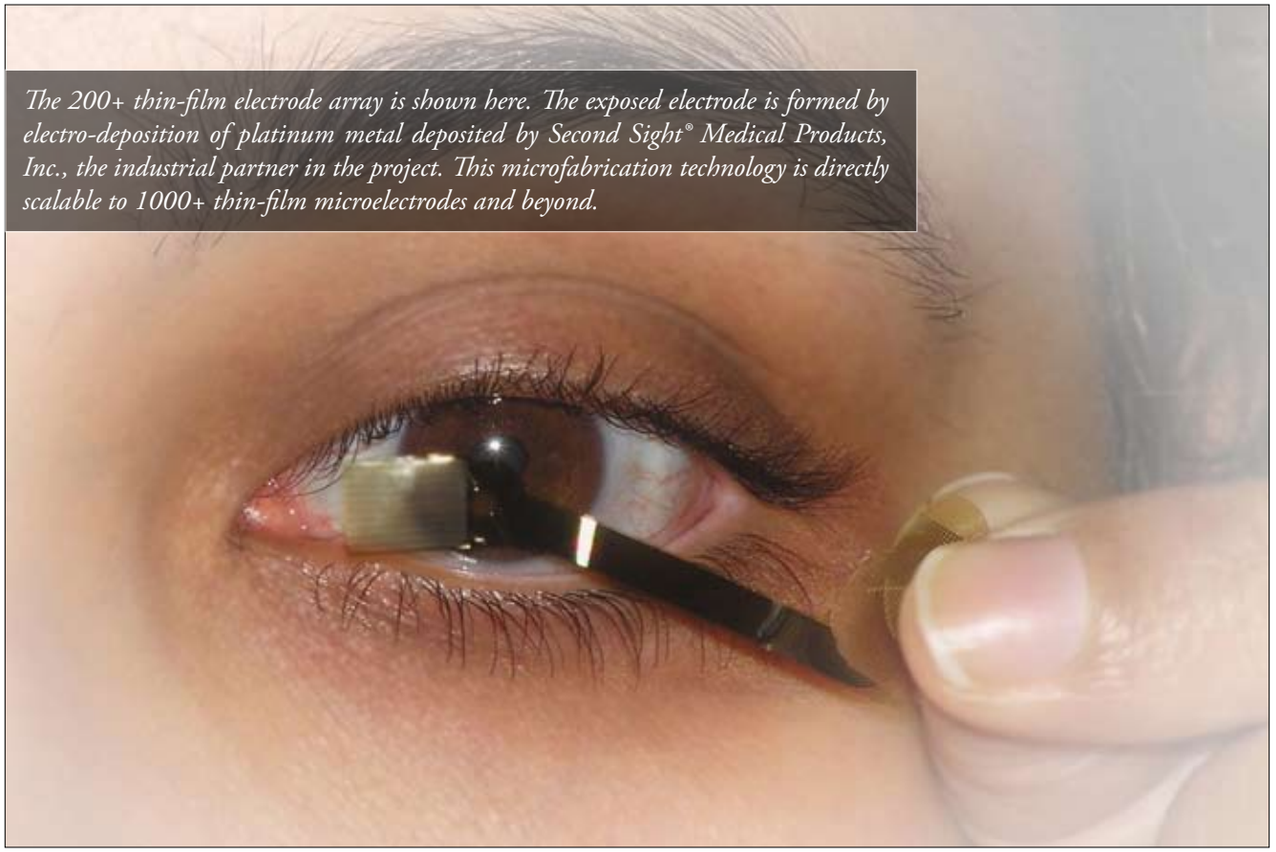
Livermore, Los Alamos Team for Artificial Retina Project to Help Restore Vision for Many



The 200+ thin-film electrode array is shown here. The exposed electrode is formed by electro-deposition of platinum metal deposited by Second Sight® Medical Products, Inc., the industrial partner in the project. This microfabrication technology is directly scalable to 1000+ thin-film microelectrodes and beyond.

Millions of people worldwide suffer from ocular diseases that degrade the retina, the light-processing component of the eye, causing blindness. As the population continues to age, the number of Americans blinded by age-related macular degeneration (AMD) and retinitis pigmentosa (RP) will increase. A retinal prosthesis can be used to treat AMD as well as inherited retinal disorders such as RP. In collaboration with four other national laboratories, four universities, and one industrial partner, Lawrence Livermore National Laboratory is leading this 2009 R&D 100 award-winning effort to develop the first long-term retinal prosthesis that can function for years inside the harsh biological environment of the eye.

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Coupled experimental studies and computer simulations are being used to investigate the biophysical and physiological properties of retinal neuronal tissue. In clinical trials, patients with vision loss were able to successfully identify objects, increase mobility, and detect movement using the Artificial Retina.

