NEWSLINK

FEDERAL LABORATORY CONSORTIUM FOR TECHNOLOGY TRANSFER MARCH 2000 VOL. 16, NO. 3

NIH Biotech Breakthroughs Promise Healthier Future

Flash forward to 2015 for a futuristic look at new drugs created via biotechnology—breakthroughs in newly discovered causes, cures, preventions, and screening methods for disease. This new era in medicine promises endless possibilities:

- drugs that attack disease organisms and diseased cells more forcefully while sparing healthy cells
- genetically engineered therapies and individually tailored drugs
- highly developed light waves and ultrasound that activate medicines
- finely focused, high-powered X-rays
- more sophisticated and revealing blood tests.

Imagine powdered medicine for asthmatics that can be sprinkled over food, an implanted insulin pump for diabetics that is activated by a wrist magnet, or drugs implanted into a diseased site (*e.g.*, brain tumor) in a material that dissolves as the drug is released.

Life-Saving Drugs—and Birdseed!

Look for the **National Institutes of Health (NIH)** to be at the forefront of this biomedical frontier. One of the world's foremost biomedical research centers, the NIH is one of eight agencies in the **U.S. Public Health Service (PHS)**. Following its charter, this complex federal research facility plays a major role in the prevention, detection, diagnosis, and treatment of disease and disability—from the rarest genetic disorder to the common cold. In the last few decades, NIH research has helped to significantly reduce deaths from heart disease and stroke and has improved the survival rate for people with cancer—in addition to numerous other achievements that help people of all ages suffering from physical and mental diseases and disabilities.

Building a Biotech Future: The NIH campus—the Director's Office and the Clinical Research Hospital are shown here—houses 25 separate institutes and centers.

The world is a much healthier place thanks to the NIH's numerous inventions—a hepatitis A vaccine, the AIDS diagnostic test kit, the AIDS therapeutics ddI and ddC, fludarabine for children's leukemia, monoclonal antibodies, and various research tools (cDNA clones, cell lines, plasmid DNA, proteins/peptides, chemical compounds). There is also an improved method for administering paclitaxel (licensed as **Taxol** to **Bristol Myers Squibb**)—a widespread treatment for breast and ovarian cancer. Within a few years, the NIH will have also found more effective treatments for various cancers and helped to unravel DNA in the **Human Genome Project**.

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NASA Contributes to the Medical Industry

In aerospace design, every subsystem must be superefficient and ultra-reliable, yet as small and light as possible. Many medical devices share these same requirements, which is one reason **NASA** technologies have made major contributions to the medical field in areas such as diabetes, balance disorders, and osteoporosis. Here are just a few examples of how NASA technologies have been used in the fight against cancer and heart disease.

The Fight Against Cancer

- **Finding Breast Cancer.** Silicon chips from the Hubble Space Telescope were adapted so physicians can better detect tiny spots in breast tissue—allowing doctors to take biopsies using a needle rather than expensive and painful surgery. The new procedure eliminates scarring or disfigurement, requires half the time of traditional techniques, reduces exposure to X-rays, and dramatically cuts costs.

  For more info: www.nctn.hq.nasa.gov/ innovation/Innovation41/HubbleFights.html

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INSIDE

This issue of *NewsLink* focuses on **BIOTECHNOLOGY**. The April/May issue will focus on law enforcement and assistive technology.

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NIH *from p. 1*

Two unlikely but commercially favorable products recently developed by the NIH are an anti-aging cream and squirrel-repellent birdseed. The cream—a water-soluble form of retinoids—has been licensed for commercial use. And **Pepper-Treat™ Wild Bird Food**, which uses the pepper-like compound resiniferatoxin (found in a study of tumor promoters), is now on the market.

Royalties and a "Royal" Roster

The NIH's success can be quantified in a number of ways. Its "intramural" big winners—from research conducted at the Bethesda, MD campus and its 25 separate institutes and centers—have contributed almost $200 million in royalties within the last six years. According to a 1998 study, the NIH accounts for 70% of all federal royalties.

One success story involves a high-volume item called CHAPS—an NIH-patented zwitterionic detergent—that adds considerably to the PHS coffers with annual sales in excess of $100,000. CHAPS is used for protein purification in almost every lab in the world that does basic biological research.

Revenues from the extensive NIH-funded extramural research at universities and other centers are tallied separately. Approximately 50,000 principal investigators—from every major university and medical school and representing every medical specialty and biomedical discipline—receive NIH funding to explore new areas of biomedical science. The annual NIH budget exceeds $15 billion.

