

Taxus®Express2™ Bypassing By-pass Surgery with Paclitaxel-Coated Stents

National Institute of Aging, National Institutes of Health

Taxus® Express2™ has the potential to benefit many of the victims of cardiovascular disease, which causes 40% of all deaths in the US. After a heart attack, patients often undergo an invasive by-pass surgery or a less invasive angioplasty procedure to open up the clogged artery. In the latter procedure, a tiny mesh-like device called a stent is inserted into the artery to keep it propped open. However, in many of the stent placement cases, the body reacts to this foreign object with scar tissue formation and the artery narrows again. Taxus® Express2™ is a medical device in which a cancer drug commonly known as Taxol® is imbedded into the interior of the stent. The drug is enclosed in a timed-release polymer so that it is dispensed into the tissue slowly and this prevents the re-blocking (restenosis) of the artery that is being treated. After the discovery was made in 1993, the first license agreement was signed between NIH and Angiotech in 1996 and resulted in the refinement of the original prototype. After showing the efficacy of the stent's design in animals, Angiotech collaborated with Boston Scientific to test the product in humans and, after extensive clinical testing, the product finally won FDA approval in 2004. In a short time this revolutionary device has established itself as the preferred method of treating patients slated for stent placement. This device has dramatically reduced restenosis rates in patients treated with stents to just 3 to 6 percent, meaning far fewer return visits to the catheterization lab or operating room for cardiac patients. Indeed, these drug-coated stents have established themselves so well in surgical circles that they are expected to substantially reduce the number of open-heart by-pass surgeries, which are currently estimated to be over 350,000 cases in the US.

Primary Contact: Dr. Steven J. Sollott, Head, Cardioprotection Unit, Laboratory of Cardiovascular Science, National Institute of Aging, National Institutes of Health, 3-137, 5600 Nathan Shock Drive, Baltimore, MD 21224, Phone: 410-558-8202 and -8657, Fax: 410-558-8150, E-mail: sollotts@grc.nia.nih.gov

Second Inventor: Dr. James Kinsella, NIH Senior Investigator Emeritus, Public Health Emergency Preparedness Coordinator, Madison County (NY) Department of Health

	FLC Representative Making Nomination	Nominee(s)' Supervisor	ORTA Representative Technology Transfer Program Manager	Lab Director
Name:	Krishna Balakrishnan	Dan L. Longo	Donald Bortner	Richard Hodes
Address:	6011 Executive Blvd., #325	5600 Nathan Shock Drive RM 1E07	Mail Stop Code 1E15, 5600 Nathan Shock Dr	9000 Rockville Pike Mailstop Code: 2292
City:	Rockville	Baltimore	Baltimore	Bethesda
State/Zip:	MD 20852	MD 21224	MD 21224	MD 20892
Phone:	301-435-3888	410-558-8110	410-558-8100	301-496-9265
Fax:	301-402-0220		410-558-8103	
E-mail	balki@nih.gov	longod@grc.nia.nih.gov	bortnerd@grc.nia.nih.gov	hodesr@mail.nih.gov

New Star-of-Bethlehem Plants

Floral and Nursery Plants Research Unit

The Floral and Nursery Plants Research Unit of the USDA's National Arboretum developed the first potted-plant types of Star-of Bethlehem (*Ornithogalum*). Dr. Robert Griesbach led the Government/Industry/University team. A Trust Agreement was established between the Industry, Government and University. In this Agreement, Industry supplied funds for the University to collect germ plasm which was then used in breeding by the U.S. Government. A series of cultivars with different

flower colors were created and were each granted a U.S. Plant Patent and Australian Plant Breeders Rights ('Chesapeake Blaze', 'Chesapeake Starlight', 'Chesapeake Sunset', 'Chesapeake Snowflake', and 'Chesapeake Sunburst'). In order to propagate these plants on the large scale required for commercialization, new tissue cultures methods were developed and transferred to commercial laboratories in the United States, Europe and Australia. These hybrids were first sold at the retail level in 2005 within the United States, Europe and Australia and are expected to become a major floral potted plant. It is estimated that the total market value to the floral industry world-wide could be \$30 million per year.

Primary Contact: Dr. Robert J. Griesbach, Research Geneticist, Floral and Nursery Plants Research Unit, U.S. National Arboretum, USDA, ARS, BARC, 10300 Baltimore Avenue, Bldg. 010A, Beltsville, MD 20705-2350, Phone: 301-504-6574, Fax: 301-504-5096, E-mail: rob.griesbach@usda.gov

	FLC Representative Making Nomination	Nominee(s)' Supervisor	ORTA Representative Technology Transfer Program Manager	Lab Director
Name:	Harry D. Danforth	John Hammond	Richard Brenner	Phyllis Johnson
Address:	USDA-ARS-BA Bldg. 003, Rm. 208 10300 Baltimore Ave.	USDA-ARS-BA Bldg. 010A 10300 Baltimore Ave.	ARS-OTT GWCC 4-1156 5601 Sunnyside	USDA-ARS-BA Bldg. 003, Rm 223 10300 Baltimore Ave.
City:	Beltsville	Beltsville	Beltsville	Beltsville
State/Zip:	MD 20705-2350	MD 20705-2350	MD 20705-5131	Maryland 20705-2350
Phone:	301-504-6421	301-504-0630	301-504-6905	301-504-6078
Fax:	301-504-6001	301-504-0632	301-504-5060	301-504-6001
E-mail	Danforthh@ba.ars.usda.gov	hammondj@ba.ars.usda.gov	Richard.brenner@nps.ars.usda.gov	johnsonp@ba.ars.usda.gov