Further planned developments for the device will enable reading and face recognition. In addition, the technologies used in the Artificial Retina to restore sight to the blind could be expanded to develop devices that increase the functionality of people with spinal cord injuries, deafness, and other neurological disorders. The team also explores advanced concepts for electroneural interface design and fabrication, and novel strategies for high spatial resolution stimulation.

Established through a Department of Energy CRADA in 2004, the mission of the Artificial Retina team is to develop the world's most advanced high-density microelectronic-tissue interface suitable for sensory and motor prosthesis and therapeutic stimulation applications. The R&D of such a long-term interface challenges the limits of engineering, physics, chemistry, and biology. The successful integration of these profoundly different elements (biological tissue versus electronic and mechanical systems) has the potential to usher in a new era of sensors and actuators not only for biomedical applications, but also for a wide range of hybrid surveillance systems, including environmental sensors, and for plant and bacteria studies.

The project team consists of five national laboratories: Argonne, Lawrence Livermore, Los Alamos, Oak Ridge, and Sandia; four universities: California Institute of Technology, Doheny Eye Institute at the Keck School of Medicine within the University of Southern California, North Carolina State University, and the University of California at Santa Cruz; and industrial partner Second Sight® Medical Products, Inc., the group responsible for commercializing the product.

For additional information related to Los Alamos' role in this project, contact John George, 505-665-2550, jsg@lanl.gov.

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The article on the previous page was taken from the September 2009 issue of

FLC NewsLink

The Newsletter of the Federal Laboratory Consortium for Technology Transfer

The entire September 2009 issue follows.

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T2 EVENTS

PDS 100: Commercializing Technology Through the Power of IP
Philadelphia, Pa.
November 2, 2009

•

2009 Maryland SBIR Conference
Greenbelt, Md.
November 17, 2009

•

ISPIM Innovation Symposium
New York, N.Y.
December 6-9, 2009

•

SPIE Defense, Security, and Sensing 2010
Orlando, Fla.
April 5-9, 2010

•

FLC National Meeting
Albuquerque, N.M.
April 26-29, 2010

T2 FACT

Beginning in 1987, Rudolf Gunnerman researched and developed water-based fuels. Gunnerman invented an emulsifier additive that allowed for the creation of fuel mixtures of alcohol and water, gasoline and water, diesel fuel and water, and water and naphtha. He trademarked his fuels under the name of A-55 Clean Fuels. He is the founder CEO of SulphCo, Inc., a trustee of the DRI Research Foundation, and sponsor of the $25,000 Gunnerman Silver State Award for Excellence in Science and Technology.

- Mary Bellis, About.com

Pathogen Problem
Aquatic pathologist Joyce Evans prepares a dose of human group B Streptococcus (GBS) to be injected into tilapia.

FLC NEWSLINK
September 2009
The Newsletter of the Federal Laboratory Consortium for Technology Transfer

Genetic Research Sheds Light on Group B Streptococcus

by Laura McGinnis, ARS Information Staff

A versatile pathogen that affects a variety of animals, *Streptococcus agalactiae* has a family tree that might have baffled Darwin himself. Fortunately, new research from the Agricultural Research Service (ARS) is shedding light on the relatedness of subtypes of the bacteria that affect different animals.

Probably best known for causing mastitis in cattle and neonatal meningitis in humans, *S. agalactiae* (also called group B Streptococcus, or GBS) has also been known to infect reptiles, amphibians, and fish. The symptoms of GBS, a relative of the group A Streptococcus species that causes strep throat in humans, vary from animal to animal.

Human adult carriers of GBS generally have no symptoms, but the bacteria can be deadly for newborns who contract it in the birth canal. In cattle, GBS is associated with mastitis—a painful udder inflammation that costs the U.S. cattle industry about $2 billion annually. In farmed and wild fish, the bacteria can cause meningoencephalitis, which is accompanied by swimming difficulty and hemorrhaging.

There are no official records of the disease's economic impact, but ARS researchers estimate that GBS may cause significant losses for the aquaculture industry.

The bacteria have infected wild fish around the world. And incidences of GBS in farmed fish have increased in frequency

See Streptococcus, page 4

Air Force, NASA Team to Extend Life of Hubble Space Telescope Through 2014

Since 2007, Air Force Research Laboratory (AFRL) scientists and engineers on Maui have captured images of the Hubble Space Telescope for the National Aeronautics and Space Administration (NASA) in preparation for the recently completed Servicing Mission 4.

This was the final servicing mission where the astronauts repaired everything necessary to extend the satellite's life at least through 2014 to include installing updated cameras and other science equipment.

To better understand Hubble's exterior condition, NASA requested support from the Air Force Maui Optical and Supercomputing Site (AMOS) to collect highly resolved imagery utilizing the state-of-the-art telescopes available on Maui. Data packages containing still frames, movies, and presentations were delivered for NASA scientists and engineers to analyze. The highly resolved images of both the space shuttle Atlantis and the Hubble Space Telescope were processed through an AFRL-developed algorithm known as Physically Constrained Iterative Deconvolution (PCID) algorithm, allowing as much detail extraction as possible.

