

What is the single highest priority research focus area that the NIBIB can support to address critical biomedical research or health care needs in approximately the next five years?

- Optical Imaging/Imaging Probes.
- Imaging and other diagnostic technology that has low per-procedure cost and broad application.
- Focused Ultrasound.
- Development of the infrastructure for the next decade of multi-functional probes, instruments with high temporal/spatial resolution, rapid computational data acquisition and analysis.
- Discovery, validation and development of image enhancing agents as signal transducers to link in vivo biology with imaging instruments.
- Development of techniques for interfacing, restoring and repairing function in the nervous system.
- Nanotechnology and its biomedical applications.
- Bioengineering for the understanding of mechanisms of tissue growth and regeneration.
- Mechanobiology of the cardiovascular, nervous, and skeletal systems.
- In silico modeling procedures that bioengineers currently practice.
- Development of chronic, implantable systems for physiological sensing and controlled delivery of therapeutic agents.
- Transform interdisciplinary research from something special to business as usual for appropriate biomedical research projects.
- Molecular imaging.
- Multi-dimensional functional imaging with integration/co-registration of complementary information from multiple platforms.
- Foster development of new molecular methods for imaging specific cellular events.
- Nanoscale science and technology applied to medicine and biology.
- Develop and apply nanobioscience/ technology fundamentals.
- Support the development of novel, high-risk/high-payback, minimally invasive technologies for diagnostics and therapy that have the potential to be used by physicians.
- High-field MRI: development of physiological and metabolic methods.



- Transition genomics revolution to the clinic.
- Nanotechnology – create & characterize functional materials, devices and systems, as well as exploitation of novel properties and phenomenon at this scale.
- Quantitative understanding of molecular structures and processes.
- Bio-inspired and biomimetic materials science.
- Team with NIH ICs to develop “Period Table Analog” for Proteins.
- Neuroengineering, Bio-Chem Terrorism.
- Support “grass-roots” (investigator-initiated) research priorities.
- Personalized treatment through combined, targeted imaging and therapy.
- Molecular imaging.
- Characterize vascular plaque using novel non-invasive and intravascular “imaging” devices.
- Work closely with NCI to develop imaging techniques which will facilitate early cancer detection.
- Establish inter-disciplinary centers for the development of cellular and tissue engineering through real applications.
- Next generation optical imaging systems for measurement of multi-spectral signatures; next generation IGI systems that meet the challenges posed by molecular imaging for improved target recognition and response measurement.

