

21st Century *Research and*
Technology **Fund**

Eighth Report to the Indiana General Assembly
July 1, 2008 – June 30, 2009

21
FUND



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This report is available online at www.21fund.org.

21st Century Research and Technology Fund

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The Indiana 21st Century Research and Technology Fund (21 Fund) was created in 1999 by the General Assembly to stimulate the process of diversifying the state's economy by developing and commercializing advanced technologies in Indiana. The 21 Fund was brought under the leadership of the Indiana Economic Development Corporation in 2005.



Indiana Economic Development Corporation

The Indiana Economic Development Corporation (IEDC) is the state of Indiana's lead economic development agency. The IEDC was officially established in February 2005 to support economic development efforts in the state of Indiana, replacing the former Department of Commerce. The IEDC is organized as a public private partnership, governed by a 12-member board of directors chaired by Governor Mitchell E. Daniels, Jr. The IEDC's chief mission is to grow and retain businesses in Indiana and to attract new businesses to the state.



Letter from the Leadership

Dear Legislator:

We are pleased to provide you with the eighth report to the Indiana General Assembly on behalf of the Indiana 21st Century Research and Technology Fund (21 Fund) and the Indiana Economic Development Corporation (IEDC).

This report includes a complete list of 21 Fund awards and Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR) matching awards made in fiscal year 2008-09, which began July 1, 2008, and ended June 30, 2009. In addition, we have included an overview of the 21 Fund's activities during the previous year and its expanded focus for the future.

During the past fiscal year, the 21 Fund made 11 awards totaling \$16,264,300 to Indiana companies to support the development and commercialization of unique and innovative technologies with market-changing potential. The 21 Fund supported Indiana's life sciences industry with seven awards – totaling \$9,264,300 – made to companies that are creating ground-breaking technologies in the life sciences or health care fields.

In addition to our support of the life sciences, the fund made four awards totaling \$7,000,000 to information technology and advanced manufacturing companies with cutting edge products that will help put Indiana on the forefront of 21st century technological development.

Since being brought under the leadership of the IEDC in 2005, the 21 Fund has invested \$90,864,604 in 69 Hoosier companies.

The past year has seen many challenges for Indiana's small business community, especially access to capital needed to grow their companies. In response to the tough economic environment and sluggish capital markets, our vision has adjusted to focus on innovative companies that are executing their full commercialization rollout plan.



Letter from the Leadership

This new focus will target projects near commercialization that have strong potential to attract private capital and create jobs. We believe that in addition to providing the capital necessary to meet key business and technical milestones, we can offer business development expertise by providing contacts and connections that will help generate new capital thereby leveraging our investments. Offering access to managerial and business know-how as well as generating much needed capital for these companies will not only help them succeed but also show the rest of the nation that Indiana's economic environment for small business is still strong.

We expect future awards to accelerate the path to creating new, high-paying Indiana jobs, create impressive returns on investment, spark exciting new research, and serve as a critical catalyst for the development of products in a wide variety of Indiana industry sectors, including life sciences, advanced manufacturing, and information technology.

In the SBIR/STTR program, the number Phase I matching awards granted to Indiana companies increased from 39 in fiscal year 2007-08 to 54 in 2008-09: a 38 percent increase. The grant money provided through these 54 Phase I awards also rose proportionately, from \$3,677,067 in fiscal year 2007-08 to \$4,859,774 in the past fiscal year, a 32 percent increase.

Along with the Phase I matching program, the SBIR/STTR program also awarded six new Phase II enhancement awards totaling \$2,098,240 to Indiana companies in the past fiscal year.

It is our pleasure to provide you with this report. Please do not hesitate to contact Steve Hourigan, 21 Fund Managing Director, at the IEDC if you have any questions.



E. Mitchell Roob, Jr.
Secretary of Commerce



Steve Hourigan
IEDC Director of Entrepreneurship

21st Century Research and Technology Fund Overview

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The 21 Fund seeks Indiana companies with strong commercialization potential and provides financial support to help them make the transitional leap from product development to commercialization. Through partnerships with private capital, the 21 Fund helps these companies meet essential milestones along the path to commercialization.

