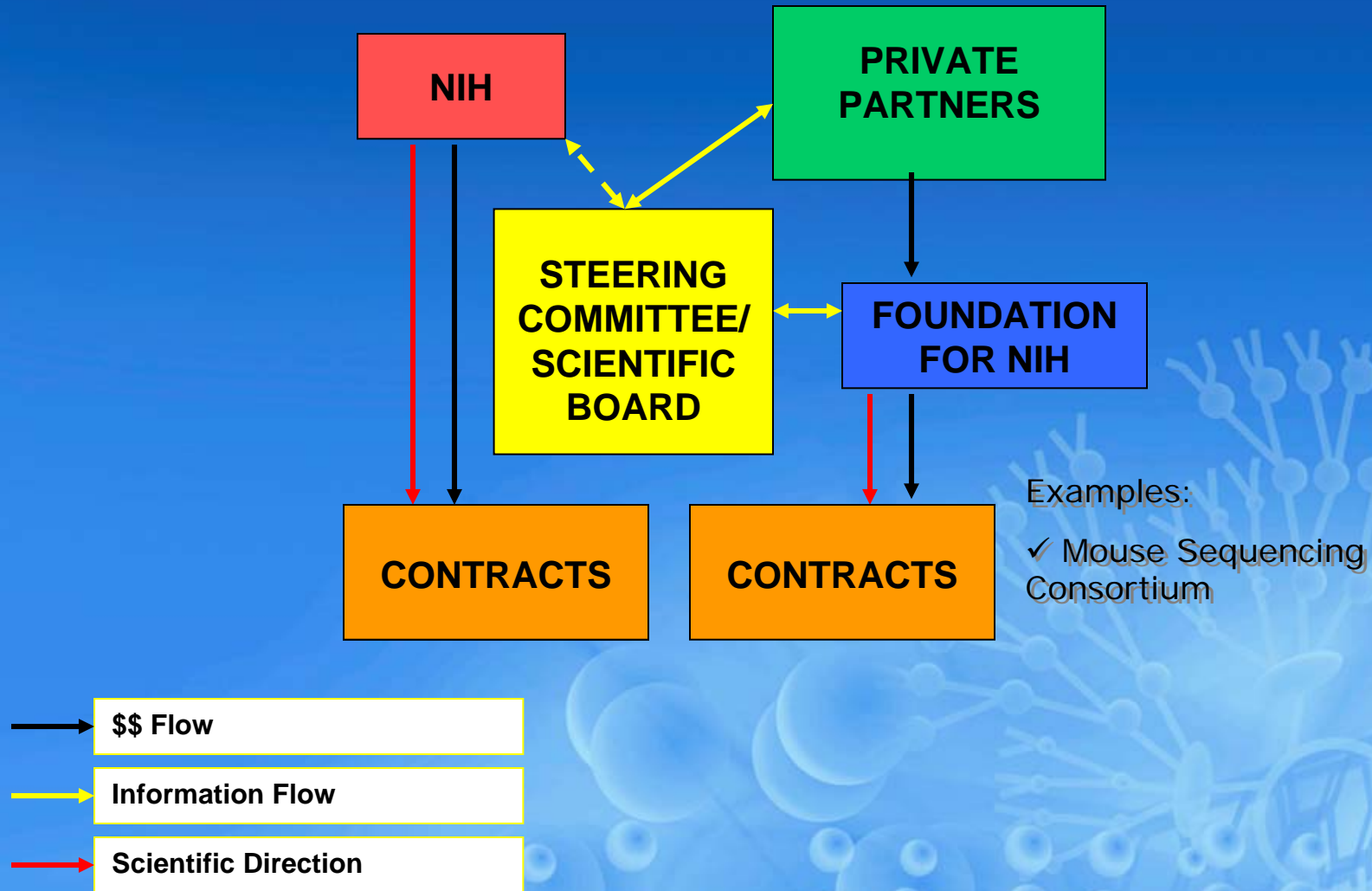
# Model 1: Private Funds to FNIH Pooled with NIH Funding



Examples:

- ✓Osteoarthritis Initiative
- ✓Overcoming Barriers to Early Phase Clinical Trials
- ✓Alzheimer's Disease Neuroimaging Initiative
- ✓Imaging Database Resources Initiative

