What is a large-scale project appropriate for the NIBIB's mission or a promising emerging technology that can be applied to bioengineering or biomedical imaging research and will have a high-impact on health care needs?

- Integrated Imaging.
- Fast, photon-counting, energy discriminating x-ray detectors and their application for radiography and low dose dynamic CT.
- Medical Image Computing.
- Development of comprehensive image databases (for storage, visualization, registration, interpretation of data from different technologies).
- Map the imageable proteosome in mouse models of major human diseases using forward and reverse chemical genetics (imageomics).
- Development of a brain interface using electrical and chemical techniques for acquisition of information and modification of function.
- Nanotechnology and its biomedical applications.
- Complete model of the endothelial cell that includes structural and functional response to biochemical and mechanical stimuli.
- Therapeutic blood vessel growth & neural repair in adults.
- Relate genotypes to phenotypes.
- Closed-loop control of glucose in diabetics or of blood pressure in hypertensives.
- Center grants which enable effective MD-PhD translational work for new device projects targeting industry-academic collaborations & outcomes for cancer.
- Combine technology development (hardware, computation, advanced visualization) with the development of realistic biological models and systems to impact broad areas of biology and medicine.
- Nanotechnology for detecting/monitoring molecular technologies for diagnosis and intervention.
- Creation of functional, three-dimensional, heterogeneous tissue constructs.
- Novel technologies for tissue engineering.
- Nanoscale sensors for in vivo analysis of single cells to elucidate disease mechanism and cellular pathways.
- Optical Imaging.
- DNA diagnostics.

- Imaging Technology Assessment – methods for evaluation and comparison of new and existing imaging technologies to establish effectiveness, robustness & range of applicability.
- Tools for obtaining quantitative data about molecular structures and processes.
- Bio-inspired and biomimetic materials for artificial organ applications.
- Lead the development and integration of nano, bio, information and cognition design principles for biology and medicine.
- Development of sensor-based technologies for imaging (EEG, EKG, EMG), for motor abnormalities, and for basic neurophysiology.
- Nanoimaging, mixed-spectrum imaging, and novel inversion technology.
- Multi-modality image guided tissue procurement and therapy.
- Optical imaging.
- Develop molecular imaging and biosensors to exploit new genomics knowledge, to monitor disease processes and to detect biological threat agents.
- Encapsulated cell technology.
- The nano/bio Interface – new targeted contrast agents, new generation of biosensors, new technology for quantitative accurate estimation of gene expression.
- Development of next generation software tools including open source and related databases for validation; Tera Hertz Imaging.