The shuttle astronauts viewed the current imagery of Hubble prior to their launch into

See Hubble, page 5

NIH Awards Sandia's Timlin for Protein Research

Jerilyn Timlin, a chemist at Sandia National Laboratories, has been presented by the National Institutes of Health (NIH) with a New Innovator Award, one of 55 such awards granted by the NIH this year.

The award encourages researchers to explore bold ideas that have the potential to catapult fields forward and speed the translation of research into improved health.

Timlin received the award for her project, "Multiplexed measurements of protein

See Timlin, page 8

Fed Labs Flash | *News From Around the Consortium*

President Obama to Nominate Gallagher to Lead NIST

President Barack Obama recently announced his intent to nominate physicist Patrick Gallagher to be the 14th director of the U.S. Commerce Department's National Institute of Standards and Technology (NIST). Gallagher, 46, is currently the NIST deputy director.

"NIST is a unique agency with a strong culture of world-class scientific achievement," U.S. Commerce Secretary Gary Locke said. "Pat Gallagher has come up through the ranks, and his continued leadership will be critical to an agency that is central to the nation's ability to innovate and compete in global markets."

If confirmed by the Senate, Gallagher will direct an agency with an annual budget of approximately $800 million that employs approximately 2,900 scientists, engineers, technicians, support staff and administrative personnel at two primary locations: Gaithersburg, Md., and Boulder, Colo. Gallagher will succeed William Jeffrey, who left NIST in 2007.

Though perhaps most widely known as the civilian provider of the nation's standard time service, NIST also conducts research in measurement science, standards, and related technologies spanning all physical sciences, engineering and information technology.

The agency also is home to the Hollings Manufacturing Extension Partnership, a nationwide network of local centers offering technical and business assistance to smaller manufacturers; the Technology Innovation Program, which provides cost-shared awards to industry, universities and consortia for research on potentially revolutionary technologies that address critical national and societal needs; and the Baldrige National Quality Program, which promotes performance excellence among U.S. manufacturers, service companies, educational institutions, health care providers and nonprofit organizations.

Gallagher, who has a doctorate in physics from the University of Pittsburgh, came to the NIST Center for Neutron Research (NCNR) in 1993 to pursue research in neutron and X-ray instrumentation and studies of soft-condensed matter systems such as liquids, polymers and gels.

In 2000, Gallagher was a NIST agency representative at the National Science and Technology Council (NSTC) and became active in U.S. policy for scientific user facilities. In 2006, he was awarded a Department of Commerce Gold Medal, the department's highest award, in recognition of this work. In 2004, he became director of the NCNR, a national user facility for neutron research that is considered one of the most productive and heavily used facilities of its type in the nation. In September 2008, he was appointed deputy director of NIST.

Gallagher is active in a variety of professional organizations and is a member of the American Association for the Advancement of Science.

Founded in 1901, NIST is a nonregulatory agency of the Commerce Department that promotes U.S. innovation and industrial competitiveness by advancing measurement science, standards and technology in ways that enhance economic security and improve our quality of life.

Army Lab Promotes Science to Students

Hundreds of middle and high school students were exposed to world-class laboratories and scientific experiments this summer during the U.S Army Research Laboratory's (ARL) Gains in the Advancement of Mathematics and Science (GEMS) programs.

Every year ARL opens its doors at Aberdeen Proving Ground and Adelphi, Md., as well as at White Sands Missile Range (WSMR), N.M., for students to attend the GEMS science camp.

With WSMR hosting about 30 students, Adelphi having about 100 during five one-week sessions, and APG welcoming about 130 kids during its four one-week sessions, ARL educated more than 250 kids in math and science.

"It's a whole week of hands-on action," said Dr. Sandy Young, a researcher at ARL's Weapons and Materials Research Directorate and APG's GEMS program director.

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Tech Watch | *Laboratory Techs Ready for Transfer*

Manufacturing Citrus Limonoids

Agricultural Research Service (ARS) researchers Andrew Breksa and Gary Manners in California have developed a method for manufacturing pure limonoid compounds from citrus juice production byproducts.

Limonoid compounds are phytochemicals currently believed to have therapeutic benefits.

ARS research studies have shown that these compounds possess potential health benefits, including cancer prevention and cholesterol reduction. Although other methods exist for extracting limonoids from citrus byproducts, ARS's technology has an advantage over existing methods in that it allows for extracting more pure compounds needed for producing nutraceutical and functional foods.

Another benefit of ARS's technology is that it uses "food-grade" solvents, reducing the risks associated with toxic solvents. ARS researchers are currently seeking a cooperative research partner for commercial scale-up of this technology to ultimately produce consumer products made with these compounds. ARS-directed human studies are underway to establish the cholesterol lowering properties of various citrus limonoid species.