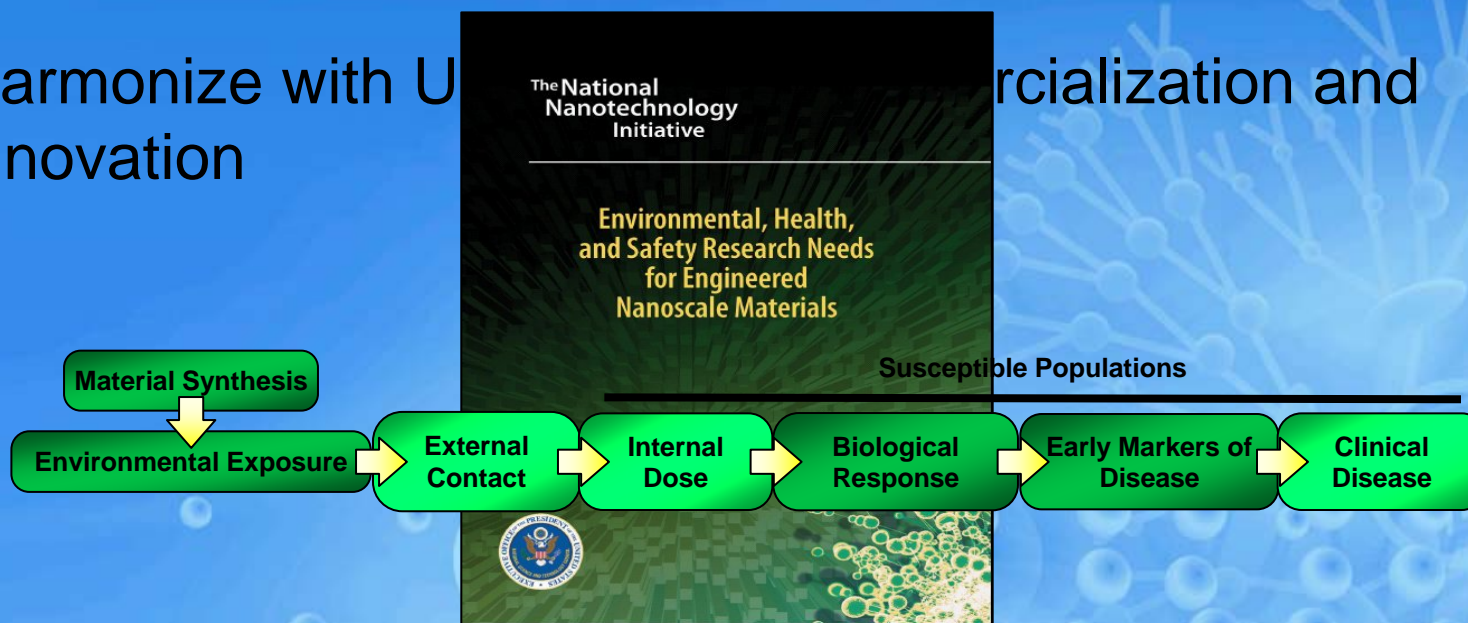
# Model 2: Parallel Funding Mechanism, Supplementing NIH's Efforts





