

# Four PNNL Innovative Technologies Honored With the 'Oscars of Technology'

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Pacific Northwest National Laboratory has been honored with three Research and Development 100 Awards for 2004, while four additional PNNL researchers share an Research and Development 100 Award with Battelle for their work on a Battelle-funded project.

"PNNL has won a total of 66 Research and Development 100 Awards since the contest's inception in 1963, 59 of them since 1988. The awards represent the world's 100 most important scientific and technical innovations, according to Research and Development Magazine, and are considered the "Oscars® of technology."

The Department of Energy laboratory was honored for the following innovative technologies:

**The Millimeter Wave Holographic Body Scanner for Custom Fitting Apparel** is a patented novel holographic imager that creates a 360-degree high-resolution 3-D scan of a body in less than 10 seconds. Intellifit Corporation in Philadelphia has licensed the technology to create a scanner that uses the PNNL-developed technology to illuminate the fully clothed human body and create a true measurement of the body.

By creating accurate measurements of consumers, Intellifit allows designers to understand their customers' shapes, sizes and proportions, and intends to help manufacturers worldwide create better fitting off-the-rack clothing as well as custom-fit apparel. The technology has the

potential to minimize product markdown, alterations and returns, which represent over \$150 billion annually for the U.S. apparel market. The harmless millimeter waves penetrate clothing and reflect off the body, sending signals back to a transceiver. The signal is then sent to a high-speed computer, which creates a high-resolution image of the body.

Millimeter wave holographic scanning and imaging technology also has the potential for use in security applications. Safeview, Inc. of Santa Clara, Calif., has commercialized the technology for use in security applications in aviation, prisons, government and commercial buildings, and border crossings. The technology can quickly show the presence of non-metallic threats such as plastic and ceramic weapons as well as metal objects, and can minimize the need for personal body searches.

**BSP3 Polymer**, a unique polymer coating, can be used in chemical detector systems to detect airborne chemical agents, such as nerve agents, that might be used in terrorist attacks. BSP3 coats the surface of a sensor chip in the detector and absorbs vapor molecules from the air for the sensor to detect. Compared it to its predecessor, BSP3 made sensors four times more sensitive to nerve agents and in some systems has enabled faster detection at lower concentrations than was previously possible. Sensors with this coating could be used to monitor air quality in subways and buildings, and to protect first responders at terrorist or chemical incidents.

**The Single-Chain Antibody Library** provides researchers with a user-friendly expandable library of over one-billion artificial antibodies. These are produced from brewer's yeast and offer an inexpensive method for creating antibodies for medical and biological research. Antibodies are used in cancer therapy to seek out specific proteins in cancerous cells and direct therapy to those cells, and can be used in biowarfare sensors to detect proteins of harmful agents. The Single-Chain Antibody Library could replace the current practice of using

animals to produce antibodies and could tailor medical treatments more accurately to an individual's immune system.

The Department of Homeland Security has provided funding for the application of the library to security technologies. PNNL's Michael Feldhaus, one of the creators of the antibody library, says "The library is recognized as a valuable tool to the Department of Homeland Security for the detection of antibodies in bioterrorism weapons and to the National Cancer Institute for bio-marker development."

Four PNNL researchers shared an R&D 100 award with Battelle for their work on the following:

**D3: Degradable by Design Deicer™**, a series of products jointly developed by Battelle and PNNL, is composed of a family of non-toxic, biodegradable fluids used to remove and prevent the formation of ice on military and commercial aircraft and runways, and on roadways or pavement. The D3 is made from biobased materials, has less environmental impact, is much less corrosive and is less toxic than existing fluid and solid deicers.

R&D 100 Awards honor the most promising new products, processes, materials or software developed throughout the world and put on the market the previous year. Awards are based on each achievement's technical significance, uniqueness and usefulness. The winning inventors will be recognized in October at R&D Magazine's 42nd annual awards banquet held in Chicago, where the magazine is based.

More information on each technology can be found at [www.sysbio.org/dataresources/singlechain.stm](http://www.sysbio.org/dataresources/singlechain.stm) for the Single Chain Antibody Library; [www.intellifit.com/site/index2.html](http://www.intellifit.com/site/index2.html) or [availabletechnologies.pnl.gov/securityelectronics/bodydescription.stm](http://availabletechnologies.pnl.gov/securityelectronics/bodydescription.stm) for the Intellifit system; [availabletechnologies.pnl.gov/.../emmaterials/chem.stm](http://availabletechnologies.pnl.gov/.../emmaterials/chem.stm) for information

on the BSP3 polymer; and

[www.pnl.gov/breakthroughs/summer03/ataglance.stm](http://www.pnl.gov/breakthroughs/summer03/ataglance.stm) for information on the D3: Degradable by Design Deicer. Information on these and previous PNNL R&D 100 Awards can be found at [www.pnl.gov/main/welcome/awards/rd100/index.html](http://www.pnl.gov/main/welcome/awards/rd100/index.html).

Business inquiries on these and other PNNL technologies should be directed to 1-888-375-PNNL or e-mail: [inquiry@pnl.gov](mailto:inquiry@pnl.gov).

PNNL ([www.pnl.gov](http://www.pnl.gov)) is a DOE Office of Science laboratory that solves complex problems in energy, national security, the environment and life sciences by advancing the understanding of physics, chemistry, biology and computation. PNNL employs 3,800, has a \$600 million annual budget and has been managed by Ohio-based Battelle since the lab's inception in 1965.

Source: [Pacific Northwest National Laboratory](#)

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