...Imaging at the Molecular, Cellular, and Organ Levels

The rapidly growing field of biomedical imaging enables one to visualize physiological structures, measure biological functions, and evaluate cellular and molecular events without requiring invasive procedures. Opportunities in imaging span all of the major, and emerging, modalities, including magnetic resonance imaging (MRI); positron emission tomography (PET); single photon emission coherence tomography (SPECT); ultrasound imaging; optical coherence tomography (OCT); computed (x-ray) tomography; bioluminescence imaging; fluorescence imaging; and other optical imaging methods including novel technologies like cryo-imaging.

The Department of Biomedical Engineering at Case Western Reserve University is a recognized leader in biomedical imaging research, and our research program serves as a cornerstone for a number of interdisciplinary programs, including cancer detection, gene therapy, nanotechnology, drug delivery and understanding of metabolic diseases like diabetes.

Our research program aims to define medical imaging technology and applications that will be used both in the laboratory and in the clinical setting now and in the coming decade. By providing a program with strength in instrumentation and devices, computational algorithms, new imaging compounds, and novel clinical applications, we are confident that our program will continue to lead imaging innovation. Applicable skills include: chemistry, numerical methods and programming, electronics, physics, optics, biomedical engineering, digital systems, physiology, biology, and/or design.

To achieve this mission, our imaging research includes, but is not limited to: developing new imaging modalities that provide unprecedented spatial resolution in the clinical setting; new computer algorithms and hardware that will lead to improvements in image quality, exceeding those over the past two decades; and using genetic information to develop new chemical compounds that reveal tumor margins or become active only in the presence of unique biological markers.
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