Enhancing Growth, Yield and Fruit Quality of Date Palm Trees in Coachella Valley, CA

Sustainable Agricultural Systems Laboratory, BA, ARS, USDA

Total acreage for date production in the U.S. consists of 7,000 acres in the Coachella Valley, California and 600 acres in BARD area near Yuma, Arizona. Tree vigor in many of these full-bearing orchards precipitously declined in the last three decades in spite of timely applications of water and commercial fertilizers. The frequency of fallen trees increased and yield and fruit quality showed significant decline. The California Date Commission and the Coachella Valley Natural Resources Conservation District Board of Directors requested help from USDA's Agricultural Research Service. To analyze and solve the problem, USDA designated Dr. Aref A. Abdul-Baki, a plant physiologist with many years of experience on date orchard management. Dr. Aref A. Abdul-Baki acquired this knowledge on dates while working in North Africa and Saudi Arabia. Dr. Abdul-Baki and his collaborator, Mr. Sam Aslan, a soil conservationist, Natural Resources Conservation Service at Indio, California, delved deep into the problem for seven years. Their research revealed that the primary cause for the tree vigor decline as well as reduction in the fruit yield and quality was a combination of (1) soil stratification by eroded material from neighboring hills being deposited in the Valley at the time it was formed and (2) soil compaction caused by excessive use of farm machinery. This combination negatively affected root growth and water/nutrient use efficiency. The two scientists together solved the problem by introducing a 2-step treatment. First, slip plowing the field to fracture the strata and mix the soil 5 feet wide and 6 feet deep, and second, seed the orchards with Lana vetch – a legume cover crop that fixes nitrogen and prevents the soil from re-compacting by allowing a robust root growth and a deep network of roots. This approach provided a practical and economical solution, and is now widely applied over 45% of the date and vineyard acreage in the Coachella Valley. This exotic crop generates \$38 million annually in revenue and use of this technology has reduced production costs by \$100 per acre due to savings on cultivation, fertilization and most importantly decreased water usage.

Primary Contact: Dr. Aref A. Abdul-Baki, Research Plant Physiologist, Sustainable Agricultural Systems Laboratory, BARC, ARS, USDA, 10300 Baltimore Avenue, Bldg. 001, Room 245, Beltsville, MD 20705-2350, Phone: 301-504-7199, Fax: 301-504-6419, E-mail:abdul-ba@ba.ars.usda.gov

Cooperator: Mr. Sam Aslan, District Soil Conservationist, Natural Resources Conservation District, 82901 Bliss St., Indio, CA 92201.

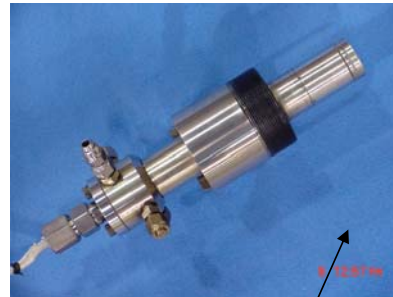
	FLC Representative Making Nomination	Nominee(s)' Supervisor	ORTA Representative Technology Transfer Program Manager	Lab Director
Name:	Harry D. Danforth	John Teasdale	Richard Brenner	Phyllis Johnson
Address:	USDA-ARS-BA Bldg. 003, Rm. 208 10300 Baltimore Ave.	USDA-ARS-BA Bldg. 001, Rm 245 10300 Baltimore Ave.	ARS-OTT GWCC 4-1156 5601 Sunnyside	USDA-ARS-BA Bldg. 003, Rm 223 10300 Baltimore Ave.
City:	Beltsville	Beltsville	Beltsville	Beltsville
State/Zip:	MD 20705-2350	MD 20705-2350	MD 20705-5131	Maryland 20705-2350
Phone:	301-504-6421	301-504-7199	301-504-6905	301-504-6078
Fax:	301-504-6001	301-504-6419	301-504-5060	301-504-6001
E-mail	Danforthh@ba.ars.usda.gov	teasdale@ba.ars.usda.gov	Richard.brenner@nps.ars.usda.gov	johnsonp@ba.ars.usda.gov

Combustion Control and Diagnostics Sensor (CCADS) for Gas Turbines

U. S. Department of Energy's National Energy Technology Laboratory
(NETL)

The combustion control and diagnostics sensor (CCADS) analyzes the electrical properties of the flame to monitor combustion behavior in gas turbine combustors. When important combustion parameters such as air-to-fuel ratio vary, the changes in flame ionization result in a corresponding change of the electrical properties measured using CCADS. The harsh high pressure and temperature environment of gas turbine combustors presents significant challenges for sensor durability. The CCADS is integrated into the combustor fuel nozzle to achieve low cost, ease of installation, and durability.