Many recent challenges have impelled a revision of the 21 Fund's vision and execution, to focus on optimizing our existing portfolio resources and enhancing commercialization efforts of companies that are likely to create high-paying jobs and attract private capital in the near-term. Our new strategy involves working with companies to establish connections and partnerships and to stimulate the flow of capital, effectively leveraging the state's investment with additional capital from angel investors and venture capital sources. The 21 Fund has implemented this strategic focus to mitigate risk and increase the potential for success.

In parallel with refocusing the fund's tactics, we have divided the awards into two separate opportunities – Initiation Awards and Commercialization Awards – to aid in the decision making process.

The Initiation Award offers up to \$500,000 for companies in the proof-of-principle stage to help obtain follow-on investment while Commercialization Awards provide up to \$2 million in funding to accelerate product development and commercialization.

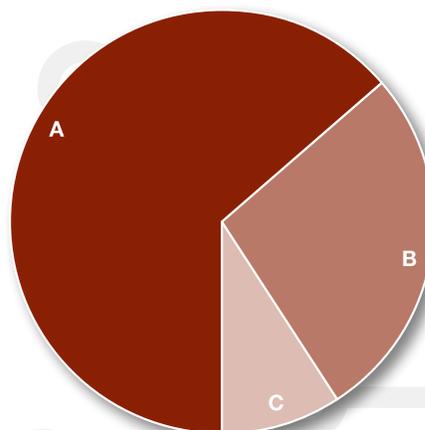
Through the formation of key strategic partnerships, the fund is adding more than just capital to the 21 Fund's award-winning Indiana companies. The value-added by providing connections, contacts, and managerial and business development expertise will ensure success for our portfolio companies, generating new revenue for Indiana and creating high-tech, high-wage jobs for the 21st century.

21 Fund Awards Fiscal Year 2008-09

Company	Industry	Award	City	County	Year
Nanovis, LLC	Life Sciences/Health Care	\$ 2,000,000	Columbia City	Whitley	2008
CSTX, Inc.	Life Sciences/Health Care	\$ 2,000,000	Indianapolis	Marion	2008
PDS Biotechnology Corporation	Life Sciences/Health Care	\$ 2,000,000	Lawrenceburg	Dearborn	2008
SONARMED, Inc.	Life Sciences/Health Care	\$ 500,000	Indianapolis	Marion	2008
Kylin Therapeutics, Inc.	Life Sciences/Health Care	\$ 1,264,300	West Lafayette	Tippecanoe	2008
Aarden Pharmaceuticals, Inc.	Life Sciences/Health Care	\$ 500,000	Indianapolis	Marion	2009
Knowrtal LLC	Information Technology/Software Development	\$ 1,000,000	West Lafayette	Tippecanoe	2009
Truck Emission Control Technologies, Inc. (TECT)	Advanced Manufacturing/Engineering	\$ 2,000,000	Anderson	Madison	2009
Arxan Defense Systems, Inc.	Information Technology/Software Development	\$ 2,000,000	West Lafayette	Tippecanoe	2009
Scale Computing, Inc.	Information Technology/Software Development	\$ 2,000,000	Indianapolis	Marion	2009
SMED-TA/VD, LLC	Life Sciences/Health Care	\$ 1,000,000	Columbia City	Whitley	2009
Total for Fiscal Year 2008-09		\$16,264,300			

Industry Sector Breakdown

- A** Life Sciences/Health Care (7)
- B** Information Technology/
Software Development (3)
- C** Advanced Manufacturing/Engineering (1)



SBIR/STTR Overview

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Indiana's SBIR/STTR programs have continued to stimulate technological innovation and provide opportunities for Indiana small businesses to participate in federally funded research and development in fiscal year 2008-09.

These two competitively awarded, three-phase programs provide qualified Indiana small businesses with opportunities to develop innovative ideas within the context of specific research and development needs of the federal government. These programs stimulate technological innovation, increase private sector commercialization of federal R&D, increase small business participation in federally funded R&D, foster participation by minority and disadvantaged firms in technology innovation, and provide collaborative opportunities for entrepreneurial small businesses at the nation's top colleges and universities.