Companies that manufacture nutraceuticals, phytochemicals or health directed functional foods would be able to use this technology for producing commercial products.

No Food and Drug Administration approval would be required for food applications targeting cholesterol reduction.

More info: www.ars.usda.gov

NASA GPS Technology

NASA has invented a new GPS receiver for implementation in radiation-hardened, space-ready hardware. The receiver has capabilities lacking in all other current commercial space-borne GPS receivers. Namely, PiVoT 2.0 can acquire GPS signals in a fraction of the time taken by these other receivers.

This capability that arises from the use of dedicated signals also leads to the ability to process/track weak GPS signals, which are unusable to most current technology receivers. This weak signal capability opens the door to a host of new applications for GPS.

More info: http://technology.nasa.gov/

DOD's Bioremediation Tool Kit

In situ anaerobic biodegradation (ISAB) technologies are being implemented at many contaminated groundwater sites to stimulate anaerobic bioremediation.

At some sites, ISAB is highly successful and can result in substantial reductions in contaminant concentration and mass, but at many sites, poor delivery of the chemical reagent or amendment can stifle effectiveness.

A new spreadsheet-based design tool, developed under the Environmental Security Technology Certification Program (ESTCP), a Department of Defense program that promotes innovative, cost-effective environmental technologies through demonstration and validation at DOD sites, will aid remediation engineers in designing effective, reasonably efficient systems for distributing emulsified oil to promote bioremediation. The design tool uses site data and injection costs to select appropriate substrate quantities and injection well spacing. The user must also determine if barrier treatment or area treatment is appropriate.

The model then uses this information to evaluate the costs of various designs using different well spacing. Results of the complete analysis are given in terms of total fixed cost, dollars per injection point, injection rate, and injection costs per day. Similar design tools for distributing soluble substrates in ISAB systems and permanganate in ISCO systems are being developed and are anticipated to be released in 2010.

The Emulsion Design Tool Kit is available at www.estcp.org/_cs_upload/ER-0626-ToolKit.

FLC Technology Locator

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Streptococcus, from page 1

since the bacteria were first observed in U.S. hatcheries in 1966, prompting researchers to investigate how fish contract the disease and pass it on.

Can the disease be spread from one host species to another? Which types of GBS infect multiple species? To address these questions and learn more about the emergence and transmission of GBS, scientists with the Aquatic Animal Health Research Unit in Auburn, Alabama, and Chestertown, Maryland, compared GBS samples, or "isolates," collected from a variety of infected animals around the world.

"Understanding the global distribution, host susceptibility, and genetic relatedness of GBS isolates is essential for understanding GBS disease in fish and marine mammals," said aquatic pathologist Joyce Evans, who led the study.

With ARS research leader Phillip Klesius, professor John Bohnsack of the University of Utah, and professor Shinji Takahashi of Japan's Joshi-Eiyoh University, Evans gathered GBS isolates from several fish species in the United States, Latin America, and the Middle East; a bottlenose dolphin in Kuwait; humans and cattle in North America; and humans in Japan.

The scientists used a technique known as multilocus sequence typing (MLST) to examine similarities and differences between the genes of the GBS isolates.

This was the first study to apply the technology to GBS isolates from aquatic animals and to compare those isolates to human and bovine GBS isolates.

"MLST is particularly suitable for epidemiological studies like this because it provides data that can easily be compared between laboratories over the World Wide Web," Evans said.

She and her colleagues have shared their GLB MLST data online at http://pubmlst.org/sagalactiae/.

Genetic Analysis Reveals Lineage Data

During characterization of the GBS isolates, the scientists discovered a previously unknown serotype in fish in isolates from Kuwait, Brazil, Israel, and the United States. "Serotypes" are closely related subdivisions of microorganisms, each of which has a unique set of antigens that distinguishes it from the others. Although this particular serotype had never before been observed in fish or dolphin GBS isolates, it had been found in some cattle and human GBS isolates.

Evans injects a Nile tilapia with human GBS while technician Daniel Brougher holds the next fish for injection.

Using MLST data, Evans and her colleagues also discovered five previously unknown sequence types that were genetically unrelated to any known GBS sequence types. Both findings are significant because they could shed light on the relatedness and potential evolutionary relationship of these particular isolates.

In a related study, the scientists also showed that a human GBS isolate—one with the same serotype and sequence type as those found in fish—is capable of causing infection in fish. In this study, Evans and Klesius exposed Nile tilapia to a human GBS isolate responsible for human neonatal infections in Japan, and observed that the fish developed disease symptoms and died. This proves that human GBS can be pathogenic to fish in a laboratory setting. But there is no proof that wild fish have been infected with GBS of human origin.

"Genetic analyses alone cannot determine whether GBS is capable of being passed from one species to another and causing disease," Klesius said. "But they can indicate whether it is a possibility."