All combustion processes require a fuel and an oxidizer, usually air. Balance between the fuel and oxidant is critical to ensure that the process is clean and efficient. To maximize efficiency and minimize emissions, many advanced gas turbine systems – the kind that will increasingly be used to generate electricity – employ “lean-premix combustion” techniques. In a lean premixed gas turbine combustor, introducing too little fuel generates excess carbon monoxide, a dangerous pollutant, and too much fuel generates excess nitrogen oxides, which produce smog. Precise metering and mixing of the fuel with the air before combustion minimize production of carbon monoxide and nitrogen oxides. While providing superior pollutant emissions performance, however, lean premixed combustion can suffer from operational problems including pressure oscillations, flashback, and lean blowout. Perturbations from ideal conditions, such as unexpected changes in fuel composition, changes in air pressure and temperature (weather), or engine wear can trigger combustor problems which lead to minor damage and downtime for repair, or even to catastrophic failure that requires replacement of the turbine. As a result, balancing the mixture of air-to-fuel must be performed continually to maintain optimum performance. This continual balancing requires sensors in the combustor to provide key feedback on combustor performance – key feedback which CCADS provides.



CCADS Prototype

Comment [NETL1]: This is not 100% correct, since excess air will lower NOx in most cases. I think we could delete the sentence, but perhaps we need to explain why NOx emissions are bad?

CCADS was developed by researchers in the Office of Science, Technology and Analysis at the Department of Energy's National Energy Technology Laboratory. The research was sponsored by DOE's Advanced Gas Turbine and Advanced Research Programs. NETL researchers have been issued two patents, with other patents pending, on the CCADS technology. A Cooperative Research and Development Agreement was established with Woodward Industrial Controls to design and test a commercial prototype CCADS. The CRADA efforts culminated in 2004 with two successful demonstrations of CCADS in two very different advanced gas turbine designs. Woodward and NETL are working under a second CRADA to address some R&D issues for commercializing CCADS, and Woodward is negotiating with Turbine OEM's for commercial sales. The expectation is that CCADS will provide the key in-situ monitoring for diagnostics and control of modern gas turbines, allowing them to achieve stable ultra-low emissions performance

Primary Contact: Mr. Jimmy D. Thornton, Co-Project Leader, Co-Inventor, Research Group Leader, Sensors and Controls Development, Energy System Dynamics Division, Office of Science and Technology Analysis (OSTA), National Energy Technology Laboratory, P.O. Box 880 3610 Collins Ferry Road, Morgantown, WV 26508-0880, Phone: 304-285-4427, Fax: 304-285-4403, E-mail: Jimmy.Thornton@netl.doe.gov

NETL Team Members

- Mr. Jimmy Thornton, Co-Project Leader, Research Group Leader, Sensors and Controls Development
- Dr. Benjamin Chorpeneing, Co-Project Leader, senior R&D Staff Member
- Mr. Douglas Straub, Co-Project Leader, Research Group Leader, Combustion Dynamics
- Mr. E. David Huckaby, Co-Project Leader, Senior R&D Staff Member
- Dr. George Richards, Focus Area Leader, Energy Systems Dynamics Focus Area

Woodward Industrial Controls Team Member: Mr. Kelly Benson, Woodward Project Leader, Senior Staff Engineer, Woodward Fluid Systems and Controls CoE

	FLC Representative Making Nomination	Nominee(s)' Supervisor	ORTA Representative Technology Transfer Program Manager	Lab Director
Name:	Diane Newlon	Dan Maloney	Diane Newlon	Carl O. Bauer (Acting)
Address:	P.O. Box 880 3610 Collins Ferry Road	P.O. Box 880 3610 Collins Ferry Road	P.O. Box 880 3610 Collins Ferry Road	P.O. Box 880 3610 Collins Ferry Road
City:	Morgantown	Morgantown	Morgantown	Morgantown
State/Zip:	WV 26508-0880	WV 26508-0880	WV 26508-0880	WV 26508-0880
Phone:	304-285-4086	304-285-4629	304-285-4086	304-285-4511
Fax:	304-285-1301	304-285-4403	304-285-1301	304-285-4292
E-mail	newlon@netl.doe.gov	Daniel.Maloney@netl.doe.gov	newlon@netl.doe.gov	Carl.Bauer@netl.doe.gov

Parvovirus B19 Diagnostic Test Kit

Hematology Branch of the National Heart, Lung and Blood Institute, NIH

Dr. Neal Young, of the National Heart, Lung and Blood Institute, NIH discovered parvovirus B19 capsids that were instrumental in the development of the first and only FDA approved parvovirus B19 Diagnostic Test Kit. Parvovirus B19 (B19V) is the causative agent of the relatively benign childhood disease, erythema infections (fifth's Disease). The B19 infection is pregnancy is often overlooked simply because most infected pregnant women are asymptomatic (show no symptoms) or they have a mild manifestation of B19, such as slight itching. Pregnant women (in the first and second trimesters) with the B19V infection can give rise to serious fetal complications during pregnancy. Up to 50% of women have not been exposed to the virus and thus are susceptible to parvovirus B19 infection. The B19 infection may result in anemia, pregnancy miscarriage and/or hydrops fetalis. Early diagnosis of B19V infection will identify those at risk and may allow for early intervention therapy, thereby improving fetal survival. Patients who are immunocompromised (e.g., receiving chemotherapy or immunosuppressive drugs or have immune deficits) may develop chronic B19V infection that causes chronic anemia. Dr. Young has also recently discovered that a transient aplastic crisis of sickle cell disease and chronic arthropathy/arthritis, especially in middle-aged women with fifth disease, was due to the B19 virus. However, many people with parvovirus infections show no symptoms at all. People may simply be tired or have flu-like symptoms. Therefore the only way to know if a person has parvovirus B19 infection is to have a test for it using this NIH developed diagnostic test kit. Appropriate patient management is dependent on accurate B19V diagnosis, thus screening patients for B19V antibody status will determine the need for further medical follow-up and/or intervention.