The 21 Fund matches any SBIR/STTR Phase I awards won by Indiana companies. In fiscal year 2008-09, the IEDC made 54 Phase I awards totaling \$4,859,774. In addition to the Phase I matches, the IEDC also made six Phase II Enhancement awards totaling \$2,098,240 from the Indiana SBIR/STTR Commercialization Enhancement Program.

The IEDC SBIR program initiative has also built a client list of 425 companies. In the past fiscal year, the IEDC responded to a variety of requests from these companies, including: 44 Proposal Assistance requests, two Fast Track Proposals, 49 Proposal Reviews, six Technical Reviews, four Technology Niche Assessments, 151 Phase I Support Letters and 26 Phase II Support Letters.

The IEDC's SBIR/STTR programs reflect a concerted effort to increase Indiana's participation in federal programs, to develop the cutting-edge commercial potential of Indiana's small businesses, and to support the growth of Indiana's high-technology workforce through the creation of high-skill, high-wage jobs. Indiana's SBIR/STTR programs represent major steps toward strengthening our state's commercial landscape and increasing the number of high-tech jobs in Indiana.

SBIR/STTR Awards Fiscal Year 2008-09

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Phase I Matches

Company	Award	City	County	Funding Agency
Aeon Imaging, LLC	\$ 100,000.00	Bloomington	Monroe	NIH
Akina, Inc.	\$ 100,000.00	West Lafayette	Tippecanoe	NIH
Analytical Engineering, Inc.	\$ 69,999.96	Columbus	Bartholomew	DoD
Anderson Tool & Engineering Company, Inc	\$ 80,000.00	Anderson	Madison	USDA
CAE-Net.com	\$ 98,964.00	Carmel	Hamilton	DoD
Conflict Kinetics, LLC	\$ 98,998.00	Merrillville	Lake	DoD
CreateAbility Concepts, Inc.	\$ 75,000.00	Indianapolis	Marion	DoEd
Enabling Energy Systems, Inc.	\$ 99,999.00	Crown Point	Lake	DoD
Engine Research Associates, Inc.	\$ 99,979.00	Fort Wayne	Allen	DoD
En'Urga, Inc.	\$ 100,000.00	West Lafayette	Tippecanoe	DOT
En'Urga, Inc.	\$ 100,000.00	West Lafayette	Tippecanoe	DoD
Forsite, Inc.	\$ 99,945.25	Kokomo	Howard	DoD
GFT, Inc.	\$ 99,442.35	Pennville	Jay	NASA
Hawthorne Mushroom, Inc.	\$ 80,000.00	Montgomery	Daviess	USDA
IBC Materials & Technologies, Inc.	\$ 99,843.00	Lebanon	Boone	DoD
IN Space, LLC	\$ 99,190.00	West Lafayette	Tippecanoe	DoD
IN Space, LLC	\$ 92,486.00	West Lafayette	Tippecanoe	DoD
Information in Place, Inc.	\$ 100,000.00	Bloomington	Monroe	NIH
Innovative Energy Solution, Inc.	\$ 100,000.00	Crown Point	Lake	DoD
Innovative Energy Solution, Inc.	\$ 99,999.00	Crown Point	Lake	DoE
Innovative Energy Solution, Inc.	\$ 99,999.00	Crown Point	Lake	DoE
Innovative Energy Solution, Inc.	\$ 69,999.42	Highland	Lake	DoD
Insects Limited, Inc.	\$ 79,876.00	Westfield	Madison	USDA
Jabiru Software and Services, LLC	\$ 99,792.00	West Lafayette	Tippecanoe	NASA
LewTech Company, Inc.	\$ 69,893.00	Fort Wayne	Allen	DoD
LewTech Company, Inc.	\$ 69,978.91	Fort Wayne	Allen	DoD

Key:

DoC	Department of Commerce	NASA	National Aeronautics and Space Administration
DoD	Department of Defense	NIH	National Institute of Health
DoE	Department of Energy	NOAA	National Oceanic and Atmospheric Administration
DOT	Department of Transportation	USDA	United States Department of Agriculture
EPA	Environmental Protection Agency		

SBIR/STTR Awards

Fiscal Year 2008-09 *(continued)*

Phase I Matches (continued)

Company	Award	City	County	Funding Agency
LewTech Company, Inc.	\$ 69,921.18	Fort Wayne	Allen	DoD
Medical Decision Modeling, Inc.	\$ 100,000.00	Indianapolis	Marion	NIH
MNB Technologies, Inc.	\$ 99,938.00	Bloomington	Monroe	DoD
Mudawar Thermal Systems, Inc.	\$ 29,951.00	West Lafayette	Tippecanoe	DoD
Mudawar Thermal Systems, Inc.	\$ 69,763.21	West Lafayette	Tippecanoe	DoD
Nesch, LLC	\$ 69,996.00	Crown Point	Lake	DoD
Odysian Technology, LLC	\$ 99,998.00	South Bend	St. Joseph	DoD
Odysian Technology, LLC	\$ 99,887.00	South Bend	St. Joseph	DOT
Optosonic, Inc.	\$ 100,000.00	Indianapolis	Marion	NIH
PartTec, LTD	\$ 100,000.00	Bloomington	Monroe	DoE
PharmacoPhotonics, LLC (Fast Diagnostics)	\$ 100,000.00	Indianapolis	Marion	NIH
PhycoBiologics, Inc.	\$ 80,000.00	Bloomington	Monroe	USDA
PreClinOmics, Inc.	\$ 100,000.00	Indianapolis	Marion	NIH
Predictive Physiology & Medicine, Inc.	\$ 100,000.00	Bloomington	Monroe	NIH
Prosolia	\$ 100,000.00	Indianapolis	Marion	NIH
RemSense, Inc.	\$ 99,434.11	South Bend	St. Joseph	DoD
Scientific Methods, Inc.	\$ 70,000.00	Granger	St. Joseph	EPA
SePRO Corporation	\$ 80,000.00	Carmel	Hamilton	USDA
Sha & Associates, Inc.	\$ 100,000.00	Crown Point	Lake	DoE
SkySight Technologies, LLC	\$ 69,954.00	Leo	Allen	DoD
The Academic Edge	\$ 100,000.00	Bloomington	Monroe	NIH
Techshot, Inc.	\$ 94,985.00	Greenville	Floyd	DoC/NOAA
Techshot, Inc.	\$ 99,992.00	Greenville	Floyd	DoD
Techshot, Inc.	\$ 99,958.09	Greenville	Floyd	NASA
Techshot, Inc.	\$ 69,994.20	Greenville	Floyd	DoD
Techshot, Inc.	\$ 98,972.00	Greenville	Floyd	DoD
Trellis Growing Systems, LLC	\$ 73,734.00	Fort Wayne	Allen	USDA
Wavepoint Research, Inc.	\$ 99,912.00	Newburgh	Warrick	DoD
Total for Fiscal Year 2008-09	\$ 4,859,773.68			

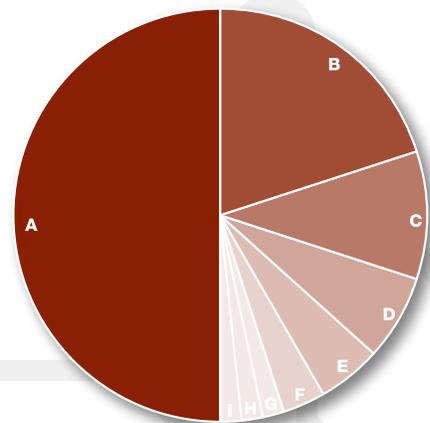
SBIR/STTR Awards Fiscal Year 2008-09 *(continued)*