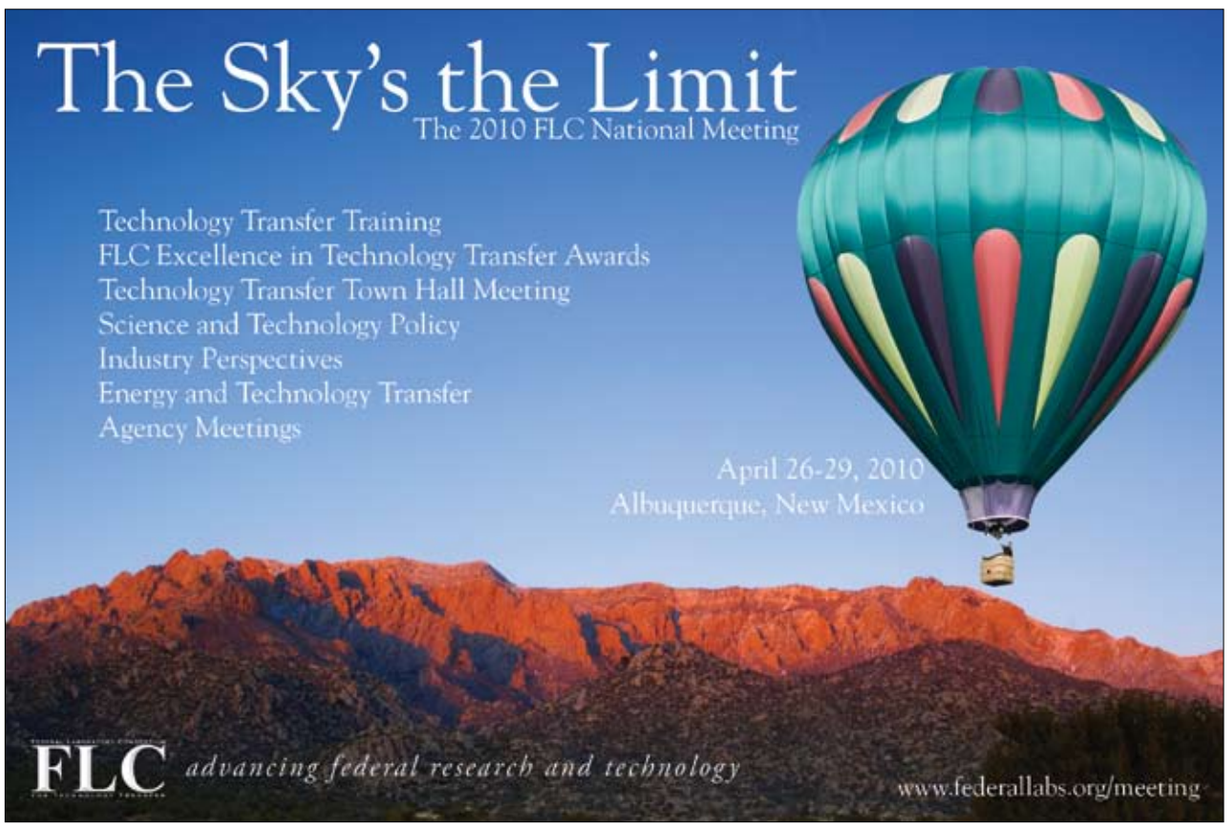
Further research is needed to determine whether human GBS isolates are capable of infecting fish in natural settings and whether other human GBS isolates can infect and kill fish.

So are fish susceptible to bovine GBS as well? That remains to be seen. In the laboratory, Evans and her colleagues exposed tilapia to bovine GBS isolates, but the fish did not develop infection symptoms.

But this does not mean that it is impossible for bovine GBS isolates to infect fish. Evans and her colleagues plan to repeat the experiment with a different serotype of the bacteria.

All of this information can be used to improve aquaculture scientists' understanding of potential sources and reservoirs of this important disease.

The data generated from these studies has been added to the GBS MLST database, where it can be used by researchers investigating human, bovine, and aquatic animal GBS.



GAO Releases Study on the Use of "March-in" Authority by Federal Agencies

by Gary Jones, FLC Washington, DC Representative

Greetings from D.C. In the second of two anticipated studies this summer on tech transfer-related activities (see my August column for a discussion of the first study), the GAO just released a report highlighting a provision in the Bayh-Dole Act—the authority given to federal agencies known as "march-in" rights—and its use among select federal agencies to promote commercialization of federally funded inventions.

The short answer is that the authority has never been used—at least not by the four agencies included in the study (DOE, DOD, NASA and NIH), which account for the vast majority of federally funded research in the U.S.

As described in "Federal Research: Information on the Government's Right to Assert Government Control Over Federally-Funded Inventions," GAO 09-742, the Bayh-Dole Act (1980) "allows recipients of federal research funds the option to retain patents on any inventions they create using those funds. At the same time, the act provides the government with rights intended to ensure that the public benefits from these federal research investments. One of these rights is known as the 'march-in' authority, which allows federal agencies to take control of a patent when they have credible information that certain conditions described in the act have been met."