Primary Contact: Dr. Neal Young, MD, Chief of the Hematology Branch, National, Heart, Lung and Blood Institute, 10 Center Drive, CRC 3-5142, MSC 1202, Bethesda, MD 20892-1202, Phone: 301-496-5093, Fax: 301 496-8396, E-mail: youngn@nhlbi.nih.gov

2nd Nominee: Dr. Sachiko Kajigaya, Ph.D.

	FLC Representative Making Nomination	Nominee(s)' Supervisor	ORTA Representative Technology Transfer Program Manager	Lab Director
Name:	Lili Portilla	Robert Balaban, Ph.D.	Lili Portilla	Robert Balaban, Ph.D
Address:	6705 Rockledge Drive, #6018 MSC 7992	10 Center Drive, CRC 4- 1581, MSC 1458		10 Center Drive, CRC 4- 1581, MSC 1458
City:	Bethesda	Bethesda		Bethesda
State/Zip:	MD, 20892-7992	MD, 20892-1458		MD 20892-1458
Phone:	301-594-4273	301-496-2116		301-496-2116
Fax:	301-594-3080	301-594-8099		301-594-8099
E-mail	Lilip@nih.gov	balabanr@nhlbi.nih.gov		balabanr@nhlbi.nih.gov

Accelerated Magnetic Resonance Imaging- (T-SENSE)

Laboratory of Cardiac Energetics of the National Heart, Lung and Blood Institute, NIH

Drs. Peter Kellman and Elliot McVeigh of the National Heart, Lung, and Blood Institute have developed an accelerated magnetic resonance imaging (MRI) method to reduce the total imaging time for lengthy scans. Their method may be for imaging dynamic events such as heart motion or brain activity. The technology exploits the spatial and temporal correlation of MR signals by combining parallel imaging and temporal filtering to achieve a new MRI technique referred to as (TSENSE). The TSENSE method has a higher degree of artifact suppression using parallel imaging and temporal filtering (an MRI artifact is an image attribute, which is not present in the original imaged object). The new technique tracks changing coil sensitivities over time, which may arise due to chest wall or other body motions, and provides time saving by eliminating a separate reference acquisition. This discovery has led to a robust accelerated imaging method that tolerates body motion or change in scan plane without the need to reacquire additional reference images. Prior to this discovery, it was difficult to obtain clear images with motion during patient scans, and has enabled the use of parallel imaging acceleration for real-time applications where the scan plane orientation is frequently changed. This improvement has general applicability to imaging various activities in human, (e.g. blood flow, brain activity and heart motion) in a shorter period of time, thus reducing scan time for patients and reduced artifacts that can lead to misdiagnosis of MR scans.

Primary Contact: Peter Kellman, Ph.D., Staff Scientist, Laboratory of Cardiac Energetics, National Heart, Lung, and Blood Institute

2nd Nominee: Elliot McVeigh, Ph.D., National, Heart, Lung and Blood Institute, 10 Center Drive, Room B1D416, MSC 1061, Bethesda, MD 20892-1061, Phone: 301-496-3658, Fax: 301 402-2389, E-mail: kellmanp@nhlbi.nih.gov or Mcveighe@nhlbi.nih.gov

	FLC Representative Making Nomination	Nominee(s)' Supervisor	ORTA Representative Technology Transfer Program Manager	Lab Director
Name:	Lili Portilla	Robert Balaban, Ph.D.	Lili Portilla	Robert Balaban, Ph.D
Address:	6705 Rockledge Drive, #6018 MSC 7992	10 Center Drive, CRC 4- 1581, MSC 1458		10 Center Drive, CRC 4- 1581, MSC 1458
City:	Bethesda	Bethesda		Bethesda
State/Zip:	MD, 20892-7992	MD, 20892-1458		MD 20892-1458
Phone:	301-594-4273	301-496-2116		301-496-2116
Fax:	301-594-3080	301-594-8099		301-594-8099
E-mail	Lilip@nih.nih.gov	balabanr@nhlbi.nih.gov		balabanr@nhlbi.nih.gov

Preventing and Reducing the Effects of Noise-induced Hearing Loss

Naval Medical Center San Diego

Dr. Richard Kopke and Dr. Michael Hoffer of Naval Medical Center San Diego, along with Dr. Donald Henderson of State University of New York at Buffalo, have developed a product that will help make sure the answer to the popular question, "Can you hear me now?" is a resounding "Yes!" Their research and subsequent technology transfer efforts have led to The Hearing Pill™, an antioxidant nutraceutical that prevents, reduces, and even reverses the effects of noise-induced hearing loss, the second most reported occupational illness or injury in America. Military personnel and the more than 30 million Americans of all ages who are exposed to hazardous levels of noise on a regular basis can benefit from this technology transfer success. In fact, US troops in Iraq are already benefiting from several cases of product sent by the licensee, American BioHealth Group (ABG).

The Hearing Pill™ has moved rapidly to human clinical trials, which were designed to provide direct benefit to American troops and move the product through the FDA approval process. The Hearing Pill™ has already sold thousands of bottles online as an over-the-counter remedy. ABG is gearing up its sales efforts to distribute the product through retail sales outlets and prepare for the day when it can market an FDA-approved medicine.