Phase II Enhancement

Company	Award	City	County	Funding Agency
IBC Materials & Technologies, LLC	\$ 350,000.00	Lebanon	Boone	DoD
Arxan Research, Inc.	\$ 348,240.00	West Lafayette	Tippecanoe	DoD
Arxan Research, Inc.	\$ 350,000.00	West Lafayette	Tippecanoe	DoD
General BioTechnology, Inc.	\$ 350,000.00	Indianapolis	Marion	NIH
IKOtech, LLC	\$ 350,000.00	New Albany	Floyd	NIH
Simulex, Inc.	\$ 350,000.00	West Lafayette	Tippecanoe	DoD
Total for Fiscal Year 2008-09	\$2,098,240.00			

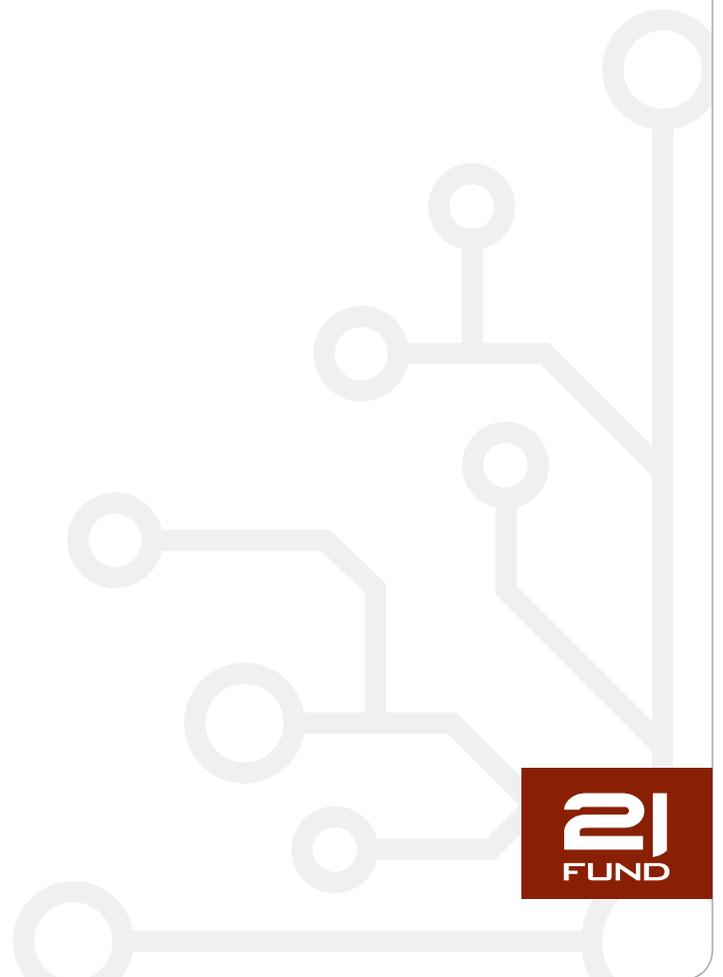
Federal Funding Agency Breakdown

- A** Department of Defense (30)
- B** National Institute of Health (12)
- C** United States Department of Agriculture (6)
- D** Department of Energy (4)
- E** National Aeronautics & Space Administration (3)
- F** Department of Transportation (2)
- G** Department of Commerce/
National Oceanic and Atmospheric Administration (1)
- H** Department of Education (1)
- I** Environmental Protection Agency (1)



Company Profiles

The following pages include success stories about some high-tech Indiana companies that have received 21 Fund Awards and SBIR/STTR Awards.



HealthCall, LLC

21 Fund Recipient

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HealthCall, LLC is a medical communications company, which began providing technology innovation solutions to the health care sector in 1994, and today is the first provider of Automated Patient Response™ solutions for use in disease management, wellness programs, medication compliance, general follow-up and administrative outreach activities.

A \$1.2 million 21 Fund award in 2007 helped take a proof-of-concept prototype into production and subsequent market launch, resulting in 12 jobs.

Company technology automates routine interactions and complex workflows between patients, providers and payers by providing scheduling, decision support, authentication, access encryption, standardized documentation, audit trails and transaction management tools.

