

July 2001

Published by the Community Involvement Office
Building 130, P.O. Box 5000
Upton, NY 11973
Phone: 631 344-2345 Fax: 631 344-3654
www.bnl.gov

Experimental Microbeam Radiation Therapy May Offer Improvement Over Traditional Radiation Treatments

- Brookhaven researchers are investigating an experimental form of radiation therapy, known as microbeam radiation therapy, which appears to be less damaging to healthy brain tissue than traditional radiation therapy.
- The scientists are specifically looking for a treatment for brain tumors in infants and young children, because developing brains are particularly susceptible to radiation damage.
- In ongoing research at the National Synchrotron Light Source, the technique has been shown to be less damaging to normal tissue than conventional x-ray beams.
- The therapy has not yet been tested in humans. But the hope is that, eventually, it could be used to destroy pediatric brain tumors, or at least significantly delay their growth, without damaging as much surrounding tissue as conventional broad-beam x-rays do.
- The U.S. Department of Energy, which supports basic research in a variety of scientific fields, and the Children's Brain Tumor Foundation funded this research.



National Synchrotron Light Source

Brookhaven Laboratory and Psimei Pharmaceuticals Ltd. Develop Boron Compounds For Potential Cancer Treatments

- The Department of Energy's Brookhaven National Laboratory and Psimei Pharmaceuticals Limited have signed a Cooperative Research and Development Agreement to develop Brookhaven-invented boron compounds for use in an experimental radiation therapy for cancer.
- The new boron compounds are expected to deliver higher concentrations of boron to certain tumors than to normal surrounding tissues, which may make them effective for an experimental cancer therapy known as boron neutron capture therapy (BNCT).
- In addition to use in BNCT, the new boron compounds may be useful for improving the effectiveness of conventional x-ray therapy, which kills tumors with x-rays; and for photodynamic therapy, in which lasers and photosensitizers destroy tumors.

(over)

Unraveling the Mysteries of Neutrinos

- Neutrinos pervade the universe, yet these particles remained undetected until 1956. Since that time, neutrinos have been a favorite object of study for Brookhaven scientists who have been investigating the properties of these weakly interacting and neutrally charged entities, using them to answer questions about the fundamental forces that govern all matter.
- One of the three types of neutrinos, the muon-neutrino, was discovered at Brookhaven in 1962. In 1988, researchers Jack Steinberger, Leon Lederman, and Melvin Schwartz received the Nobel Prize in physics for their discovery at the Alternating Gradient Synchrotron, which at the time, was the most powerful accelerator in the world.
- Since the early 1970s, several experiments have detected neutrinos arriving on Earth from the Sun, but they have found only a fraction of the number expected from detailed theories of energy production in the Sun. This meant there was something wrong with either the theories of the Sun, or the understanding of neutrinos.
- Last month, results from the Sudbury Neutrino Observatory collaboration, which includes Brookhaven scientists, showed the solution lies not with the Sun, but with the neutrinos, which change as they travel from the core of the Sun to the Earth.
- Details on this exciting science may be found on the web by searching for "neutrinos" from the Laboratory homepage, www.bnl.gov.



Sudbury Neutrino Observatory,
Ontario, Canada, during construction

Lab Licenses Mercury-Waste Treatment Technology

- A mercury-waste treatment technology developed at the Lab has been licensed to Newmont Mining Corporation, the largest gold producer in North America.
- Brookhaven's technology chemically stabilizes and solidifies liquid elemental mercury, a byproduct of gold mining, to safely isolate the material from the environment.
- Brookhaven's new technology should make disposal of mercury practical and safe.

Upcoming Events Open to the Public

- **Summer Sunday Tours, Sundays, July 8 through August 26, 10 a.m. to 3:00 p.m.** Free.
- **Nnenna Ogwo, piano, July 25, noon, Berkner Hall:** Nnenna Ogwo has performed in Budapest, Vienna, Montivideo, and numerous U. S. locations. A graduate of the Ferenc Liszt Academy of Music in Budapest, and the Oberlin Conservatory. The recital will feature works by Bach, Beethoven, and Scriabin. Free.