First-rate scientists are vital to NIH intramural research. The roster of those who have conducted research (or received NIH support over the years) is an illustrious one—a veritable "who's who" of scientists and physicians, including 97 Nobel Prize winners. In fact, five Nobelists made their prize-winning discoveries in NIH laboratories. Scientists of every scientific discipline or institutional affiliation are free to collaborate and pursue their research leads in NIH labs. NL

For more info: www.nih.gov

Dr. Freire and Her NIH Biotech Transfer Machine

Dr. Maria Freire

In just five short years, Dr. Maria Freire, Director of the **NIH's Office of Technology Transfer (OTT),** is credited with turning the NIH into the federal government's most prolific (and envied) "tech transfer machine"—and the world's largest, not-for-profit, biomedical, patent-seeking organization.

Respected nationwide for her aggressive, market-savvy, and cutting-edge tech transfer program, Freire's reputation extends internationally. In May, she will be one of the speakers at **Allicense 2000** in Basel, Switzerland—a conference that brings together executives from leading pharmaceutical companies, biotech companies, and medical institutions from around the world. Allicense synthesizes the best of biotech and pharma strategies to face the challenges of solving major medical needs—including the establishment of new and effective approaches for collaborative alliances.

World Biotech Player

Of the OTT's growth and achievements, Freire says simply, "Good technology transfer starts with good science." And, at NIH, the technology *is* good—thanks to some of the country's best scientists. However, Freire is quick to add that she's very proud of what her OTT office has been able to do with this "wonderful technology….If you do not transfer it effectively, it rots on the vine."

Dubbed "the licensing queen" by some members of the press, Freire is essentially responsible for

*Please see **FREIRE**, p. 3*

If You Would Like to Work with the NIH…

Information on available intellectual property at the NIH can be found through national meetings and publications. The *Federal Register* and technical journals also publish abstracts of these technologies. Here are some additional options.

- **CRISP.** Search the CRISP (Computer Retrieval of Information on Scientific Projects) database for a wealth of info on scientific concepts, emerging trends and techniques, and specific projects or investigators. A searchable database of federally funded biomedical research projects conducted at universities, hospitals, and other research institutions, CRISP can be found at <www-commons.cit.nih.gov/crisp>.
- **NIH Grants and SBIR Programs.** Research funded by NIH grants and SBIR/STTR programs is available for licensing from the appropriate contacts. Look for more info on these programs at <http://grants.nih.gov/grants/funding/sbir.htm>.
- **Licensing Technology.** NIH seeks licensees and/or CRADA partners to further develop and commercialize innovative, fundamental NIH/FDA intramural research discoveries. From FY93-98, NIH executed 967 licenses for invention. More info on the NIH licensing program can be found at <www.nih.gov/od/ott>.
- **CRADAs.** In an NIH CRADA (generally a multi-year agreement on significant medical R&D), a company contributes personnel and funding. CRADAs allow intramural scientists to gain early access to a company's promising new technology or attract a company to collaborate on the further development and commercialization of a new NIH technology. Important inventions—such a paclitaxel and a hepatitis A vaccine—were commercialized in part under CRADAs with industry. In FY98, NIH executed 167 new CRADAs, for a total of 435 active CRADAs. For a current NIH CRADA opportunity, see p. 6. NL

FREIRE from p. 2

separating the "commercially valuable wheat from the chaff" and overseeing the OTT's 60 employees and 1,500 active licenses—a number that increases by 200 or so a year. Final decisions on inventions are based both on the worth of the science and on future commercial prospects or public health benefits, says Freire. The results make the OTT "a major player in the invention pipeline for the world biotechnology industry."

New Guidelines Available

In her first year, Freire focused heavily on establishing policy guidelines for patenting and licensing. In December 1999, the OTT released its thoroughly critiqued, streamlined policy document, *Principles and Guidelines for Recipients of NIH Research Grants and Contracts on Obtaining and Disseminating Biomedical Research Resources* (available on the OTT web site). These paradigm-bending guidelines provide recipients of NIH funding with guidance on the terms for disseminating and acquiring unique research resources developed with federal funds. The NIH hopes these policy principles will serve as a standard for other R&D operations (especially in federal agencies) and will offer greater ease in transferring materials.