HealthCall™ is particularly effective in chronic care. In a recent study, HealthCall™ was used to monitor weight and self-reported signs and symptoms amongst 282 patients diagnosed with heart failure. Such patient monitoring resulted in a remarkable 72 percent reduction in re-admission rates. This illustrates the real-world patient well-being impacts that can result from advances in information technologies.

HealthCall has secured several strategic partnerships and is currently sustaining a 40 percent revenue growth rate. To date, more than 1 million automated patient responses have been transacted on the HealthCall™ network.



HealthCall®

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PDS Biotechnology Corporation

21 Fund Recipient

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PDS Biotechnology Corporation has recently moved to Indiana from Ohio as a result of a \$2 million award from the 21 Fund in support of its development of immunological (vaccine) therapies for some cancer types and infectious diseases.

PDS is bringing to market a unique system that radically enhances the immune response. This makes possible therapies for virus-caused cancers, particularly cervical cancer (caused by the human papillomavirus). This development project involves collaboration of PDS with the National Institutes of Health (NIH) Nanotechnology Characterization Lab.

PDS and NIH are collaborating to undertake preclinical and clinical trials required before product launch. PDS is located at the Ivy Tech facility in Lawrenceburg and is expected to create 90 jobs by 2014.



Scale Computing, Inc.

21 Fund Recipient

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A \$2 million 21 Fund award to Scale Computing, Inc. has been crucial to developing the broad, multi-source financing required to attract this dynamic information technology company to Indiana and bring the company's experienced management team and manufacturing operations from Silicon Valley to Indiana.

The 21 Fund award, in conjunction with funding provided by Blue Chip Venture Co. and other regional venture-capital firms, is part of \$5 million public-private funding secured by the company.

Scale Computing has developed Network Resource Virtualization technology, which allows for the abstraction of the computer hardware resources of an entire network into a single, scalable, easy-to-use computing platform, or "cloud."

Funding from the 21st Century Fund is intended to assist in the commercialization of this technology from the lab into a fully viable product line of network servers with a fully functional corporate infrastructure in place to support the launch of those products. The early success in securing a major IT company's resellers to position Scale's product as the preferred platform solution for the small- to medium-size business market validates Scale's rapid growth model.

Scale Computing's technologies permit the economical and simple addition of computer resources as needed, which eliminates complex reconfigurations typically needed when a business demands additional server capacity. This enables computer-intensive companies to better match resources with needs, rather than over-build in anticipation of future business growth, and thus enjoy substantial cost savings.

The Scale Computing project is typical of the quickly evolving information technology sector, which requires rapid deployment of resources to ensure stability as new hardware and software technologies are brought to market. The expected jobs growth trajectory for Scale is steep, involving as many as 67 jobs in the next two years.



SCALE
COMPUTING



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Therametric Technologies, Inc.

21 Fund Recipient

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Therametric Technologies, Inc. continues to accelerate its FluoreCam technology into the dental equipment market.

The 21 Fund initially provided \$1.6 million to support the company's early dental cavities detection system in 2000. That support led to transfer of the underlying technology from the Netherlands to begin device prototype creation and testing in Indiana.

This investment was leveraged by a number of awards by the National Institutes of Health to Therametric in support of extensive clinical testing. The IEDC Small Business Innovation Research office provided three matching awards to Therametric during these trials. In 2006 the 21 Fund provided a further \$646,020 to support final prototype design work leading to U.S. Food and Drug Administration approvals.

Therametric is now preparing to expand its manufacturing capabilities and its Indiana workforce from 16 to 56 by 2013. This expansion begins with an investment of \$4 million to construct a 26,000-square-foot facility in Noblesville. This transition to manufacturing is further supported by IEDC and Noblesville tax credit and workforce training incentives.

Therametric is illustrative of the long-term technology development campaigns of life sciences companies as their innovators and entrepreneurs move from ideas to products. Therametric also illustrates the long-term rewards for early state support of innovation.



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Truck Emission Control Technologies

21 Fund Recipient

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Truck Emission Control Technologies (TECT) is a Michigan company moving to Anderson as a result of synergies created by a \$2 million 21 Fund award and local incentives. In addition to financial resources, the Anderson area is able to provide this dynamic company with a highly skilled workforce. Job growth potentially could reach 140 employees within five years.