In other words, the agency may "march in" and take control if they believe an inventor is not taking the necessary actions toward commercialization of federally funded technologies. Doing so would, in theory, protect the public from "non-use" of these inventions (commercialization being, of course, one of the driving forces behind federal technology transfer).

In its study, the GAO focused on four agencies that accounted for nearly 90 percent of federal research funding in 2006 (the study period): DOD, DOE, NASA and NIH. They looked at agency policies for determining if march-in authority should be exercised, how the authority was used, and what barriers or disincentives existed for implementing this authority.

GAO found that none of the four agencies studied had developed agency-specific guidelines for determining if a march-in action was warranted, and instead chose to rely on Department of Commerce regulations for Bayh-Dole in general. The agencies felt that this reserved some flexibility for their efforts when assessing the specific circumstances of each case.

GAO reported that none of the four agencies studied had ever exercised march-in authority in the nearly 30 years Bayh-Dole has been in place. Three of the agencies (DOD, DOE, NASA) had never even received information suggesting they should even initiate such an action. NIH, on the other hand, had formally looked into using the authority on three occasions, but determined in each case that the statutory requirements for exercising the authority had not been met.

Finally, four disincentives to using the authority were identified in the study. First, that it may actually deter investors from investing in the commercialization of federally funded research results; second, the time-consuming nature of the process; third, the complications surrounding multiple patents in potential commercial products (some of which may not even come from federally funded research); and fourth, the existence of specialized knowledge within the current licensee that may be lost in a march-in action.

As the FLC DC Representative, I have heard the question asked a number of times, "How often has march-in been used?" Although I had never heard of a single case, now I can respond with a little more certainty.

The GAO report can be found at http://www.gao.gov/new.items/d09742.pdf.

Gary can be reached at gkjones@federallabs.org.

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Hubble, from page 1

space, which afforded them a better understanding of what to expect once their repair mission was underway. This collaboration helped establish the mission manifest priorities important to a successful servicing operation and solidified a strong working relationship between NASA and AMOS for the future. The optical site on Maui has since contributed imagery and information for other NASA missions.

The 3.6-meter AEOS (Advanced Electro-Optical System) telescope, which is the largest optical telescope in the Department of Defense designed for tracking satellites, was used to collect imagery on Hubble throughout the mission. Gemini, the daytime imaging sensor located on the 1.6-meter telescope, obtained imagery on the space shuttle while attached to Hubble. Both telescopes are part of the Maui Space Surveillance Complex at 10,000 feet above sea level on the summit of Mount Haleakala on Maui.

The Hubble Telescope was launched April 25, 1990, to observe space and deep space in a capacity that telescopes on Earth could not achieve. This May, NASA's astronauts completed Hubble's fifth and final servicing mission. After nearly 13 days in space, the shuttle crew completed their mission and landed safely on Earth on May 24. More information on Hubble can be found at www.nasa.gov. Though the shuttle is not planned to visit the Hubble Telescope again, AMOS will continue to provide support to NASA as it carries out Hubble's ongoing mission.

AMOS includes the Maui Space Surveillance Complex (MSSC) and the Maui High Performance Computing Center (MHPCC). MSSC consists of multiple telescopes located on the top of Haleakala at an altitude of 10,000 feet, providing superior viewing conditions for research and development. MHPCC is located at sea level and houses highly powerful computer systems for the Department of Defense. More information can be found at http://www.maui.afmc.af.mil.