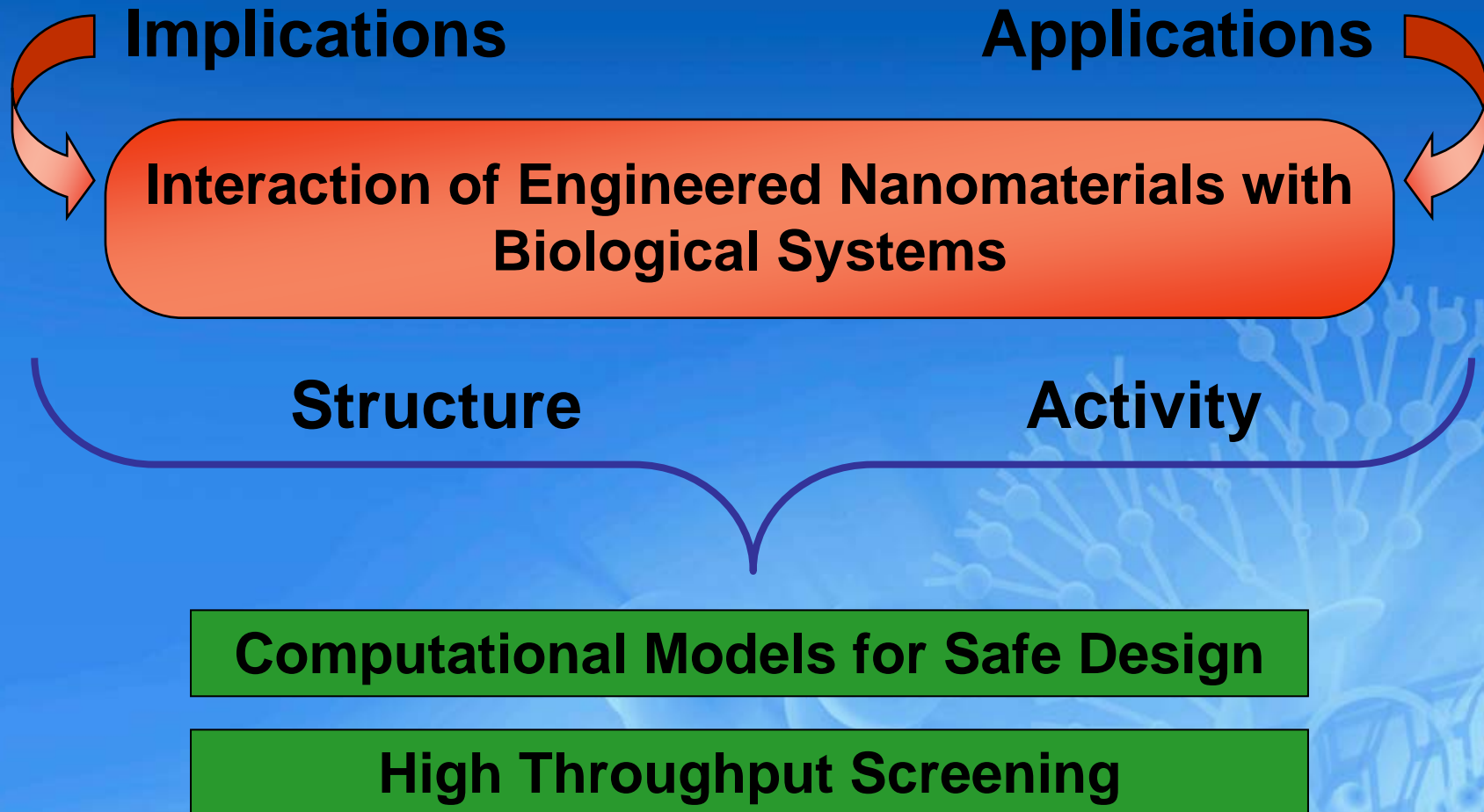
# Building the NanoHealth Enterprise

- Build on the NIH investment and expertise
- Invite stakeholder participation
- Target questions within a shared research strategy
- Harmonize with U.S. innovation