TECT's radically new, low-cost diesel particulate filter system, with passive features using no precious metal, provide fail-safe and durable exhaust treatment products with competitive advantages in a wide range of diesel applications for both retrofit and original equipment manufacturer markets.

The cornerstone of the company's product offerings is a proprietary "diesel particulate converter," which removes very high levels of particulate matter in combination with a diesel oxidation catalyst to reduce hydrocarbons and carbon monoxide.



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En'Urga, Inc.

SBIR/STTR Award Recipient

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Founded in 1994 in West Lafayette, En'Urga, Inc. has received a total of 17 Phase I SBIR and three Phase II SBIR grants from various agencies over the past 15 years. Before the IEDC matching program, SBIR grants and funded research comprised approximately 90 percent of company revenues.

With the help of the IEDC matching program (seven matches so far), the company has been able to move its products into commercialization. More than 50 percent of its revenues are currently from product sales and less than 20 percent are from grants and funded research.

En'Urga makes highly specialized diagnostic equipment for the quality audit of components manufactured by aerospace, automotive, pharmaceutical and consumer product companies. Three company products have been commercialized: The first is an imaging spectrometer for studying high temperature processes that occur in furnaces and engines; the second is an optical patternator that provides quality audit of all types of industrial nozzles and injectors; and the third is a velocimeter for characterizing two phase flows from atomizers. All three products were made possible with SBIR and SBIR matching funds.

En'Urga products are typically high-value, low-volume products that require specialized personnel to design, fabricate, install and service them. The company has employed highly skilled personnel at its West Lafayette facility for the last eight years, which has significantly added to the local tax base. Continued company employment has been made possible with the help of SBIR matching funds, particularly during years when product sales were low.

En'Urga has sold its Indiana-made products in several countries around the world, including India, Korea, Japan, China, Denmark, France and Canada.



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Foresite, Inc.

SBIR/STTR Award Recipient

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Foresite, Inc. is a consulting and analytical test laboratory dedicated to solving product reliability issues created when electronic manufacturing process residues and surface contaminants degrade field performance.

The U.S. Department of Defense Missile Defense Agency awarded Foresite in February 2009 an SBIR Phase I contract to continue and advance Foresite's research into the role of surface contamination in tin whisker nucleation and growth on electronic components and assemblies. The IEDC matched this \$99,945 award. The ultimate SBIR Phase II goal is the development of an accelerated test method to determine the proclivity of a surface to develop tin whiskers.

Tin whiskers are hair-like projections that grow from a surface and can interfere with electronics. The impact of whisker growth on the reliability of electronics has been exacerbated by environmentally driven efforts to eliminate lead from tin plating and solders. Even exempt applications, such as military, are affected due to process, logistic and economic supplier realities. The reasons that whiskers grow are still not fully understood, and test methods, especially accelerated ones, do not correlate well with field experience. Foresite research indicates a correlation between ionic residue levels and whisker growth, given prerequisite conditions, such as stress.

The IEDC enabled Foresite to expand on its capability, hire three new employees, and sustain research during the gap between the Phase I final report and the upcoming Phase II MDA award. IEDC funding support has been instrumental in increasing the probability of a Phase II proposal invitation and subsequent award.



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General BioTechnology, LLC

SBIR/STTR Award Recipient

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General BioTechnology, LLC will use a \$350,000 SBIR grant to further develop and test its Advanced CryoTechnology cell washing device, a product which could alleviate negative side effects during stem cell transplants for cancer patients.

The Indiana grant was matched with more than \$1 million in federal funding, which will enable the company to develop its device for clinical use. The company plans to begin a pilot safety study of the technology in 2010 before a larger clinical trial later.

General BioTechnology's device, which is similar in size to a microwave oven, pumps bone marrow stem cells through a specially designed tube. The fiber filled tube gradually filters the Dimethyl Sulfoxide (DMSO) preservative from the life saving bone marrow transplant while still maintaining the cell's efficacy. DMSO is a commonly used preservative which increases the shelf life of cells, but can cause complications with patients when it is injected into their system.