The NIH OTT is unique—not just to government but in tech transfer itself—because those in both policy and transaction work closely at the main NIH site. All patenting and licensing activity at the NIH is administered by the OTT, which has three main functional areas:

- **technology development and transfer**, which focuses on evaluating, protecting, marketing, licensing, and monitoring technologies
- **administrative functions**—including royalty billing, contract support, data system administration, and general administrative functions
- **policy, legislation, and interagency/ intergovernmental/international activities.**

The OTT has been designated the lead agency for technology transfer policy for the **Department of Health and Human Services (HHS)** and represents the HHS Secretary with various groups. OTT also issues NIH/PHS technology transfer policy through the PHS Technology Transfer Policy Board.

Due to its rapidly expanding license portfolio, the OTT has established a special initiative to implement a monitoring and enforcement function—and will be recruiting for two new positions to supplement existing staff assigned to this function.

Additionally, each of the 25 NIH institutes and centers has its own technology development staff—or uses one of the NIH technology service centers to assist in managing invention reporting, CRADA administration, material transfers, and clinical trials.

"Our policies reflect immediate experiences—day-to-day in the tech transfer trenches," says **Ted Roumel,** Assistant Director for Management and Operations. "We're not an ivory tower organization." NL

For more info: Elaine Ray, 301-594-7700, RayE@od.nih.gov; www.nih.gov/od/ott

NASA from p. 1

- **New Drug for Melanoma.** In January 1998, the **FDA** approved Proleukin for patients with metastatic melanoma cancer. The protein crystals researched for the new drug were grown on the Space Shuttle.
- **Smart Robot Probe for Cancer Detection**. NASA technology developed to perform surgery on astronauts in space is being adapted to help physicians operate on delicate parts of the human body, such as the brain and breast. The experimental robot uses a smaller, less invasive probe and makes more delicate and precise movements than a human.

Breast Cancer Probe

- **Using Light to Treat Tumors.** Special lights developed to grow plants in space are helping treat brain tumors in children. After injecting a light-sensitive, cancer-fighting drug into the bloodstream (which attaches to the affected tissue), doctors place a small device near the tissue. The device then emits light, activating the drug. The drug then penetrates and destroys only the affected tissue.

For more info: http://techtran.msfc.nasa.gov/new/tumorsrel.html

A Matter of the Heart

- **Beat of Your Heart.** NASA's bidirectional telemetry technology, first used to communicate with satellites, was the basis for a pacemaker that can be programmed from outside the body. The technology was also used in an implantable defibrillator, which senses irregular heartbeats and automatically delivers an electrical stimulus to get the heart back on track.

  For more info: www.sti.nasa.gov/tto/spinoff1996/25.html
- **Treating Heart Disease.** Laser angioplasty offers an alternative to surgery in the treatment of clogged arteries. A laser system first used for satellite-based studies of the atmosphere has been reapplied to treat atherosclerosis. NASA research led to the development of an excimer laser, which is now routinely used to clean arteries without damage to blood vessel walls.

This article was excerpted from the September/October 1999 issue of Aerospace Technology Innovations*—a bimonthly NASA publication. To read the full article, go to <http://nctn.hq.nasa. gov/innovation/index.html> for an online edition of the magazine.* NL

For more info: National Technolology Transfer Center, 800-678-6882; NASA Commercial Technology Network, www.nctn.hq.nasa.gov

TECHNOLOGY WATCH

Federal laboratory technologies available for technology transfer

How Cells "Catch" a Cold

Achoo! Scientists at the **DOE's Brookhaven National Lab** have taken what could be the first step toward finding a cure for the common cold. Using X-ray crystallography at Brookhaven's National Synchrotron Light Source, researchers have deciphered the molecular mechanism by which one type of cold virus binds to human cells. Because that binding is the first step in infection, finding a way to block it could bring relief to runny noses everywhere. The finding could also lead to targeted vaccines, a better understanding of how viruses evolve, and advances in gene therapy.

For more info: Karen McNulty, 631-344-8350, kmcnulty@bnl.gov

Industrial Enzymes and Food Grown in One Plant

Researchers at the **DOE's Pacific Northwest National Lab (PNNL)** can now control genes transplanted into a plant—allowing them to direct desirable traits into a specific portion of a plant, which results in crops that can produce both food and industrial enzymes. Experimental potatoes have sprouted the enzyme cellulase (used in applications ranging from food processing to ethanol production) in the vines, while the tubers remain "plain old spuds." The process can also be adapted to create lipases and proteases used in pharmaceuticals, specialty chemicals, and industrial products. Besides potentially boosting farmers' profits by $100 to $200 per acre, using the plants as a "bioreactor" is easier and cheaper. Currently, industrial enzymes are grown in fermenters—an expensive and time-consuming process. PNNL estimates that production costs for industrial enzymes could drop from $50 to $250 per gram to less than a penny per gram. PNNL researchers are using similar methods to produce human blood factors and tissue growth factors in plants.