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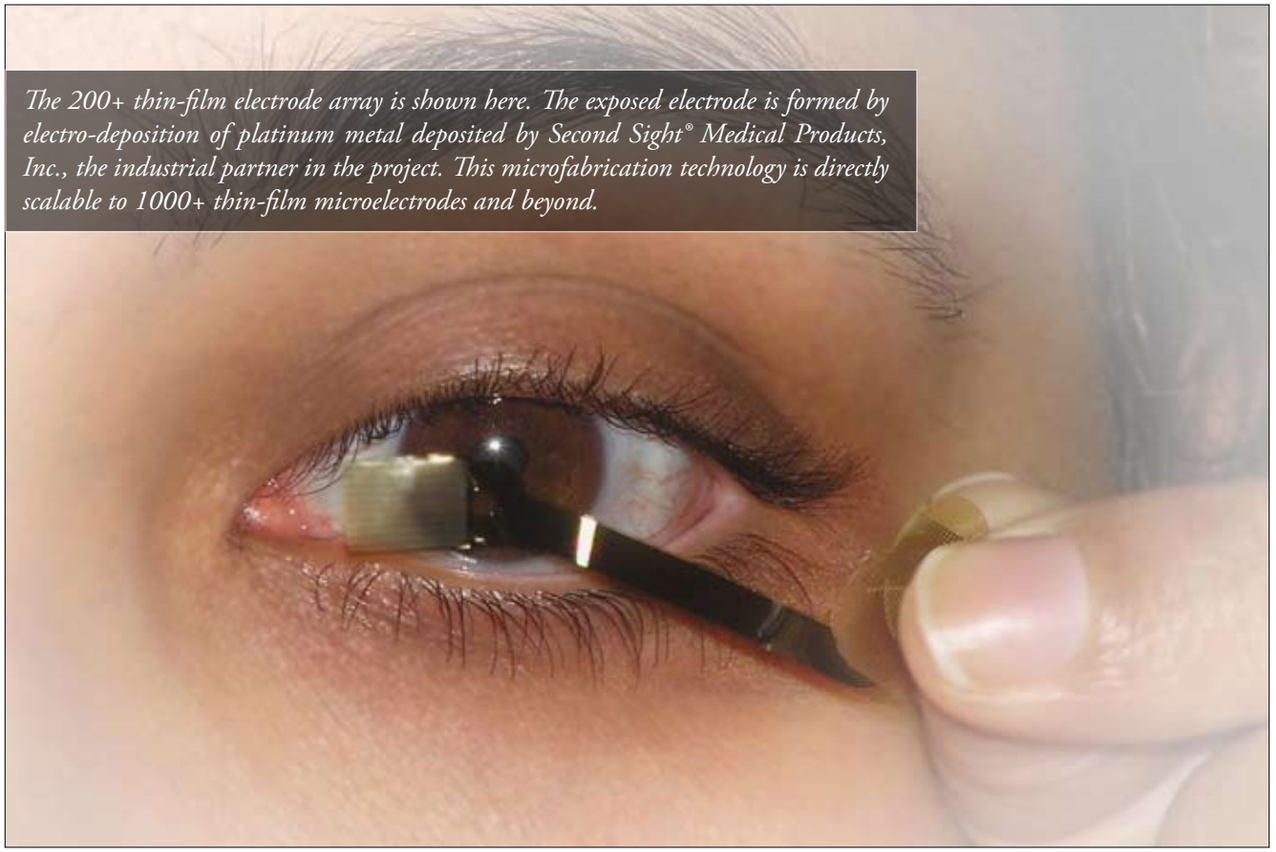
Livermore, Los Alamos Team for Artificial Retina Project to Help Restore Vision for Many



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The project team consists of five national laboratories: Argonne, Lawrence Livermore, Los Alamos, Oak Ridge, and Sandia; four universities: California Institute of Technology, Doheny Eye Institute at the Keck School of Medicine within the University of Southern California, North Carolina State University, and the University of California at Santa Cruz; and industrial partner Second Sight® Medical Products, Inc., the group responsible for commercializing the product.

For additional information related to Los Alamos' role in this project, contact John George, 505-665-2550, jsg@lanl.gov.

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Lab Classifieds | *Available Technologies, Facilities, and Partners*

Fighting Tetanus

Food and Drug Administration inventors Marjorie Shapiro, Ph.D., and Sean Fitzsimmons, Ph.D., announced as available for licensing a murine monoclonal antibody that specifically binds to Fragment C of tetanus toxin. Tetanus toxin is one of the most potent neurotoxins known. It is a complex molecule, composed of a linked heavy chain and light chain, each having different domains serving different functions.

Applications include cell-based imaging agents, new drug development, and including antitoxins.

Available for nonexclusive biological materials licensing.

More info: Bruce Goldstein, J.D., M.S.; 301-435-5470

NCI Antibody Library

Invented by National Cancer Institute inventors Dimiter S. Dimitrov and Weizao Chen, and available for licensing and commercial development, is a highly diverse domain antibody (dAb) library providing antibodies that bind with high affinity to a variety of antigen targets. Antibody diversity is inherently limited by using only three CDRs of either light chain variable domain (LCDRs) or heavy chain variable domain (HCDRs).

This novel dAb library is designed using light chain variable domain 3 (LCDR3) and heavy chain variable domain (HCDR3), which are of primary importance for creating binding site diversity in the human immune system. The library contains 2.5 x 1010 dAbs. Human naturally occurring LCDR3s were grafted onto HCDR1 of m0.

More info: Michael A. Shmilovich, Esq.; 301-435-5019; shmilovm@mail.nih.gov

Superstructures

Los Alamos National Laboratory researchers have synthesized well-defined hybrid noble-metal/SiO2/semiconductor-nanocrystal superstructures with controllable metal core size, silica shell thickness, and nanocrystal composition/size. These structures can be designed to produce significant enhancements in emission efficiencies and/or absorption cross sections compared to isolated nanocrystals.

Applications include ultra thin solar cells, solid-state lighting, and amplification of surface plasmons.

