Molecular imaging techniques such as combined positron emission tomography (PET) and computed tomography (CT) offer noninvasive ways of measuring biologic processes in the body at the cellular or molecular level.

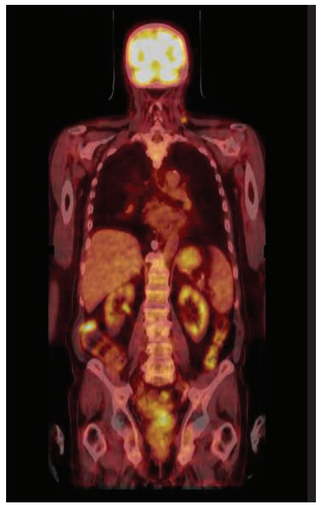
Molecular Imaging Program

The ability to see inside a living organism and watch its biological functions sounds like a futuristic dream of X-ray superhero proportions. Yet revolutionary advances in imaging over the last decade make this a reality.

Molecular imaging techniques such as combined positron emission tomography (PET) and computed tomography (CT) offer noninvasive ways of measuring biologic processes in the body at the cellular or molecular level. This has important implications for research as well as for patient care. Molecular imaging enables scientists and clinicians to view processes in the body that contribute to disease such as altered cellular metabolism and gene expression. In clinical care, doctors use molecular imaging to diagnose cancers and monitor therapies. Molecular imaging has also been used to diagnose and better understand various neurologic, psychiatric, and cardiac diseases.

Initiated in August 2005, the Molecular Imaging Program at Huntsman Cancer Institute (HCI) is a joint effort of HCI, the University of Utah's Brain Institute, and the Departments of Radiology and Internal Medicine. "Complicated medical problems require that scientists work as a team," says John M. Hoffman, MD, professor of radiology and neurology at the University of Utah and director of HCI's Molecular Imaging Program. "This program facilitates teamwork."

While the Molecular Imaging Program influences research and patient care across disciplines, it focuses on treating HCI patients and providing state-of-the-art imaging techniques to cancer researchers.



The Molecular Imaging Program team includes radiochemists, a radiopharmacist, a research associate, and engineers/operators of the cyclotron, a machine used to manufacture imaging agents for positron emission tomography (PET).

"With PET/CT imaging, we're able not only to improve staging and characterization of cancer, but also assess patient response to therapies more accurately and earlier than with other types of imaging," Hoffman says. "As scientists gain a better understanding of the fundamental molecular nature of disease, molecular imaging will assume an ever more important role in furthering our understanding of human disease, monitoring therapy, and caring for patients in the future."

At the age of 29, only four months after giving birth to her second child, Mistie Davis, a nurse from Heber, Utah, was diagnosed with cancer—a tumor in her lung. On the referral of her pulmonologist in Utah County, Mistie sought treatment at Huntsman Cancer Institute (HCI).

"A PET scan showed exactly where the cancer was and also that that's *all* there was," Mistie says, indicating that her cancer had not spread. HCI physician and professor in the Department of Surgery at the University of Utah, Shreekanth Karwande, MD, performed surgery. It was all the treatment Mistie needed, without radiation or chemotherapy to follow. She currently receives chest X-rays every three months and will likely have X-rays as follow-up for the rest of her life. It's a small undertaking, and one Mistie is glad for—she lost her own father to cancer when he was only 27 years old.

"Other than being a little short of breath, I'm functioning really well now," she says. "I was one of the lucky ones."

Call it luck, fate, or chance, Mistie says, "I've been very blessed. I'm able to take care of my kids."

advance