

NewsLetter

Week of May 21, 2007

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~~A mighty microbe takes center stage~~

by ~~Todd Hanson~~

~~This month, a tiny, somewhat nondescript, microbe has been the center of attention in the Bioscience (B) Division. The reason? Bioscience scientists and technicians on the Sequencing Technology Team working as part of the Department of Energy's Joint Genome Institute recently finished the genetic code of *Shewanella baltica* OS185 as its 100th genomic sequence. Finishing a genome is the process of finding and eliminating any gaps in sections of genetic code that were not initially sequenced correctly by automated sequencing methods.~~

~~"We are celebrating the finishing of *S. baltica* as a milestone for a couple reasons," said Chris Detter, leader of the JGI Sequencing Technology Team. "Not only is it our 100th completed genomic sequence, but it's also an appropriate genome to have because of the potential it shows for use in confining and cleaning up uranium-contaminated areas, such as at the Laboratory's legacy waste sites. *Shewanella* might someday be put to work right here at Los Alamos for the bioremediation of uranium contamination at nuclear waste sites because of its unique abilities."~~

~~*Shewanella baltica* OS185 is a tiny, ocean-dwelling microbe that can replicate and grow almost anywhere. Taken from the depths of the Baltic Sea, the *S. baltica* microbe has a unique ability, among other things, to convert uranium dissolved in groundwater into an insoluble form called uranium dioxide, or uraninite, which prevents the uranium from mixing with water and from migrating into and with groundwater flows. Under anaerobic conditions it has the ability to "digest" certain kinds of radioactive materials. While solid in most forms, uranium can break down over time in the natural environment leading to the possible contamination of groundwater.~~

~~"I could not be more proud of the outstanding work that the finishing team has done over the years," said Gary Resnick, B Division leader. "They have worked tirelessly in supporting the Department of Energy JGI mission and brought a~~

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Americium-241 sources in a "bird feeder" style container that holds the sources.

NNSA/Lab team recovers 15,000th radioactive source

by Nancy Ambrosiano

With the arrival of a shipment to Los Alamos, a landmark 15,000th radioactive item was recovered from an urban area, logged in, and secured safely away from potential misuse. The source was recovered by a Laboratory Off-site Source Recovery Project team representing the National Nuclear Security Administration. For eight years, OSRP staff have traveled the country, collecting thousands of radioactive sources from warehouses, tool sheds, schools, and offices where they are no longer needed for industry or research.

OSRP was initiated by the Department of Energy in 1999 as an environmental management project to recover and dispose of excess and unwanted sealed radioactive sources. The project was transferred in 2003 to the Office of Global Threat Reduction (known as NA-21) of DOE's National Nuclear Security Administration.

The 15,000th source came from an industrial-gauge manufacturer near Los Angeles that had used the measurement device to measure plastic and paper thickness during production, one of 306 unwanted sealed sources containing Americium at this one location. The sources, small tungsten-shielded, teardrop-shaped items, each contain about 150 millicuries of Americium-241. The OSRP team verified and packaged the sources, then loaded them into a special drum for shipment to Los Alamos, where they are stored prior to approval of the drum for disposition at DOE's Waste Isolation Pilot Plant southeast of Carlsbad, New Mexico.

Radioactive sealed sources packaged by NNSA's OSRP include more than 15,000 curies of Americium-241, 10,000 curies of Plutonium-238, and 10,000 grams of Plutonium-239, collected from more than 600 sites. The sealed sources were once used in applications ranging from nuclear-powered cardiac pacemakers to gauges used in the manufacture of paper.

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LANS awards outreach funds

Laboratory Director Michael Anastasio talks with New Mexico Highlands University President Jim Fries, right, and Tom Garcia, executive vice president for Northern New Mexico College, at the regional community leaders breakfast May 16 in Pojoaque. Fries and Garcia received symbolic checks for \$100,000 from Los Alamos National Security, LLC, for educational investment programs. Education, community giving, and economic development are the three pillars of the LANS community commitment plan. Three businesses also received checks for economic development programs. The Laboratory's Community Programs Office coordinates the quarterly breakfast. Photo by LeRoy N. Sanchez, Records Management/Media Services and Operations



And the award goes to....

by Kathy DeLucas

More than 300 outstanding researchers were recognized by the Technology Transfer (TT) Division during an awards celebration at Fuller Lodge.