Primary Contact: Ben Balough, CDR, MC, USN

Second Nominee: Richard Kopke, COL(RET), MC, USN

Second Nominee: Dr. Michael E. Hoffer, CDR, MC, USN

	FLC Representative Making Nomination	Nominee(s)' Supervisor	ORTA Representative Technology Transfer Program Manager	Lab Director
Name:	Dr. Charles Schlagel	CDR Ben Balough	Lynda Reed	RADM B.G. Brannman
Address:	Naval Medical Research Center	Naval Medical Center San Diego 34800 Bob Wilson Drive	Naval Medical Center San Diego 34800 Bob Wilson Drive	Naval Medical Center San Diego 34800 Bob Wilson Drive
City:	Silver Spring	San Diego	San Diego	San Diego
State/Zip:	MD, 20910-7500	CA 92134-2200	CA 92134-2200	CA 92134-2200
Phone:	310-319-7428	619-532-9604	619-532-8136	619-532-6900
Fax:	301-319-7432	619-532-8137	619-532-8137	619-532-8137
E-mail	schlagelc@nmrc.navy.mil	bjbalough@nmcsd.med.navy.mil	lreed@nmcsd.med.navy.mil	bqbrannman@nmcsd.med.navy.mil

Humane Device for Bleeding Mice

USDA – North Atlantic Area – Agricultural Research Service (ARS) – Plum Island Animal Disease Center – Foot-And-Mouth Disease Research Unit – Greenport, NY

Working in a research area that uses mice as experimental animals, Bill Golde and Luis Rodriguez became frustrated with the present cumbersome and inhuman methods of bleeding laboratory mice. The primary method used in the U.S. is retro-orbital (eye) bleeding. This is a rapid and efficient bleeding method but extremely inhumane for the mouse. In fact, the UK has banned this procedure. Alternatively, bleeding by clipping off the end of the tail is simple and slightly more humane, but yields a very limited amount of blood and neither method can be used when multiple samples are required from the same animal. Mice can be bled from the submandibular region (at the rear of the “cheek pouch”) using a scalpel to puncture one of the veins that drain the eye, the rear portion of the submandibular vein or the junction of the two. A great deal of practice and a fine touch is required as the scalpel must be inserted deep enough to puncture the vein but not so deep that it goes through the cheek. It is very difficult to learn this technique to consistently go deep enough to draw blood and not puncture the cheek. Bill and Luis recognized that if they could design a device that could only be inserted to a specific depth they may have a simple method for bleeding mice that could be easily taught and mastered. They were unsuccessful in their attempt to modify finger stick lancets diabetics use so they designed a prototype lancet they believed would work. Peter Gollobin, the owner of a small Long Island company that designs and manufactures medical products was invited to the laboratory to discuss design and manufacture of a prototype, and a CRADA was established. Peter designed and produced several lancets that were tested. Additional modifications and improvements established a design that was easy to use and worked every time. The final design is a 2” strip of surgical steel handle with a triangular blade that is narrower than the handle which provides a shoulder that prevents the blade from penetrating deeper than the length of the blade. The lancet comes with different point lengths for different size mice.

Primary Contact: William Golde, Microbiologist, Plum Island Animal Disease Center, P.O. Box, Greenport, Long Island, NY 11944-0848, Phone: 631-323-3249, Fax: 631-323-3006, E-mail: wgolde@piadc.ars.usda.gov

Secondary: Luis Rodriguez, Microbiologist, Plum Island Animal Disease Center

Secondary: Peter Gollobin, President, MEDIpoinT, 72 East Second Street, Mineola, NY 11501-2336, Phone: 516-294-8822, Fax: 516-746-6693, E-mail: medipoint1@aol.com

	FLC Representative		ORTA Representative	
	Making Nomination	Nominee(s)' Supervisor	Technology Transfer Program Manager	Lab Director
Name:	C.G. Crawford	Wilda H. Martinez	Rick Brenner	Wilda H. Martinez
Address:	USDA-ARS-NAA 600 E. Mermaid Lane	USDA-ARS-NAA 600 E. Mermaid Lane	USDA-ARS 5601 Sunnyside Avenue	USDA-ARS-NAA 600 E. Mermaid Lane
City:	Wyndmoor	Wyndmoor	Beltsville	Wyndmoor
State/Zip:	PA 19038	PA 19038	MD 20705	PA 19038
Phone:	215-233-6610	215-233-6593	301-504-6735	215-233-6593
Fax:	215-233-6777	215-233-6719	301-504-5060	215-233-6719
E-mail	cgcrawford@naa.ars.usda.gov	wilda.martinez@ars.usda.gov	richard.brenner@nps.ars.usda.gov	wilda.martinez@ars.usda.gov

Micro Pulse Lidar (MPL) and the MPL Network (MPLNET)

NASA Goddard Space Flight Center

In the late 1960s, lidar (or laser radar) revolutionized observations of clouds and haze in the atmosphere; however, lidar was extremely difficult to employ. The Micro Pulse Lidar (MPL) technology was developed to fill NASA's need for a practical ground-based tool for calibrating and validating satellite-based measurements of clouds and aerosols as well as to conduct base research. Prior to MPL's development in the early 1990s, lidar systems were not eye-safe; were not reliable; and were large, complex, and costly. The MPL device offered vast improvements, providing the only means for continuous, routine lidar monitoring, particularly in remote areas. MPL offered simple, remote, and autonomous operation; long-term (>2-year) reliability; and accurate and comprehensive data gathering in an eye-safe, small, inexpensive, low-power package. Because MPL operates autonomously, personnel costs for lidar system operations decreased dramatically. MPL was first made commercially available in 1994. Sales worldwide created the possibility for a global network of systems, and in 2000 MPLNET was formed. Coordinated by NASA, MPLNET combines the MPL data gathered by the network's members and makes the data available free to scientists and researchers around the world.