For more info: 888-375-PNNL, inquiry@pnl.gov

Two-for-One Taters: These potato vines have been genetically altered by PNNL researchers to produce a commercially valuable enzyme—while the nonaltered tubers are good to eat.

NIST Physicists Develop New Tool to Validate Protein Modeling

Proteins are intriguing because of their potential applications in designing new pharmaceuticals, improving agriculture, and processing food, chemicals, and materials. They are also large and highly complex molecules that present difficult puzzles to biochemists trying to understand and define their structures. **NIST** physicists have developed a new tool—a Fourier transform microwave spectrometer—that could help verify protein modeling algorithms. One problem in deciphering protein structures is the large number of possible spatial orientations, which are so great current computer speeds are not fast enough to calculate all of them. Using the new tool, NIST physicists have determined several conformational isomers of small alkene molecules ranging in size from 5 to 12 carbon atoms. Because the bonds in these chains are similar to those in protein molecules, software designers could use the NIST data to verify the accuracy of their protein modeling algorithms.

For more info: Linda Joy, 301-975-4403, linda.joy@nist.gov

Experimental Neutron Diffraction Station Planned

According to a recent survey conducted by the **DOE's Los Alamos National Lab (LANL)**, U.S. scientists are eager to take advantage of the lab's planned structural biology neutron diffraction station. The survey results will help plan for the anticipated high user demand when the experimental station opens in mid-2001. Currently under construction, the station will be used to study protein crystals, membranes, biological fibers, and other biological structures. "This station will be the only resource of its kind in the nation serving the structural biology community for determining macromolecular structures," said program manager **Paul Langan**. Neutron diffraction's advantage over X-ray diffraction is that neutrons can pinpoint the positions of critical hydrogen atoms. Because the station will only be able to service one-fifth the anticipated user demand, the survey results are also being sent to the DOE's **Oak Ridge National Lab**, where the Spallation Neutron Source will be built.

For more info: Paul Langan, 505-665-8125, langan_paul@lanl.gov

New Ways to Tag and Track Molecules

Scientists at the **DOE's Brookhaven National Lab** are developing a wide array of metallic "tags" to label proteins and other molecules—expanding the toolbox that scientists use to decode molecular structures, diagnose and treat diseases, and trace the movement of antibodies and drugs within cells. The range of applications is limited only by scientists' ability to custom-design appropriate tags. For example, metal particles are used in home pregnancy test kits—producing the readable pink color when proteins

TECH WATCH *continued*

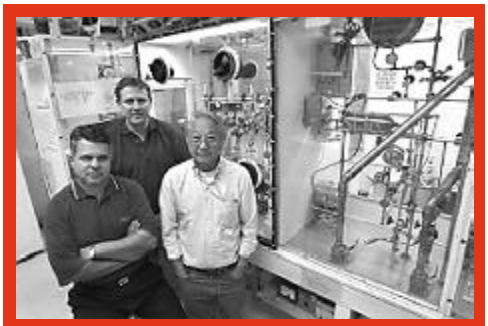
associated with pregnancy are present. In one study, a metallic tag helped identify key infection-initiating proteins on the surface of the hepatitis B virus. Tags can also be used to label the products of bioengineering and detect antibodies—potentially increasing the sensitivity of diagnostic techniques. The tags might even serve as "magic bullets" to deliver cell-killing radiation doses directly to cancer cells without causing harm to surrounding healthy tissue.

For more info: Dorry Tooker, 516-344-2078, dorryt@bnl.gov

Biotechnology at Berkeley Lab

The **DOE's Lawrence Berkeley National Lab (LBNL)** offers a variety of biotech-related resources and technologies. Here are just a few highlights.