Beyond this initial trial for bone marrow, ongoing company research involves using the cell washing device to more effectively remove glycerol from standard frozen blood, making it more accessible to a wider pool of patients.

According to the National Heart, Lung and Blood Institute, there are currently more than 5 million blood transfusions performed in this country per year, mostly using fresh blood which spoils in about one month using standard storage techniques. Frozen blood can be stored for years without expiration, but current methods of administering frozen blood can take up to three to four hours. With General BioTechnology's device, administering frozen blood could be done in only 30 minutes.

The company anticipates commercializing the device to the bone marrow stem cell transplant markets in late 2010 before fully launching the product to blood centers throughout North America in 2011.



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IBC Materials & Technologies, Inc.

SBIR/STTR Award Recipient

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IBC Materials & Technologies, Inc. is a nano-technology surface engineering and manufacturing company located in Lebanon.

Under two Air Force SBIR awards, IBC is developing new plasma surface enhancement solutions for aerospace components made of lightweight alloys, such as aluminum, titanium and magnesium. IBC is developing wear and corrosion resistant diffusion ceramic coatings using the Micro Plasma Oxidation (MPO) process, which converts the surface of lightweight alloys to a hard ceramic.

IBC is currently working with several customers to apply the MPO ceramic coating technology to improve wear performance and provide cost savings for aerospace and defense systems. IBC is working with Rolls-Royce Corp. to apply the MPO ceramic coatings to the Joint Strike Fighter (F-35) lift fan gearbox in order to reduce cost and weight for the Short Take-Off Vertical Landing version aircraft.

IBC has received two Phase I and one Phase II matching grants under the SBIR and ISCEP programs, for a total investment of \$550,000. These funds have been instrumental to IBC's technology development and commercialization efforts in several key areas, which are necessary to achieve commercialization and sales.

Through SBIR program support, IBC has hired and retained three new high-wage technical positions. Within 12 months, IBC plans to add additional personnel to its research and development and production staffs based on pending new contracts with several major companies. IBC is investing a total of \$1.5 million to \$2 million between 2008 and 2010 to improve facilities and production capacity.



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The logo for the 21st Century Fund. It consists of a large, stylized number "21" in white, with the word "FUND" in a smaller, white, sans-serif font directly below it. The logo is set against a dark red, rounded square background. The entire logo is positioned in the bottom right corner of the page, partially overlapping a light gray circuit board graphic that runs diagonally across the lower right portion of the page.

Trellis Growing Systems, LLC

SBIR/STTR Award Recipient

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Berries, fruits and vegetables have been grown on trellis wires for centuries. Training on trellis wires positions the canes, branches or vines for optimum growth and productivity by improving exposure to sun, opening the leaf canopy for air circulation, and improving spray coverage, leading to improved fruit harvests.

Trellis Growing Systems, LLC of Fort Wayne, used a Phase I U.S. Department of Agriculture-SBIR grant to prove the feasibility of a novel modular trellising system for raspberries and blackberries. The company completed its Phase I research in December 2008 and successfully applied for a Phase II USDA-SBIR grant.

There are presently limited trellising options for the growers beyond simple static posts and wire systems. Available trellis hardware and systems which enable the growers to better manage their bramble plantings can greatly increase profits and expand acreage of bramble plantings throughout the country.

The development and commercialization of economical trellis components which can be configured into sophisticated designs to meet a grower's specific needs will facilitate commercial expansion of brambles into colder climates and introduce new opportunities for both the grower and consumer. Grower opportunities include a longer growing season, increased sun protection through the addition of shading fabric, increased profits through reduction in labor for pruning, training and harvesting and higher yields.

Trellis Growing Systems' Phase II SBIR research is a continuance of Phase I and will include research, product testing, beta testing of product and preparation for commercialization. Without IEDC matching funds for Phase I, the company would not have had the resources to continue critical research. SBIR funds helped facilitate a smooth transition without losing critical research momentum.



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21st Century Research and Technology Fund

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21st Century Research and Technology Fund

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