For MPLNET to continue to grow, an additional commercial source for MPL devices was needed. Another license was established in October 2004, and that company (Sigma Space Corp.) refers its customers to the MPLNET, encouraging them to become members. The data being processed by MPLNET are available to researchers around the world at no cost. More than 170 researchers have registered to use the data, many of whom have published in more than two dozen articles in *Science*, the *Journal of Geophysical Research*, and the *Journal of Atmospheric and Oceanic Technology*, and other periodicals and presented at more than 50 conferences. Registration is not required to use MPLNET data, however, and the site has had more than 15,000 hits since being launched in 2000. MPL has been and continues to be one of the key cloud-monitoring instruments for the Atmospheric Radiation Measurement (ARM) Program, the largest global change research program supported by the U.S. Department of Energy (DOE). MPL also has been used in many other experiments and research projects.

The MPL device and the data made available through the MPLNET have opened the door to a previously inaccessible realm of research, allowing Earth's atmosphere to be safely studied with lidar. MPL has enabled atmospheric aerosol and cloud data to be obtained safely, continuously, and less expensively than was previously possible. And as MPLNET has demonstrated, MPL also has the potential to be used as part of a vast network of monitoring devices for environmental protection or homeland security applications.

Primary Contact: Dr. James D. Spinhirne, Senior Scientist, NASA Goddard Space Flight Center (GSFC), Mailstop 613, Greenbelt, MD, 20771, Phone (301) 614-6274, Fax: (301) 614-5492, E-mail: James.D.Spinhirne@nasa.gov

Project Leaders:

MPL: Dr. James D. Spinhirne, Senior Scientist, NASA GSFC, Mailstop 613.1

MPLNET: Dr. Ellsworth J. Welton, Physical Scientist, NASA GSFC, Mailstop 613.1

Other Nominees

Mr. V. Stanley Scott, III, Research Scientist, NASA GSFC, Mailstop 694.0

Mr. James R. Campbell, Research Meteorologist, Science Systems and Applications, Inc. (SSAI), 10210 Greenbelt Road, Suite 600, Lanham, MD 20706

Mr. Timothy A. Berkoff, Research Engineer, University of Maryland, Baltimore County, located at NASA GSFC, Mailstop 613.1

Mr. Luis A. Ramos-Izquierdo, Research Scientist, NASA GSFC, Mailstop 694.0

Mr. Dennis L. Hlavka, Research Scientist, SSAI, located at NASA GSFC, Mailstop 613.1

Ms. Sandra C. Valencia, Research Scientist, SSAI, located at NASA GSFC, Mailstop 613.1
 Mr. Daniel Hopf, Research Scientist, ITT Industries, Advanced Engineering and Science, 2655
 Commons Blvd., Suite 110, Beavercreek, OH 45431-3773
 Mr. Brent N. Holben, Research Scientist, NASA GSFC, Mailstop 614.4
 Dr. Si-Chee Tsay, Research Scientist, NASA GSFC, Mailstop 613.2

	FLC Representative Making Nomination	Nominee(s)' Supervisor	ORTA Representative Technology Transfer Program Manager	Lab Director
Name:	Dale.L.Hithon	Dr. David Starr	Nona Cheeks	Edward J. Weiler
Address:	NASA GSFC Mailstop 504.0	NASA GSFC Mailstop 613.1	NASA GSFC Mailstop 504.0	NASA GSFC Mailstop 100.0
City:	Greenbelt	Greenbelt	Greenbelt	Greenbelt
State/Zip:	MD 20771	MD 20771	MD 20771	MD 20771
Phone:	(301) 286-2691	(301) 614-6191	(301) 286-5810	(301) 286-5182
Fax:	(301) 286-0301	(301) 614-5492	(301) 286-0301	
E-mail	Dale.L.Hithon@nasa.gov	David.Starr@nasa.gov	Nona.K.Cheeks@nasa.gov	Edward.J.Weiler@nasa.gov

Special Medical Emergency Evacuation Device

U.S. Army Institute Of Surgical Research (USAISR)

A device invented by Army staff sergeant Eric Smeed during a mass casualty exercise is now patented, licensed and in production for military medicine. SGT Smeed volunteered to help the U.S. Army Institute of Surgical Research's burn team during a mass casualty exercise in March 2000. Approached by LTC Lee Cancio, the Special Medical Augmentation Response Team leader in San Antonio, Smeed was asked to find a way the team could avoid strapping medical equipment to a patient, which is uncomfortable to the victim and can injure the patients and the equipment. A few days later SGT Smeed developed a cardboard version of the critical care platform (stretcher) and presented his idea to LTC Cancio. After developing a \$1500 prototype with the Air Force machine shop at Brooks Air Force Base in Texas he then created three additional versions. The SMEED (Special Medical Emergency Evacuation Device) is an aluminum and stainless steel platform that adjusts to three heights. It mounts anywhere on a standard NATO litter and with two pins and special brackets can hold portable medical equipment, including a ventilator, suction, monitor, infusion pump, power supply and steel and carbon-fiber oxygen cylinders. The sergeant's platform speeds up patient transfer as the injured soldier moves from the battlefield to the battalion aid station and on to higher echelons of care. The platform was initially designed solely for the ISR burn flight team's use, but when the team displayed it at a Special Operations Conference, it created a buzz. The SMEED was then developed for use in other areas of the Army, not just the burn unit. The critical care platform was licensed in 2002 to the New Jersey company Impact Instrumentation, Inc., and the military has purchased hundreds of the SMEEDs (and continue to purchase them). The new and improved critical care platform is utilized by the Army, Air Force and Marine Corps because it's lighter, more adaptable and simply easy to use in emergency evacuation situations. They have been employed in Operation Iraqi Freedom and Afghanistan. There is no doubt about it – the SMEED is saving lives.