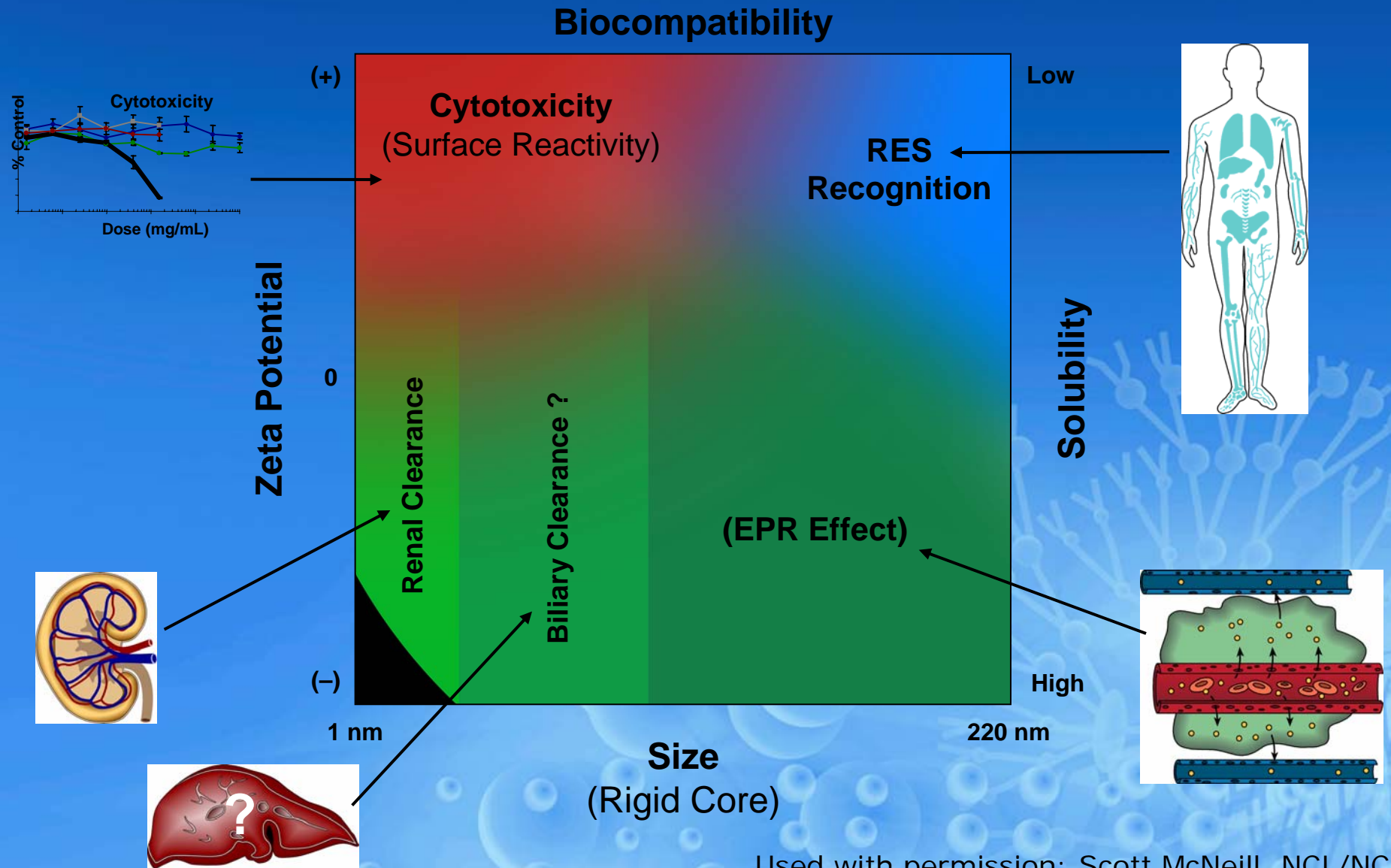




# Conceptualizing Shared Research interests



# Trends in NanoBio Interactions



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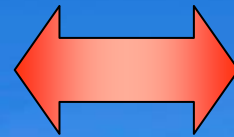


