

SPECIAL SECTION GUEST EDITORIAL

Optical Imaging from Bench to Bedside

The first Inter-Institute Workshop on Optical Imaging from Bench to Bedside at the National Institutes of Health (NIH) in Bethesda, Maryland, was held in 1999 and focused on microscopy, subsurface imaging, diffuse imaging, and spectroscopy. The number and variety of topics presented at the 4th workshop held in September 2004 have grown dramatically. The latest advances in molecular imaging, women's health, brain imaging, coherent and diffused imaging, and multimodality imaging were discussed.

Continuing the tradition of this optical imaging workshop is important to the NIH. The NIH charted a "roadmap" for medical research in the 21st century in 2003 that included two major initiatives highlighted in the Bench to Bedside Workshop: molecular imaging and translational and interdisciplinary research.

The molecular imaging initiative was created to enhance the discovery and availability of small molecules for molecular imaging. Ultimately, this effort is aimed to enable personalized profiles of cell and tissue function, which may lead to more individualized approaches to diagnosing and treating disease.

The translational research initiative's goal is to improve human health by translating scientific discoveries into practical applications. Such discoveries typically begin at "the bench" with basic research—where scientists study how diseases develop and spread—then progress to the clinical level, or the patient's "bedside." Researchers have become increasingly aware that this bench-to-bedside approach to translational research is really a two-way street. Not only do basic scientists deliver to clinicians new tools to examine in patients, clinical researchers also make novel observations about the nature and progression of disease that can stimulate basic investigations.

Interdisciplinary research that integrates the analytical strengths of two or more often disparate scientific disciplines to solve a given biological problem is encouraged by the NIH roadmap. Optical imaging supports this initiative as an interdisciplinary field—often needing physicists, engineers, and chemists to combine their research tools, approaches, and technologies to more powerfully solve the puzzles of complex health problems.

With the support of the NIH roadmap initiatives for molecular imaging and translational and interdisciplinary research, the 4th Inter-Institute Workshop was extremely successful. Three hundred and fifty people attended the workshop including university researchers, students, government scientists, and industrial entrepreneurs and scientists (from the United States and abroad).

The workshop was 3 days long consisting of 8 sessions with 44 presentations, 117 posters, and 3 panel discussions. Discussions held officially and unofficially during the workshop were very fruitful and enlightening. A few imaging devices already found their way to the clinical setting (i.e., OCT in ophthalmology and cardiology and confocal imaging in dermatology) and hopefully others will follow.

After the workshop, the next natural step was to dedicate a special section with peer-reviewed papers reporting translational research on biomedical optical imaging. The result is the issue in your hands. We hope you will enjoy reading it as much as we enjoyed editing it.

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Special Section Guest Editors**

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Bench to Bedside at the National Institutes of Health