- **New Biological Database.** After just six months, a new database that identifies clusters of proteins arising from alternative gene splicing received more than 35,000 requests from genetic and biological researchers. The **Alternative Splicing Data Base (ASDB)** is based at **LBNL's National Energy Research Scientific Computing Center (NERSC)** and contains some 1,700 protein sequences.
  For more info: http://cbcg.nersc.gov/asdb
- **Asthma-Linked Gene Discovery.** In late 1999, LBNL researchers announced the discovery of two genes—interleukin IL4 and IL13—that contribute to the development of asthma. The finding suggests that decreasing the activity of these two genes could help reduce susceptibility to asthma attacks. Their research results were reported in the October 1 issue of *Nature Genetics*.
  For more info: www.lbl.gov/Science-Articles/Archive/asthma-genes.html
- **New Nucleic Acid Labeling Technique.** Nucleic acids embrace more molecules than just giant strands of DNA and RNA, and several forms have shown promise for therapy—including antisense agents and aptamers. Recently, researchers at LBNL's **National Tritium Labeling Facility (NTLF)** found a new way to tag nucleotides for biochemical studies by labeling them with a trace amount of the radioactive element tritium. The new method should help synthesize many compounds related to the tritiated nucleotides.
  For more info: www.lbl.gov/Science-Articles/Archive/nucleic-acid-label.html



DNA Labelers: These Lawrence Berkeley Lab researchers have developed a new way to label nucleic acids that could lead to novel therapies.

New Chemical Manufacturing Method

The **DOE's Argonne National Lab's** involvement in a five-year, joint venture research program has led to advances that will enable scientists to produce ascorbic acid (commonly known as vitamin C) less expensively and with less harm to the environment. Based on a fermentation system, the technology is a major milestone in the development of new methods to manufacture chemicals from renewable raw materials like corn. The project's long-term goal is to reduce factory sizes by substituting enzymatic processes for chemical processing—thereby reducing manufacturing costs by lowering equipment costs. Partnering with **Genencor International Inc., Eastman Chemical Company, Electrosynthesis Inc.,** and **Microgenomics Inc.,** Argonne combined its technical expertise in energy systems, environmental research, mathematics, and computer science to develop the new system. Over the course of the project, **NIST's Advanced Technology Program** and the industrial partners have invested $31.3 million. In the project's remaining two years, the group hopes to develop second- and third-generation processes and extend the technology to other commercially valuable chemicals.

For more info: Cynthia Wesolowski, 800-627-2596, partners@anl.gov

New Microbial Compounds for Strep and Staph Infections

USDA Agricultural Research Service (ARS) scientists may have stumbled onto new antibiotics that control Streptococcus and Staphylococcus bacteria. The discovery involves a new family of antibiotic compounds—not related to penicillin—that exhibit potent antimicrobial activity. They made their find while looking for microbial compounds to control diseases like root rot of muskmelon and watermelon plants. Researchers have isolated six compounds that exhibit some degree of antibiotic activity against a broad spectrum of gram-negative and/or gram-positive bacteria of concern to both agricultural and health professionals. The compounds varied in their selectivity and ability to retard growth or kill important bacterial pathogens. The ARS researchers feel that some of their compounds may be as good as or better than commercial antibiotics at resisting bacterial infections.

For more info: Benny Bruton, 580-889-7395, bbruton-usda@lane-ag.org

Taxane Production from Taxus Species Cell Lines

A **USDA ARS** invention selects cell lines that can produce large quantities of taxanes (which can be used to treat breast, ovarian, and other types of cancers), which should result in more economical commercial production. Elicitors such as methyl jasmonate are known to stimulate taxane production in cells; the invention takes advantage of elicitor effects in cell suspension cultures to identify cells that produce taxanes easily in the culture cycle and in large quantities. Higher-producing cell lines identified by the invention can then be

*Please see **TECH WATCH**, p. 6*

TECH WATCH *continued from p. 5*

grown using conventional fermentation processes. The technology is of interest to the pharmaceutical, biotech, and fermentation industries.

For more info: Mary Ann Gwodz, 301-504-5345, mag@ars.usda.gov

Microbial Janitors Tackle Nuclear Cleanup

Researchers from the **DOE's Idaho National Engineering and Environmental Laboratory (INEEL)**—in partnership with **British Nuclear Fuels (BNFL)**—are launching a year-long test of a microbial decontamination technology at a UK nuclear reactor. The technology will remove surface contamination on a concrete wall. The microbes' job is to "eat and be merry." As the microbes metabolize an elemental sulfur nutrient source, they create sulfuric acid, which etches the concrete surface and loosens contaminated layers. When enough concrete has been loosened, researchers drop the humidity—killing the microbes. The degraded concrete is then vacuumed up and disposed of. Currently, contaminated concrete is treated by chipping it away until workers reach "clean" concrete—a process that exposes workers to radiation. When radiation fields are too high for human exposure, the only alternatives are to fill the room with cement or demolish the building and treat the rubble as radioactive waste. Biodecontamination significantly reduces cleanup costs and risk to workers.