"Laboratory employees have demonstrated their amazing abilities in solving complex problems and partnering with industry leading to new technology products," said Technology Transfer Division Leader Duncan McBranch. "This event highlights their dedication and the value of ideas and inventions."

In fiscal year 2006, the Laboratory produced a record 142 invention disclosures. Laboratory patent attorneys submitted 92 patent application filings. Laboratory researchers received 32 patents overall.

The Distinguished Patent Award this year was presented to Laboratory researcher David Reager of the Superconductivity Technology Center (MPA-STC) and former Laboratory employee Jose Vasques Dominguez for their "through the earth radio" patent. The underground radio uses very low frequency electromagnetic radiation, a superconducting quantum interference device for signal reception, and digital audio compression to transmit voice and data signals. Once produced, this device can be used to solve major communication problems in mining and urban settings in which traditional radio waves don't work.

The Distinguished Copyright Award went to Chung-Hsing Hsu of the Computer, Computational, and Statistical Sciences (CCS) Division and former Laboratory employee Wu Chun Feng for their copyright of the software called "Energy Fit." Energy Fit monitors high-performance computing systems by modifying the voltage to minimize energy use. Energy Fit can help mitigate very serious data center heat and power consumption problems.

The Laboratory's Licensing Program generated \$1.36 million through 88 licenses and 165 inventors during fiscal year 2006. Licensing a Laboratory technology is the granting of rights to commercial and noncommercial entities to patents and copyrights.

Kevin Ott of Materials Chemistry (MPA-MC) received the Distinguished Licensing Award for his selective catalytic reduction catalyst that can be used to reduce levels of nitrogen oxides in exhaust systems. Ott's research resulted in 19 new invention disclosures, 13 of which became patent applications. The research is directed at providing possible technical solutions to the nation's energy security problems.

The Muon Tomography team won the newly created Programmatic Impact Award for developing an advanced three-dimensional tomography technology that will

allow inspection of large objects using natural solar and cosmic rays in the atmosphere.

The award recognized teams that have made significant advancements to the programmatic mission of the Laboratory through their interactions with industry partners. Programmatic agreements in the form of cooperative research and development agreements, non-federal work for others, and user facility agreements brought in \$18 million for a wide variety of Laboratory activities.

The ceremony also recognized for the first time organizations, programs, or individuals that have made a significant contribution to the Northern New Mexico economy by creating new jobs or products. The award was given to CleanAir Systems Inc. of Santa Fe and to Ott.

Ott's NOx HyCat technology could enable the country to switch from inefficient gasoline vehicles to more efficient diesel-powered vehicles. CleanAIR systems was awarded an exclusive license option for the NOx HyCat technology producing emissions control systems for on and off road vehicles, machinery, and generators. The company is a clean industry that manufactures its products locally.

NNSA/Lab team ...

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"The OSRP has achieved the goal of providing an end-of-life disposition pathway for the sealed-source life cycle in the United States, including sources for which no disposal pathway previously existed," said Project Leader Julia Whitworth of Nuclear Nonproliferation (NN). "The team's efforts guarantee continued medical and other beneficial uses of sealed sources but solve the disposition problem of unwanted sources for future generations."

In 2006, under the guidance of NA-21, OSRP also began recovering unwanted or unused sealed sources of U.S.-origin distributed overseas. The team has so far repatriated U.S.-origin radioactive sources from Africa, Australia, and Uruguay with more international and domestic sites planned for this year. Other recent accomplishments include obtaining international authorization for use of its S300 shipping container and field-sealable special form capsules, as well as initiating a cooperative effort with Chinese authorities in support of the 2008 Beijing Olympics.



Kevin Ott of Materials Chemistry talks with Joe Vick, right, and Michael Tripodi, left, both of CleanAIR Systems Inc., at Fuller Lodge. Ott and CleanAIR Systems Inc. were recognized at the Technology Transfer Awards reception for making a significant contribution to the Northern New Mexico economy by creating new jobs or products. Photo by Richard Robinson, Records Management/Media Services and Operations