Mission

Improve human health by leading the development and accelerating the application of biomedical technologies. The Institute is committed to integrating the physical and engineering sciences with the life sciences to advance basic research and medical care.
The Interface

“Biology and Engineering are beginning to cross paths. At their intersection could come remarkable advances in the understanding and treatment of disease.”

FY 2004 NIBIB Actual Budget
(Dollars in Thousands)

- **Centers**: $24,658 (8%)
- **Other Research**: $4,615 (2%)
- **Training (F & T only)**: $5,778 (2%)
- **Contracts**: $8,762 (3%)
- **Intramural**: $1,885 (1%)
- **RMS**: $14,161 (5%)

**FY 04 Actual = $286,684**

FY 2005 NIBIB Budget
(Dollars in Thousands)

- **Centers**: $24,843 (8%)
- **Other Research**: $4,334 (1%)
- **Training (F & T only)**: $7,839 (3%)
- **Contracts**: $11,885 (4%)
- **Intramural**: $5,669 (2%)
- **RMS**: $14,697 (5%)

**FY 05 = $298,109**
NIBIB Funding Growth

Dollars in Millions

- 1.9
- 112.0
- 278.3
- 288.8
- 297.6

Fiscal Year

- 2001
- 2002
- 2003
- 2004
- 2005

NIBIB Established

1st Budget & Grant Awarded
Comparison of Growth in RPG Applications to NIBIB Budget

Investigator-Initiated Applications only

- FY 02: $112 M
- FY 03: $280 M
- FY 04: $289 M

- RPG Applications Received
- NIBIB Budget ($M)
Combined Training and Fellowship Applications and Awards: FY 2002-2004

- Applications
- Total Awards
- New Awards
- Non-Competing Awards

Year: 2002
- Applications: 10
- Total Awards: 5
- New Awards: 3
- Non-Competing Awards: 2

Year: 2003
- Applications: 25
- Total Awards: 20
- New Awards: 15
- Non-Competing Awards: 5

Year: 2004 (Est)
- Applications: 40
- Total Awards: 35
- New Awards: 25
- Non-Competing Awards: 10

- NIBIB
Estimated NIBIB Grantees for FY2004

- Principal Investigators: 796
- Co-Investigators: 1360
- Pre-docs, Post-docs, and support: 2890
- Total: 5046
FY03 Grants

Program Area

- X-ray, E and Ion Beams
- Ultrasound
- Telemedicine
- Tissue Engineering
- Surgical Technologies
- Rehabilitation Engineering
- Platform Technology
- Other
- Optical Imaging
- Nanotechnology
- Nuclear Medicine
- Mathematical Modeling
- MRI & MRS
- Medical Devices & Implant Science
- Image-Guided Therapy
- Image Processing
- Imaging Agents/Molecular Probes
- Magnetic/Bioelectric Devices
- Drug & Gene Delivery
- Biosensors
- Biomechanics
- Bioinformatics
- Advanced Biomaterials

Total costs

- Applied
- Discovery
- Training

Costs range from $- to $60,000,000.
Current NIBIB Portfolio Areas

• Medical devices & implant sciences
• Mathematical modeling, simulation & analysis
• Magnetic resonance imaging & spectroscopy
• Nanotechnology
• Nuclear medicine
• Optical imaging & spectroscopy
• Platform technologies
Current NIBIB Portfolio Areas

• Image processing, displays & perception
• Surgical technologies
• Telemedicine
• Tissue engineering
• Ultrasound, photoacoustics & thermoacoustics
• X-ray, electron & ion beam techniques
• Rehabilitation engineering
NIH Roadmap

New Pathways to Discovery
- Building Blocks, Biological Pathways, and Networks
- Molecular Libraries and Imaging
- Structural Biology
- Bioinformatics and Computational Biology
- Nanomedicine

Research Teams of the Future
- High-Risk Research
- Interdisciplinary Research
- Public-Private Partnerships

Re-engineering the Clinical Research Enterprise
- Re-engineering the Clinical Research Enterprise

Press Release
- Press Release
- Press Release Video
- Science Magazine Article

NIH Roadmap Initiatives
- Grant and Funding Opportunities

More information about the NIH Roadmap can be found on the NIH website.
What is the NIH Roadmap?

- A framework of priorities the NIH as a whole must address in order to optimize its entire research portfolio.
- A vision for a more efficient, innovative and productive system of biomedical and behavioral research.
- A set of initiatives that are central to extending the quality of healthy life for people in this country and around the world.
NIH Roadmap Focus Areas

- Nano-biomedicine
- Biomaterials
- Molecular Imaging
- Computational Biology/Informatics
- Structural Biology

- Inter-Disciplinary Research Training
- Public/Private Partnerships
- Research Communities
- Research Networks
- High-Risk Research
Additional Information

http://nihroadmap.nih.gov
Research Highlights
Micro-Mechanical Sensors for Virus Detection

R. Bashir, ECE, BME
D. Akin, ECE
M. Ladisch, Ag & Bio Engr, BME
S. Broyles, Biochemistry

Objectives:
To develop technology for the rapid detection of virus particles in air
PEBBLE nanosensors for *in vitro* bioanalysis

Raoul Kopelman, Ph.D., University of Michigan

Schematic of a general PEBBLE nanosensor along with three most common matrix materials and options

PEBBLE sizes can range from 20 to 200 nm in diameter
Engineered Self-Assembling scFvs for Piezoimmunosensors
Xiangqun Zeng, Oakland University

Overcoming limitations of whole antibody immunosensors through SAM-based sensing layer

Optimal combination of speed, sensitivity, and selectivity