More info: David Pesiri, 505-665-7279, pesiri@lanl.gov

Medical Microsensor

Assessing the condition of a patient in order to provide optimal care requires quick detection of vital signs, especially when treating shock. Space and Naval Warfare Systems Center Pacific (SPAWAR Pacific) has developed a handheld medical microsensor device for digitally monitoring and rapidly processing the medical condition of a patient vulnerable to shock or tissue damage in order to deliver optimal patient care. The technology consists of a single subdural microprobe with multiple sensors for simultaneously measuring/monitoring pH, blood gases and temperature; detecting the presence of severe infection in the body; as well as providing information on a patient's vital signs used to identify heart and kidney failure.

Another application of the sensor is monitoring tissue pH for assessment of tissue health where severe injury or frostbite has occurred.

More info: Darin Oelkers, 406-994-772, darin@montana.edu

Biocide

The Naval Research Laboratory (NRL) has developed a series of biocides that, when formulated with the proper resin systems, produce coatings and polymers that kill a variety of bacteria, molds and viruses on contact. The biocidal component is similar to those found in many products on the market.

The advantage of the NRL biocide stems from the novel design of the molecule, with one end being hydrophobic and the other hydrophilic. This structure causes the biocide to preferentially migrate to the surface, where it is most effective, while the resin or coating is still liquid. The structure also greatly reduces removal by leaching once dried or cured.

More info: techtran@utopia.nrl.navy.mil.

Storm water Runoff

The Naval Facilities Engineering Service Center has developed, tested and patented a storm water runoff treatment system that meets stringent military and government industrial site toxicity requirements.

The Navy system meets strict regulatory toxicity requirements in a cost-effective manner. The system is similar to a sand filter; however, instead of relying solely on sand, heavy metals (in particular, zinc and copper) are removed by a bed of special filter-absorption materials.

The Navy's storm water treatment system has consistently exceeded regulatory requirements, while the previous system met requirements only one-third of the time.

More info: Darin D. Oelkers, TeckLink, 406-994-7723, darin@montana.edu or Kurt Buehler, Naval Facilities Engineering Service Center, 805-982-4897

Cationic Polymers

Researchers at Los Alamos National Laboratory (LANL) have developed a new class of stable, water-soluble cationic polymers that possess quantum yields of 14% in water, among the highest ever reported.

Applications

- Polyelectrolyte self-assembly
- Chemical sensors
- Biological sensors
- LEDs

Advantages

- Facile synthesis
- Good yield
- Low cost

More info: David Pesiri, 505-665-7279, pesiri@lanl.gov

PNNL's Bottle Screening Tech

Pacific Northwest National Laboratory (PNNL) researchers have developed a new technology for detecting materials that can be used in transporting dangerous or illegal liquid and gels through checkpoints. PNNL's Container Screening Device (CSD) can be used across the full spectrum of screening stations by airport security screening specialists, customs and border patrols, law enforcement officers, and more. The technology uses sound waves to measure specific acoustic properties, allowing the operator to detect, classify, and discriminate benign liquids from substances such as liquid explosives, and hazardous and flammable liquids at security checkpoints.

In a three-month study, PNNL researchers successfully tested 181 liquid samples using a multi-property measurement method.

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Timlin, from page 1

Sandia chemist Jerilyn Timlin will use her National Institutes of Health (NIH) award to develop state-of-the-art imaging technology that can measure protein complex formation and protein networks.

dynamics and interactions at extreme resolutions." The work will aim to develop state-of-the-art imaging technology that can measure protein complex formation and protein networks in a multiplexed fashion with spatial resolution beyond that of the optical microsopy.

"I am so grateful to have this opportunity to equip the field of biological imaging with a new analytical tool for visualizing and quantifying multiple protein interactions," said Timlin. "I am honored to play a key role in growing Sandia's bioscience programs at the NIH." Timlin's award is for $1.5 million over five years.

A total of 115 awards have been granted by NIH under three innovative research programs supported by the NIH Common Fund's Roadmap for Medical Research: the NIH Director's Transformative R01 (T-R01) Awards, Pioneer Awards, and New Innovator Awards. The Common Fund supports cross-cutting, trans-NIH programs with a particular emphasis on innovation and risk taking.

A portion of the New Innovator Awards is also supported by funding from the American Recovery and Reinvestment Act.

"The appeal of the Pioneer, New Innovator, and now the T-R01 programs is that investigators are encouraged to challenge the status quo with innovative ideas, while being given the necessary resources to test them," said NIH Director Francis S. Collins. "The fact that we continue to receive such strong proposals for funding through the programs reflects the wealth of creative ideas in science today."

More information on the New Innovator Awards is at http://nihroadmap.nih.gov/newinnovator.

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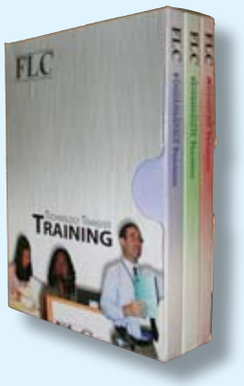

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