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Breast fluid a better option for detecting cancer

A new method of extracting and analyzing fluid from a woman's breast may provide a more accurate, less expensive and noninvasive way to determine a patient's risk for breast cancer or to diagnose the disease in its early stages.

Battelle scientists at Pacific Northwest National Laboratory and researchers at the University of California Los Angeles have discovered six times more proteins than previously identified in nipple aspirate fluid or NAF.

When cancerous cells develop, they create their own proteins that, if detected in NAF, could indicate the presence or risk of breast cancer. Current methods for screening include breast self-exams and mammograms, which are physical exams compared with the molecular approach at PNNL. Researchers believe that, with further analysis, they can detect up to 10 times more proteins in NAF. For more information see **http://www.pnl.gov/news/2003/03-24.htm**.

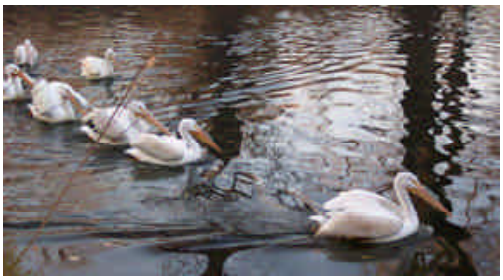
Space biology program explores life on Mars

Three scientists from Pacific Northwest National Laboratory are part of a "lead team" for the National Aeronautics and Space Administration's new Astrobiology Institute. Lead teams are research institutes working on projects related to the search for life beyond Earth.

Based at Indiana University Bloomington, the Indiana-Princeton-Tennessee Astrobiology Institute (IPTAI) involves 18 scientists from eight research institutions. IPTAI's project will employ field and laboratory experiments as well as biological samples taken from deep inside mines to determine the best of way of detecting life on the two planets. As yet, no life has been detected on or under the surface of Mars, where the average high temperature is about 50 degrees below zero Fahrenheit.

In addition to Indiana University and PNNL, scientists from Princeton University, the University of Tennessee at Knoxville, Lawrence Berkeley National Laboratory, Oak Ridge National Laboratory, the University of Toronto, and the Universities Space Research Association's Lunar Planetary Institute comprise the IPTAI team. For more information on the NASA Astrobiology Institute see **http://nai.arc.nasa.gov/**.

Scientists study pelican feeding habits at McNary Dam



Radio-frequency tagging technology developed at Pacific Northwest National Laboratory is being used to monitor the eating habits and behavior of American White Pelicans living on the Columbia River near the McNary Dam spillway in Umatilla, Oregon.

Wildlife biologists believe the pelicans are consuming millions of young salmon that become disoriented while traveling through the outflow of the dam's diversion spillway. The PNNL-Army Corps of Engineers study aims to find out how many juvenile salmon are being eaten by pelicans. Researchers are tagging pelicans' wings with bright markers for easy observation and gluing radio-frequency tags to their bills. Sensors in the RF tags record the movements a pelican makes when feeding and transmit that data to the scientists. After two to three weeks, the tag harmlessly fall off the bird. RF tags were developed at PNNL originally for the military.

Sea salt findings may aid climate modeling efforts

A new study has revealed that wind-blown sea salt particles drifting into the atmosphere participate in a chemical reaction that may have impacts on climate and acid rain.

The study by scientists at Pacific Northwest National Laboratory and the University of California Irvine indicates that sea salt plays an important role — but one previously not well understood — in the chemistry of sulfur in the atmosphere. Sulfur dioxide, a byproduct of burning fossil fuels containing sulfur, is also formed when naturally emitted sulfur-containing compounds react in the atmosphere. In the air, sulfur dioxide is converted to sulfuric acid, a major component of acid rain and a contributor to haze in the atmosphere. These haze particles can affect clouds, which play an important role in climate.

The PNNL-UCI study shows that sea salt particles will absorb more sulfur dioxide and convert it to sulfuric acid more rapidly than previously thought. This new understanding will allow scientists to better predict and capture that information in models used to predict climate change. For more information see **http://www.pnl.gov/news/2003/03-23.htm**.

HP donates home for Microproducts Breakthrough Institute

Hewlett-Packard's donation of a 3-5 year lease of laboratory and office space near Oregon State University will take the Microproducts Breakthrough Institute from virtual to reality three years sooner than co-director Landis Kannberg, Pacific Northwest National Laboratory, expected. "When we hosted the 'virtual groundbreaking' in January (2003), we predicted we'd have a bricks and mortar facility in three years," said Kannberg. "This gives us tremendous momentum to reach our goal of a $20 million business for the MBI by 2006."

The Microproducts Breakthrough Institute will have laboratory, assembly and project capabilities co-located with OSU researchers in the HP facility, along with other businesses. "Co-location with private industry will be critical for us to take the microtechnologies we are developing and move them to commercial products," said Kannberg.

The Microproducts Breakthrough Institute is a formal collaboration of PNNL and OSU. For more information, contact Kathryn Lang at **kathryn.lang@pnl.gov**.

PNNL wins three R&D 100 awards

Starlight Information Visualization System

Three Pacific Northwest National Laboratory inventions have been ranked among the world's 100 most important scientific and technical innovations for 2003 according to an annual competition by *R&D Magazine*. This brings the Laboratory's R&D 100 Awards total to 62 since the contest's inception in 1969, 55 of them since 1988.

PNNL was recognized for

- PASS, a handheld tool that enlists ultrasound pulses to assay the contents of sealed containers without having to open them. For more information see **http://www.pnl.gov/main/highlights/aid.html**.
- Starlight, an information visualization system—software that graphically depicts connections among disparate pieces of information from large, complex and dynamic collections. See **http://starlight.pnl.gov/** for more information.
- FT-MS Proteome Express, an instrument that may trim years off the time required to analyze a proteome or the entire protein set of an organism. For more information see **http://www.pnl.gov/news/2002/02-25.htm**.

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