

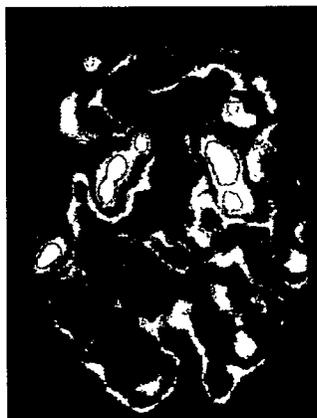
Fifty Years of Achievements...

Leading to Innovative Solutions

Tools for Medicine and Research

Radioisotopes developed for medicine and medical imaging are being merged with current knowledge in biology and genetics to discover new ways of diagnosing and treating cancer and other disorders, detecting genes in action, and understanding normal development and function of human organ systems.

- Radioactive molecules used in medical imaging for positron emission tomography (PET) and magnetic resonance imaging (MRI) allow noninvasive diagnosis, monitoring, and exploration of human disorders and their treatments.
- Isotopes and other tracers of brain activity are being used to explore drug addiction, the effects of smoking, Alzheimer's disease, Parkinson's disease, and schizophrenia.
- Technetium-99m is used to diagnose diseases of the kidney, liver, heart, brain, and other organs in about 13 million patients per year.
- Striking successes have been achieved using charged atomic particles to treat thyroid diseases, pituitary tumors, and eye cancer, among other disorders.



One-quarter of all patients in U.S. hospitals undergo tests using descendants of cameras developed by BER to follow radioactive tracers in the body. PET scanning has been key to a generation of brain metabolism studies as well as diagnostic tests for heart disease and cancer. PET studies above reveal brain metabolism differences in recovering alcoholics (left, 10 days, and right, 30 days, after withdrawal from alcohol).



The laser-based flow cytometer developed at DOE national laboratories enables researchers to separate human chromosomes for analysis.

Genome Projects

A legacy of DOE research on genetic effects paved the way for the world's first Human Genome Program. Now new genomic technologies are being applied to environmental cleanup through the DOE Natural and Accelerated Bioremediation Research and Microbial Genome programs, healthcare and risk assessment, and such other national priorities as industrial processes and agriculture.

Discover the breadth of current activities and recent accomplishments via the BER Web Site:

http://www.er.doe.gov/production/ober/ober_top.html