For more info: http://inelext1.inel.gov/science/feature.nsf/ineel/concrete

NIH CRADA Opportunity

The **NIH's National Institute on Drug Abuse (NIDA)** is seeking proposals from potential collaborators for a Cooperative Research and Development Agreement (CRADA) to test the hypothesis that Corticotropin Releasing Factor (CRF) antagonists may help treat cocaine dependence. NIDA will consider proposals from all qualified entities and will provide substantial in-kind clinical and preclinical resources and access to NIDA's preclinical development components and clinical trials contractual network. (The CRADA collaborator will be free to use the CRADA data to pursue regulatory filings in the U.S. and abroad.) The collaborator will bear the financial and organizational costs of meeting its obligations under the negotiated research plan. At a minimum, NIDA intends to provide sufficient clinical trial services to permit R&D up to and including Phase II hypothesis testing trials. Assuming demonstration of safety and efficacy at the conclusion of Phase II trials, NIDA will consider undertaking Phase III trials so the collaborator can seek a U.S. New Drug Approval. NIDA will consider all proposals received within 90 days of the February 7 publication date in the *Federal Register*.

For copy of full notice: www.nih.gov/od/ott/CRF-NIDA.htm

For more info: Lee Cummings, 301-443-1143; Dr. Frank Vocci, 301-443-2711

New Standard for Mitochondrial DNA Sequencing

Since its development, DNA testing has been a key tool in diagnosing diseases, pinpointing criminal suspects, and identifying remains. While current DNA typing requires a sample found in the nucleus of nearly every living cell, a newer procedure makes use of a different kind of DNA—mitochondrial DNA, which is inherited only from your mother. Because a single cell can have thousands of these structures, mitochondrial DNA persists long after the DNA that makes up chromosomes has degraded. Certain diseases (such as Alzheimer's, Parkinson's, neuromuscular disorders, and some forms of blindness) are associated with mutations in mitochondrial DNA—making it a potential source of valuable data for medical researchers. To ensure the accuracy of mitochondrial DNA testing and sequencing, **NIST** has just issued Standard Reference Material (SRM) 2392, "Mitochondrial DNA Sequencing," which is designed to help labs verify their mitochondrial DNA results. The SRM is available for $766.

To order: 301-975-6776, srminfo@nist.gov

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SPOTLIGHT ON SUCCESS

Success stories from the federal lab community

Breast Cancer Screening Aid Cleared for Diagnostic Use

The war against breast cancer has a new weapon— thanks to an advanced sensor developed at **NASA's Jet Propulsion Laboratory (JPL).** The device, called the **BioScan System™,** was developed by **OmniCorder Technologies, Inc. (**Stony Brook, NY). OmniCorder received FDA clearance to market the system in December 1999.

Studies have determined that cancer cells exude nitric oxide, which causes blood flow changes in tissues surrounding the cancer. The changes can be detected by the sensor. The BioScan System™ is sensitive to temperature changes of less than 0.015 degree Celsius (0.027 degree Fahrenheit) and has a speed of more than 200 frames per second. It causes no discomfort to the patient and uses no ionizing radiation.

"Clearance for use of this noninvasive diagnostic tool is an important milestone for us," said OmniCorder president and CEO **Mark Fauci**, who noted that the device has also been cleared to be marketed for other applications.

Non-Invasive Diagnostic Tool: An advanced sensor developed by NASA is being used to screen for breast cancer.

The sensor, called the Quantum Well Infrared Photodetector (QWIP), was invented by **Dr. Sarath Gunapala**, principal engineer of JPL's Device Research and Applications Section. The digital sensor detects the infrared energy emitted from the body—thereby "seeing" the minute differences associated with blood flow changes. Earlier versions of QWIP had potential applications such as locating hot spots during fires and observing volcanoes.

"It is a great pleasure to see something I invented being used for public benefit," said Gunapala, "especially in medicine and even more so in the early detection of cancer."

