

## Volume 2, Number 26 – November 11, 2008

### REAL-TIME IMAGING

#### Dynamic Imaging of Cells Accompanying Cancer Achieved in Mice

Neoplasms contain a microenvironment of multiple other cell types that exist alongside the carcinoma cells. Termed stromal cells, they include such cells as fibroblasts, lymphocytes, dendritic cells, and macrophages. These elements combine with extracellular factors, such as growth factor, collagen, and oxygen, to form a milieu that evolves along with the carcinoma cells and influences tumor growth. A recent study sought to image and assess these parallel elements, with the authors developing and using multicolor imaging techniques within a live mouse.<sup>1</sup> As published in *Disease Models & Mechanisms* and reported in *Science*,<sup>2</sup> the authors described designing a spinning disk confocal microscope that achieved image acquisition times of 17 and 33 milliseconds for 512 x 512 and 1024 x 1024 pixel images, respectively. Led by researchers from the University of California, San Francisco, the study typically collected 32,400 images in a 12-hour period, then documented the location and movement of stromal cells and oxygen's effect upon them. **Conclusion: A novel *in vivo* imaging technique affords high-resolution, four-color, prolonged, real-time imaging of cells that accompany cancer.**

### MRI & CT PHOTOGRAPHY

#### Radiologist Wins Lennart Nilsson Award for Scientific Photography

The journal *Nature* recently reported that radiologist **Anders Persson** of Sweden has won the Lennart Nilsson Award for scientific photography, citing his stunning computer-enhanced, three-dimensional images made using new techniques in MRI and CT.<sup>3</sup> Dr. Persson was quoted as saying that technical research should benefit the patient, and that he wanted to show precise and colorful details to achieve that end. He discussed the utility of imaging in forensic medicine, including the performance of virtual autopsies. Such post-mortem exams can allow discovery of facts not appreciable in conventional autopsies, such as gas in wounds or small metal particles under the skin. Persson currently is working on several new facets of medical imaging, including multi-energy CT to visualize the body's chemical constitution. **Conclusion: The Lennart Nilsson Award for scientific photography has been awarded to Swedish radiologist Anders Persson.**



A chimpanzee examined with computer tomography, using volume-rendering 3D technique.

### MRI ACCURATE TEMPERATURE

#### MRI Pulsing Sequences Yield Accurate Temperature Imaging

Temperature plays an integral role in medicine. Its change can reflect metabolism, immune function, and cancer. For example, digital infrared thermal imaging for breast cancer detection was recently reported to show high sensitivity and negative predictive value, depending on the method used.<sup>4</sup> The current and developing arsenal of various disease therapies includes

hyperthermic treatments and thermally sensitive agents that can selectively release drugs based on heat range. Noting that temperature is a fundamental quantity of matter that proves extremely difficult to measure noninvasively below an object's surface, researchers sought to image it in a broad range of environments with magnetic resonance.<sup>5</sup> As reported recently in *Science*, researchers at Princeton and Duke Universities have reported accurate temperature imaging with MRI, using a new pulsing method, and obtained *in vivo* mouse images.

**Conclusion: Newly developed MRI pulsing sequences can achieve rapid and accurate internal temperature images.**

## SOURCES

1. Egeblad M, Ewald AJ, Askautrud HA, *et al.* "Visualizing Stromal Cell Dynamics in Different Tumor Microenvironments by Spinning Disk Confocal Microscopy." *Disease Models & Mechanisms* 2008; 1:155-167; doi:10.1242/dmm.000596.
2. "Solid Tumors in Living Color." *Science* 2008; 322:506.
3. "Q&A: An Insider's View of the Body." *Nature* 2008; 455:1036.
4. Arora N, Martins D, Ruggerio D, *et al.* "Effectiveness of a Noninvasive Digital Infrared Thermal Imaging System in the Detection of Breast Cancer." *Am J Surg*, October 2008; 196(4):523-6.
5. Galiana G, Branca RT, Jenista ER, *et al.* "Accurate Temperature Imaging Based on Intermolecular Coherences in Magnetic Resonance." *Science* 2008; 322:421.

## NEXT ISSUE: MORE CLINICAL TRIAL IMAGING NEWS AND STUDIES



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