

Happy Holidays!



**Pacific Northwest National Laboratory**

Operated by Battelle for the U.S. Department of Energy

# Sharing the Excitement of Science

## Breakthrough Science and Technology for the Northwest

Richland, Washington

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### Counterterrorism technologies in the spotlight

A holographic imaging system that scans people at airports for hidden weapons, a device that looks for threats and contraband in sealed containers, and an innovative polymer that helps detect nerve agents were among the counterterrorism technologies demonstrated by Pacific Northwest National Laboratory engineers as part of the U.S. Department of Energy's technology expo held in the Forrestal Building in Washington D.C. in November.

The holographic imaging system originally was designed for the Federal Aviation Administration to detect both metallic and nonmetallic items—such as plastic or ceramic handguns and knives, and plastic and liquid explosives—that could be concealed under clothing. The Acoustic Inspection Device, or AID, is a handheld device that can determine the liquid contents of sealed containers. It originally was developed for U.S. and Russian chemical weapons bilateral treaty verification and for inspection of chemical weapon stockpiles in Iraq following the Gulf War. Mehl, Griffin and Bartek, a company in Arlington, Va., is customizing AID for the U.S. Customs Service. For more about how PNNL is helping keep America safe, see <http://www.pnl.gov/news/2001/01-34.htm>.

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### A "cell-out" show—Laboratory participates in Cell Biology meeting

Pacific Northwest National Laboratory was among the research institutions with exhibits at the 41<sup>st</sup> Annual Meeting and Trade Show for the American Society For Cell Biology in Washington D.C., Dec. 9-12. The show is the largest international meeting for cell biologists with 3,000 presentations on scientific research, 340 exhibitors and more than 8,200 attendees.

The Laboratory's booth featured many of the U.S. Department of Energy's multi-disciplinary user facilities including the William R. Wiley Environmental Molecular Sciences Laboratory (EMSL) on PNNL's campus. The exhibit highlighted EMSL resources such as molecular dynamic simulations, mass spectrometry, the combined microscope and structural genomics. It spoke to the future of PNNL's programs such as the Cellular Observatory, Virtual Biology, Microbial Cell Dynamics and High-Throughput technologies. Steve Wiley, director of PNNL's Biomolecular Network Initiative, also moderated and presented a panel workshop on multidisciplinary integration in cell biology. Read about the Biomolecular Networks Initiative at <http://www.biomolecular.org>.



PNNL's Steve Wiley talks with visitors who stopped at the "Biomolecular Systems, from the Molecular to the Cellular Level" exhibit.

### Energy savings—up on the rooftop

Investing in equipment intended to save energy will only help the bottom line if the equipment is working properly. Researchers at Pacific Northwest National Laboratory are developing a diagnostic system that can let building managers be sure that economizer devices for rooftop air-conditioning units are working at peak performance. The easy-to-install system measures conditions such as air intake, temperatures and thermostat control commands and allows building managers to monitor them remotely. Rather than requiring a technician to climb on the roof, open the air-conditioning unit and take the measurements by hand, this information is recorded automatically and posted on a web page in real-time. This technology also could be useful in monitoring chillers, boilers and substations. For more about the rooftop diagnostician, see <http://www.pnl.gov/breakthroughs/fall01/special4.html#aircond>.

## UW graduate students develop business plan for PNNL technology

Four students from the University of Washington—two working on Master's of Business Administration degrees, one completing a Ph.D. in bioengineering and an attorney returning for a master's degree in law with a focus on intellectual property—developed a business plan to launch a new venture around a technology developed at Pacific Northwest National Laboratory.

The project was the first resulting from PNNL's collaboration with the University of Washington's Center for Technology Entrepreneurship and its New Ventures Creation Laboratory. It focused on radiogels developed at PNNL that would carry radioisotopes or other chemotherapy drugs to tumor sites to treat cancer. See <http://www.pnl.gov/news/2001/01-10.htm>.

At a Dec. 14 reception honoring the students, Laboratory Director Lura Powell said that PNNL's partnership with the Center for Technology Entrepreneurship and the New Ventures Creation Laboratory was a match made in heaven. "The Center is looking for opportunities for students to become immersed in real-time, 'live-fire' entrepreneurial activities. We are looking for opportunities to create significant value from our technology by moving it out of the laboratory and into practical application," she said. PNNL is on the Center's advisory board along with leading industrialists, venture capitalists and successful entrepreneurs from the Northwest.



*PNNL's polymer gels that start as liquids and turn to solids when subjected to body heat may be used in targeted cancer treatment.*

## Regional collaborations strengthened by high-speed connections

Pacific Northwest National Laboratory expanded its network connectivity this fall by connecting to a regional data transfer center—called a Gigapop—that efficiently moves large volumes of data between regional and national networks. The Pacific Northwest Gigapop (PNWG) allows direct and efficient high-bandwidth access among PNNL and the other major research entities in the region including the University of Washington, Oregon Health Sciences Center, and the universities of Alaska, Montana, Idaho and Montana State.

"Now, more than ever, high performance network connections are essential tools to the success in our research," said Ray Bair, PNNL's associate director of Computational Sciences and Mathematics. PNNL's OC-3 connection into the PNWG allows data to move at 155 million bits per second, which will help PNNL staff work more closely with collaborators and provide collaborators with better access to computing and data resources at the Laboratory. In addition, the connection is crucial to the success of the Cell Signaling agreement signed by the University of Washington and PNNL which focuses on providing high bandwidth, online collaboration tools and resources to cell biology researchers nationwide.

## PNNL co-hosts principals' science education symposium



*Symposium participants try their hand at "hands-on" science*

Elementary and middle school principals and school district administrators from Ellensburg to Walla Walla, Wash., were invited to the Tri-Cities on Nov. 2 for a symposium on elementary and middle school science. The symposium was aimed at reviewing characteristics of effective inquiry-centered science teaching and learning, communicating research on the effects of a hands-on, inquiry-centered science program on student achievement and literacy, and identifying effective strategies for implementing a quality science program.

The symposium was sponsored by the Washington State Leadership and Assistance for Science Education Reform (LASER) Project and hosted by Pacific Northwest National Laboratory, Education Service District 105 and Washington State University Tri-Cities.

LASER is a statewide effort to help school districts initiate, implement and sustain quality science education programs aligned with Washington's Essential Academic Learning Requirements in Science. PNNL and Battelle, which operates the Laboratory; the Pacific Science Center; the Office of the Superintendent of Public Instruction and the National Science Resources Center lead this initiative. For more, see <http://www.pnl.gov/educationk20/laserbrief.stm>.

### For more information about these items or about Pacific Northwest National Laboratory, contact:

Pamela Harrington, Editor  
Phone: 509-375-4506  
Fax: 509-375-6550  
E-mail: [pamela.harrington@pnl.gov](mailto:pamela.harrington@pnl.gov)

Pacific Northwest National Laboratory  
P.O. Box 999, K1-39, Richland, WA 99352  
Toll-free: 1-888-375-PNNL  
Web address: <http://www.pnl.gov>