Primary Contact: SGT Eric Smeed, NCOIC, Physical Therapy Clinic, Bayne-Jones Army Community Hospital (BJACH), BJACH, 1585 3rd Street, Fort Polk, LA 71459, Phone: 337-531-3023, E-mail: eric.smeed@amedd.army.mil

	FLC Representative Making Nomination	Nominee(s)' Supervisor	ORTA Representative Technology Transfer Program Manager	Lab Director
Name:	Dr. Paul Mele	MAJ Anthony C. Bare	Dr. Paul Mele	LTC Lee Cancio
Address:	504 Scott Street	1585 3 rd Street	504 Scott Street	Institute of Surgical Research
City:	Fort Detrick	Fort Polk	Fort Detrick	Fort Sam, Houston
State/Zip:	MD/ 21702-5012	LA/ 71459	MD/ 21702-5012	TX/ 78234-6315
Phone:	301-619-6664	337-531-3203	301-619-6664	210-916-3301
Fax:	301-619-5034		301-619-5034	
E-mail	Paul.mele@us.army.mil	Anthony.bare@us.army.mil	Paul.mele@us.army.mil	Lee.cancio@us.army.mil

Kepivance®: Improving the Quality of Life for Cancer Patients

National Cancer Institute, National Institutes of Health

Cancer is the second largest cause of mortality in the US, but researchers have made tremendous progress in developing new and effective treatments to reduce these mortalities. The National Cancer Institute's 2015 Challenge Goal is to turn cancer from a killer into a chronic disease in the next ten years. Thus far the progress in our fight against cancer has come at a heavy price in the form of devastating side effects. While they are meant to kill cancer cells, most cancer drugs also destroy normal tissues. Mucositis (painful sores and ulcers in the lining of the mouth) is a common complication of chemotherapy and/or radiation, affecting approximately 80% of patients who undergo this intensive treatment prior to bone marrow transplantation. In this condition, the cells lining the mouth and throat are damaged, making the patients' everyday activities, such as eating, drinking, swallowing and talking, difficult or impossible. They require longer hospitalization, high doses of narcotics such as morphine, and intravenous feeding. Prior to Kepivance®, there was no treatment for this condition.

This invention describes the use of Palifermin, a recombinant human keratinocyte growth factor (KGF) that can be used to reduce the incidence and duration of oral mucositis in cancer patients. Dr. Rubin and his collaborators at NIH discovered the original molecule, realized its importance and filed for patent protection in 1989. Amgen was then chosen as a commercial partner to develop a useful therapeutic with this molecule, because they had worked with other growth factors such as PDGF and G-CSF. Convinced that KGF would fit well in Amgen's product development strategy, NIH granted them an exclusive license to the invention in 1992.

Approved by the FDA in 2004 and sold under the brand name Kepivance®, this is a first of its kind of medicine that directly and effectively addresses the issue of a cancer patient's quality of life and it is bound to inspire other drug developers to introduce such valuable products. Currently this drug benefits approximately 11,000 adult Americans with hematologic malignancies who undergo bone marrow transplantation each year. As other indications are pursued and the medical community realizes the value provided by this treatment to their patients, the number of people benefiting from Kepivance® is bound to multiply. First-of-a-kind drugs generally see a delayed but rather dramatic upswing in usage as practitioners become more comfortable in prescribing them and new uses are developed.

Primary Contact : Dr. Jeffrey S. Rubin, Senior Investigator, National Cancer Institute, National Institutes of Health, Building 37, Room 2042, 37 Convent Drive, Bethesda, MD 20892, Phone: 301-496-4265, Fax: 301-496-8479, E-mail: RubinJ@mail.nih.gov

Other Inventors: Dr. Paul W. Finch, Scientific Consultant
 Dr. Stuart A. Aaronson, Professor and Chairman
 Mount Sinai School of Medicine

	FLC Representative Making Nomination	Nominee(s)' Supervisor	ORTA Representative Technology Transfer Program Manager	Lab Director
Name:	Krishna Balakrishnan	Robert Wilttrout MD	Karen Maurey	Andrew Von Eschenbach, MD
Address:	6011 Executive Blvd., #325	Bldg. 428, Rm. 46 P.O. Box B	6120 Executive Blvd., Suite 450	31 Center Drive, MSC 2580
City:	Rockville	Frederick	Rockville	Bethesda
State/Zip:	MD 20852	MD 21702-1201	MD 20852	MD 20892-2580
Phone:	301-435-3888	301.846.1258	301/496-0477	301.496.5615
Fax:	301-402-0220		301/402-2117	
E-mail	balki@nih.gov	wilttrout@mail.nih.gov	maureyk@mail.nih.gov	vonescha@mail.nih.gov