# Expanding the Definition of Research Products

Biologically and clinically relevant design principles

Curated data sharing framework

Network of research partners



Strategic product design and development

Shorter time from concept to manufacture

Data for hazard identification

Standards setting



# Targeted Research Projects

**Implications**

**Applications**

**Interaction of Engineered Nanomaterials with Biological Systems**

**Dose Metrics**

**Uptake by Route of Exposure**

**Interaction with Biological Fluids**

**Informatics Resource**

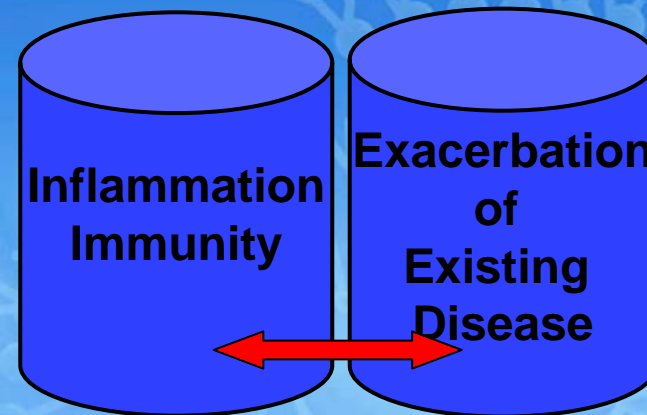
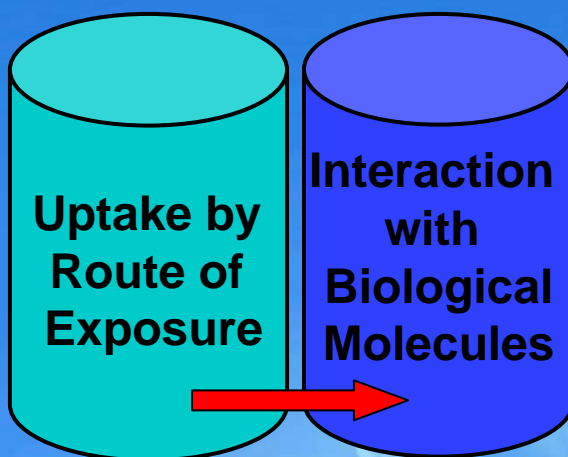


# Exploratory Research Programs

**Implications**

**Applications**

**Interaction of Engineered Nanomaterials with Biological Systems**

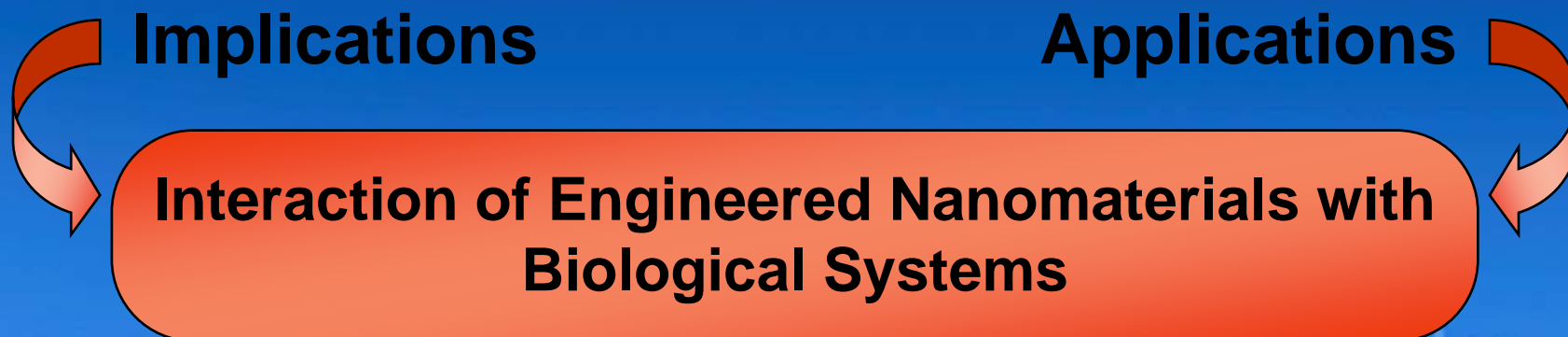


**Informatics Resource**





# Parallel Paths within the NHE



**NHE  
Working  
Groups**

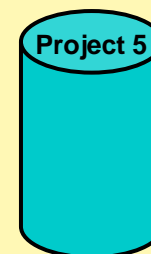
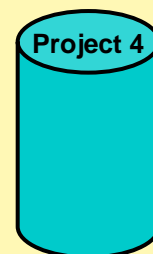
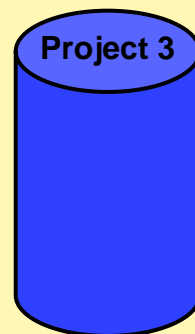
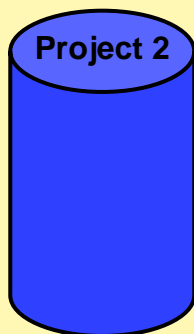
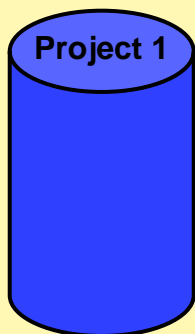
**Industrial/  
Academic  
Projects**

**Informatics Resource**



# Building the NanoHealth Enterprise

## Governance Structure



## Review

## Research Awards



# Building the NanoHealth Enterprise

**Harness the Power of Nanotechnology**



**Enable Discovery**



**Principles of Safe Design**