The BioScan System™ also uses Dynamic Area Telethermometry™, invented by **Dr. Michael Anbar**, a founding scientist at OmniCorder. The two technologies work together to image the target area and provide physicians with immediate diagnostic information. NL

For more info: Karen Shaffer, 609-924-7966, Kshaffer@pcgads.com

For more success stories, visit the FLC web site at www.federallabs.org

Technology Transfer on the World Wide Web

National Center for Biotech Information
www.ncbi.nlm.nih.gov

Established in 1988 as a national resource for molecular biology information, the **NIH's National Center for Biotechnology Information (NCBI)** creates public databases, conducts research in computational biology, develops software tools for analyzing genome data, and disseminates biomedical information.

New Biomedical Engineering Web Site
http://grants.nih.gov/grants/becon/becon.htm

A new web site aimed at providing information and interactive opportunities on biomedical engineering debuted on January 31. The site contains info on the **Bioengineering Consortium (BECON)**, news and events concerning biomedical engineering, bioengineering symposia, NIH-supported funding opportunities in bioengineering, and general information about the field.

Biotechnology at Argonne National Lab
www.itd.anl.gov/conferences/bio99.html

Go here to take a "virtual tour" of the **DOE's Argonne National Lab** biotech-related divisions, facilities, publications, programs, projects, and technologies. Info on the many different ways to work with Argonne—as well as the lab-wide technical capabilities database—can be found here.

AFRL Information Directorate Tech Index
www.if.afrl.af.mil/tech/tech_index.html

Go here to view the **Air Force Research Lab Information Directorate** technology index, which includes information on topics such as artificial intelligence and operations research, databases for the 21st century, enabling technologies for simulation software, high performance knowledge bases, modeling and simulation, and much more.

Healthy Animals
www.ars.usda.gov/is/np/ha

Go here to access the quarterly online newsletter, *Healthy* Animals, which compiles **USDA Agricultural Research Service** news and expert resources on the health and well-being of agricultural animals and fish.

Have a suggestion for a tech transfer web site?
Send an e-mail with the URL to jbegley@utrsmail.com

COMING ATTRACTIONS

April 10-13, 2000

Discovery 2000: Emerging Strategies for Drug Discovery

San Diego, CA

This event will show you how to accelerate the process and harness the newest techniques and disciplines for drug discovery—bringing together scientists from areas such as genomics, biotechnology, bioinformatics, and combinatorial chemistry. The focus is on research data and innovative technologies and methodologies.

www.drugdiscovery2000.com

May 8-12, 2000

FLC National Meeting

Charleston, SC

Mark your calendars and plan to attend the FLC's 2000 National Meeting. With a theme of "Show Me the Way," the meeting will feature tech transfer training (beginner and advanced), sessions on how to use the FLC to advance your tech transfer efforts, and many networking opportunities. Don't miss the first FLC meeting of the 21st century!

Sherry Nacci, 856-667-7727 x120, snacci@utrsmail.com

May 20-23, 2000

Incubation Rocks! Rolling Out Innovative Programs for the 21st Century

Cleveland, OH

Hosted by the National Business Incubation Association, this event brings together business incubator managers, university administrators, economic development professionals, and others for 70+ sessions on topics ranging from successful kitchen incubation to incubating dot.coms to effective media relations.

www.nbia.org/conf/confs.html

July 20-22, 2000

Sitting on the Hot Seat: Technology Transfer for the New Millennium

Austin, TX

Attend the 25th annual meeting of the Technology Transfer Society and join your tech transfer peers—technology managers from government, industry, and academia; new business developers/manufacturers; policy makers; researchers; and venture capitalists—in a fast-paced learning and networking environment.

Frank Penaranda, 301-593-6472, frankpen@erols.com

August 14-17, 2000

International Symposium and Innovative Technology Tradeshow

Washington, DC

With a theme of "Moving Innovation into Practice for a Sustainable Future," this event—sponsored by the Civil Engineering Research Foundation—brings together 1,500 design, construction, and environmental leaders to develop and share guidelines on how organizations can successfully encourage, use, and facilitate technology innovations.

www.cerf.org/about/2000.HTM

November 12-16, 2000

Pacific Rim Biotech Conference and BioExpo 2000

Vancouver, BC

Hosted by BIOTECanada and the British Columbia Biotechnology Alliance, this event will address the challenges and opportunities facing the biotech community in the year 2000 and beyond. Highlights include leading-edge business solutions, hot science topics, partnering and tech transfer forums, and 70 exhibit booths.

www.biotech.bc.ca/pacrim2000

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