Identification of Small Molecule Inhibitors of Anthrax Lethal Factors

U.S. Army Medical Research And Materiel Command

Anthrax has recently been the subject of intense interest because of its use as a biological weapon. The inhalation of anthrax spores is usually fatal if it is not properly diagnosed and treated with the antibiotics during the early stages of infection. Unfortunately, the antibiotics that we have today are not always effective, and therefore it has become necessary to formulate a new and more successful treatment for anthrax. To help in this cause and global concern, Microbiotix Inc. has teamed up with the U.S. Army Medical Research and Materiel Command (USAMRMC) and the National Institute of Health (NIH). Maryam Azarion, of USAMRMC, was the key player in the development, negotiation and execution of a patent license agreement between Microbiotix and the U.S. Government. Microbiotix was awarded an exclusive license to develop and commercialize a small molecule that has inhibition activity, to prevent and treat anthrax poisoning. In 2001, five Americans died from anthrax inhaled from contaminated mail. This patent license agreement allows Microbiotix to take the early stage technology developed by Army and NIH scientists and contractors and to further fund and develop it. These additional developments can lead to various potential discoveries in helping to overcome not only anthrax poisoning, but also bacterial resistance overall. Due to the fact that the bacteria can build up resistance to antibiotics, it's a global concern to develop new treatments for bacteria infections as well.

Primary Contact: Ms. Maryam Azarion, Technology Transfer Manager, U.S. Army Medical Research and Materiel Command, 504 Scott Street, Fort Detrick, MD 21702-5012, Phone: 301-619-8643, Fax: 301-619-5034, E-mail: maryam.azarion@us.army.mil

	FLC Representative Making Nomination	Nominee(s)' Supervisor	ORTA Representative Technology Transfer Program Manager	Lab Director
Name:	Dr. Paul Mele	Dr. Paul Mele	Dr. Paul Mele	Dr. Mark Dertzbaugh
Address:	504 Scott Street	504 Scott Street	504 Scott Street	1425 Porter Street
City:	Fort Detrick	Fort Detrick	Fort Detrick	Fort Detrick
State/Zip:	MD / 21702-5012	MD / 21702-5012	MD / 21702-5012	21702-5011
Phone:	301-619-6664	301-619-6664	301-619-6664	301-619-7527
Fax:	301-619-5034	301-619-5034	301-619-5034	301-619-2348
E-mail	Paul.mele@us.army.mil	Paul.mele@us.army.mil	Paul.mele@us.army.mil	Mark.dertzbaugh@us.army.mil

Apparatus and Method for Automated Biomonitoring of Water Quality

United States Army Center for Environmental Health Research

To help protect soldiers from exposure to drinking water supplies contaminated with toxic industrial and agricultural chemicals, U.S. Army Center for Environmental Health Research (USACEHR) employees Mr. Tommy Shedd, Mr. Mark Widder, and Dr. van der Shalie developed an aquatic biomonitor that continuously monitors water using live fish and rapidly identifies toxic conditions caused by a wide range of chemicals or chemical mixtures. Electrical signals generated by ventilatory or body movements of eight fish are received by remote electrodes inside an individual test chamber, conditioned, and interfaced to a computer for continuous, automatic evaluation. Water quality parameters are monitored to aid in the interpretation of fish behavior. Should abnormal activity be detected, the computer notifies appropriate personnel using an autodialer and takes a water sample for future analysis using an automated, refrigerated sampler. Biomonitor data can be remotely accessed for evaluation, and the system requires only about four hours per week of maintenance. The system responds within an hour to most chemicals at acutely toxic concentrations. Laboratory and field evaluations of the biomonitor have been augmented with support from a number of sources, including the U.S. Environmental Protection Agency, the Department of Defense Legacy Program, the U.S. Army Research Development and Engineering Command, and New York City. By providing the ability to continuously monitor water quality and provide rapid identification of developing toxic conditions, the USACEHR aquatic biomonitor significantly improves the Army's ability to protect military personnel from contamination and offers the same capability for civilian users, including water utilities. A license was executed With Intelligent Automation Corporation (IAC) in 2004. A total of 6 units have already been sold commercially and up to 14 additional units are pending future purchase from various public water utilities.

Primary Contact: Mr. Tommy Shedd, Research Biologist, U.S. Army Center for Environmental Health Research (USACEHR), 568 Doughten Drive, Fort Detrick, MD 21702-5010, Phone: 301-619-7576, Fax: 301-619-7606, E-mail: Tommy.Shedd@amedd.army.mil

Second Nominee: Mr. Mark Widder, Research Biologist, USACEHR
 Second Nominee: Dr. William van der Schalie, Biomonitoring Program Director, USACEHR

	FLC Representative Making Nomination	Nominee(s)' Supervisor	ORTA Representative Technology Transfer Program Manager	Lab Director
Name:	Dr. Paul Mele	Dr. Paul Knechtges	Ms. Karen Fritz	LTC Rodger Martin
Address:	504 Scott Street	568 Doughten Drive	568 Doughten Drive	568 Doughten Drive
City:	Fort Detrick	Fort Detrick	Fort Detrick	Fort Detrick
State/Zip:	MD/ 21702-5012	MD/ 21702-5010	MD/ 21702-5010	MD/ 21702-5010
Phone:	301-619-6664	301-619-2332	301-619-2024	301-619-7297
Fax:	301-619-5034	301-619-7606	301-619-7606	301-619-7606
E-mail	Paul.mele@us.army.mil	Paul.knechtges@us.army.mil	Karen.fritz@us.army.mil	Rodger.k.martin@us.army.mil