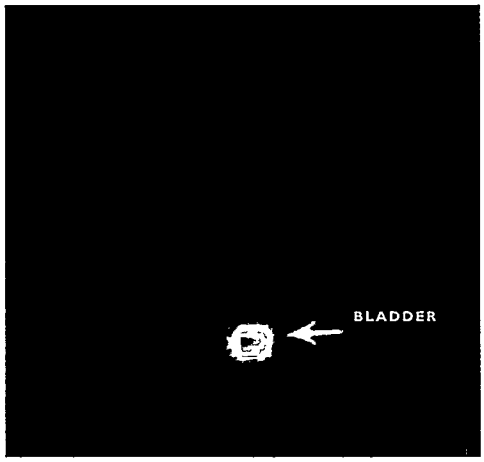
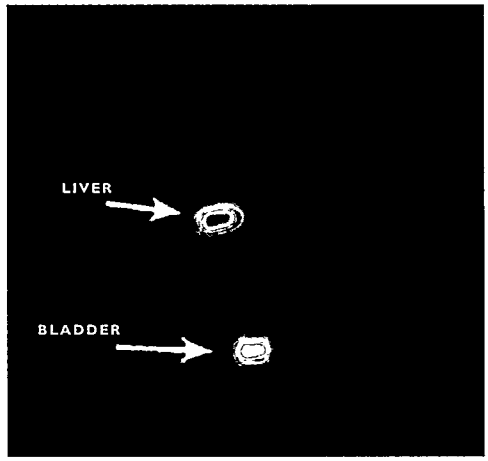
ments become clinically manifest.

The BER program will also press ahead with the basic environmental research that must undergird the Department's cleanup commitments, particularly the stubborn, long-term restoration problems that are beyond the reach of today's remediation technologies. The Microbial Genome Initiative is one part of this continuing research. Another is a coordinated effort at the William R. Wiley Environmental Molecular Sciences Laboratory (EMSL), whose operational start-up corresponds with the 50th anniversary of the AEC's Division of Biology and Medicine. EMSL is the first major facility for which the BER program assumed principal stewardship and represents an important transition to "big science." This facility will open new vistas on the chemistry of our environment, including insights into how chemical waste streams and contaminated environments can be cleaned up, as well as clues to the long-term fate of chemicals released into the ground, air, and surface waters. In the years ahead, 200 staff scientists will work here at the forefront of such fields as waste processing, bioremediation, and atmospheric chemistry. OBER is also committed to seeing EMSL become an internationally recognized user facility, where visiting scientists can study environmental processes at the molecular level, with applications to environmental cleanup and sustainable development.

Yet a third facet of the BER program's environmental commitment is the Natural and Accelerated Bioremediation Research (NABIR) program, conceived in 1995. NABIR is building on the foundation laid by the subsurface science program, bringing together geologists, chemists, biochemists, molecular and cellular biologists, microbiologists, and ecologists to focus on important bioremediation questions. The goal is to combine laboratory studies, field studies at contaminated sites, and theoretical research to enhance the scientific basis for using bioremediation to restore and protect the environment.

Also part of the environmental picture is global environmental change, an understanding of which must be a critical ingredient in our technological choices. The sub-

Reporting from the scene Positron emission tomography has now been used to detect the details of genetic activity. In these two images, a living mouse has been injected with a reporter probe that discloses itself to PET imaging, as well as an adenovirus (which accumulates in the liver) carrying both a gene-therapy gene and a PET "reporter gene." In the left-hand image, neither gene is active, so the probe has diffused through the bloodstream and passed through the kidneys to the bladder. In the right-hand image, both genes have been activated by a genetic promoter carried by the adenovirus. The reporter gene produces a protein that binds the reporter probe, which thus reveals the simultaneous activity of the therapeutic gene in the liver. Experiments such as this, performed at UCLA, are hopeful harbingers of an age of molecular nuclear medicine.