



OCAST IMPACT REPORT 2011
UNCOVERING THE BRILLIANCE IN OKLAHOMA



OCAST»



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Oklahomans have thousands of great ideas. Like a geologist sifting through rocks, OCAST carefully examines these brilliant ideas to find the ones with the most potential for economic benefit to our state.

Many Oklahomans would be surprised to hear about some of the groundbreaking, globally-recognized work being done in Oklahoma. Cures and treatments for dreaded diseases, processes to improve the efficiency of energy production and technology innovations to help the military ensure our safety are all being developed by Oklahomans. But even the best ideas can struggle when they first begin. That is where OCAST comes into the picture.

Just as a geologist sifts through rocks to find precious stones, OCAST identifies ideas that have the greatest potential for return to our state – those that have the most promise of commercial success. Once we identify those ideas, we provide companies and researchers with

early stage funding to develop their ideas so that federal agencies, national foundations and private investors take notice – giving the companies sometimes millions of dollars to move their ideas to realization. This money allows Oklahoma companies to bring new jobs, products, tax revenue and a better quality of life to our state.

As you read through this report and see some of the shining examples of Oklahoma companies, you'll find that science and technology touches all corners of our state and advances each industry sector. From energy to agriculture and from health to manufacturing, an investment in science and technology is an investment in Oklahoma's future.

Michael Carolina

Michael Carolina
Executive Director

HOW IT ALL ADDS UP

3,140

JOBS CREATED or retained by OCAST-supported organizations in FY 2010.

200

PATENTS FILED and 137 patents awarded to Oklahoma companies in FY 2010.

122

INVENTORS ASSISTED through the Inventors Assistance Service in FY 2010.

2,258

PROJECTS FUNDED since the inception of OCAST in 1987.

\$3.9 BILLION

CUMULATIVE FINANCIAL IMPACT. Leveraged financial impact of OCAST supported programs since 1987.

\$47,932

AVERAGE SALARY reported by participants in OCAST supported programs is 30% above the per capita income in Oklahoma.

60

PROJECTS FUNDED in FY 2010.

19:1

CUMULATIVE RETURN RATIO. For every dollar invested by OCAST into an Oklahoma company, \$19.94 is attracted to the project from private and federal funds.

\$17.6 MILLION

FUNDS AWARDED IN FY 2010. Amount awarded to Oklahoma businesses, universities and nonprofit research foundations.

150

QUALIFIED, UNFUNDED PROJECTS. Due to limited state funding, OCAST cannot support all of the qualified Oklahomans who apply – 150 qualified Oklahoma projects went unfunded in FY 2010. The amount of money needed to fund all of the promising research and development projects in FY 2010 was \$24 million.

RETURN ON INVESTMENT TO OKLAHOMA

FISCAL YEAR 2010 ANNUAL IMPACT

Program	Award Amounts	Leveraged Private and Federal Funds and Business Financials	Ratio
Applied Research	\$4,222,481	\$90,949,094	21.54
Health Research	\$4,172,812	\$17,326,022	4.15
Inventors Assistance	\$175,750	\$60,000	0.34
Manufacturing Alliance	\$1,269,125	\$167,776,373	132.2
Nanotechnology Applications	\$950,419	\$9,842,388	10.36
Plant Science Research	\$697,089	\$6,724,925	9.65
Seed Capital	\$3,389,497	\$5,980,000	1.76
Small Business Research	\$198,576	\$10,235,671	51.55
Technology Business Finance	\$669,800	\$28,600,000	42.7
Technology Commercialization	\$1,896,866	\$31,399,364	16.55
TOTALS	\$17,642,415	\$368,893,837	
LEVERAGE RATIO			20.91

CUMULATIVE IMPACT 1987-2010

Program	Award Amounts	Leveraged Private and Federal Funds and Business Financials	Ratio
Applied Research	\$74,255,190	\$1,217,013,148	16.39
Health Research	\$63,883,305	\$308,717,694	4.83
Inventors Assistance	\$2,086,471	\$1,736,000	0.83
Manufacturing Alliance	\$15,491,345	\$1,678,045,601	108.32
Nanotechnology Applications	\$2,441,556	\$38,379,936	15.72
Plant Science Research	\$1,364,218	\$9,908,384	7.26
Seed Capital	\$5,731,384	\$20,978,211	3.66
Small Business Research	\$4,108,186	\$209,901,744	51.09
Technology Business Finance	\$8,238,304	\$236,627,484	28.72
Technology Commercialization	\$18,803,089	\$194,949,676	10.37
TOTALS	\$196,403,048	\$3,916,257,878	
LEVERAGE RATIO			19.94



MANUFACTURING INNOVATIONS



“Ranchers sometimes don’t realize the amount of feed that is lost to wild hogs and other wild animals. The stolen feed really adds up financially and is a problem seen all across the country.”

[Bear Runyan, 3C Cattle Feeders, Mill Creek, Oklahoma](#)

Bear Runyan ran a successful small business, manufacturing cattle feeders in Mill Creek, Oklahoma. But when his company received more than \$400,000 in federal grant money to research how to improve one of their feeders, the future growth potential of 3C Cattle Feeders stretched beyond his expectations. The money the company received was part of the federal Small Business Innovation Research (SBIR) program.

The Oklahoma State University New Product Development Center and Runyan have been recipients of multiple federal SBIR grants allowing them to modify one of the company’s traditional cattle feeders to deter wild hogs and other animals from scavenging food and spreading diseases. Traditional cattle feeders do not have a way to keep out other animals.

Through a connection with the Oklahoma Manufacturing Alliance, 3C Cattle Feeders was introduced to the OSU New Product Development Center. The center has worked with them to improve their current product line, develop their idea, write SBIR grants, conduct further research after receiving the grants and create a business plan to market new feeders.

“While the SBIR funding enables a company to do things a small business could never dream of doing on their own, the real benefit comes from working through the process,” said Dr. Daniel Tilley with the OSU New Product Development Center. “The process of applying for the grant makes a company start thinking differently about how they do business, how to improve their products and how to fulfill a need in the market.”

Because the federal SBIR application is time consuming, requiring staff time to complete the grants, OCAST provides bridge funding to financially help a company through the application process.

“OCAST provides matching funds, a financial incentive for companies to hire an intern to work on research and development projects. It helps the students gain excellent experience, Oklahoma companies find potential employees and it gives the universities a competitive advantage.”

Dr. Surendra Singh, University of Tulsa

It has been nine years since electrical engineering professor Dr. Surendra Singh began applying to the OCAST R&D Intern Partnerships program. His goal was to help engineering students at the University of Tulsa apply engineering practices through internships at highly specialized and technical engineering corporations.

At the encouragement of Dr. Singh, Andre Leone, an engineering physics graduate, participated in the program. He is now an electronics engineer with Tinker Air Force Base where he maintains and develops communication and navigation systems. He is pursuing a master’s degree in electrical engineering from the University of Oklahoma. The career was a perfect transition from his internship at Qual-Tron where he tested intrusion-detecting ground sensors and developed underwater sensors for military and homeland security use. This sensor research led to the improvement of an existing product that has been sold to the U.S. Department of Defense and internationally to allies in Canada and European countries.

“My experience in the OCAST internship program provided me an amazing learning environment at Qual-Tron. Most people have to work for years after college before participating in such a career-defining experience,” said

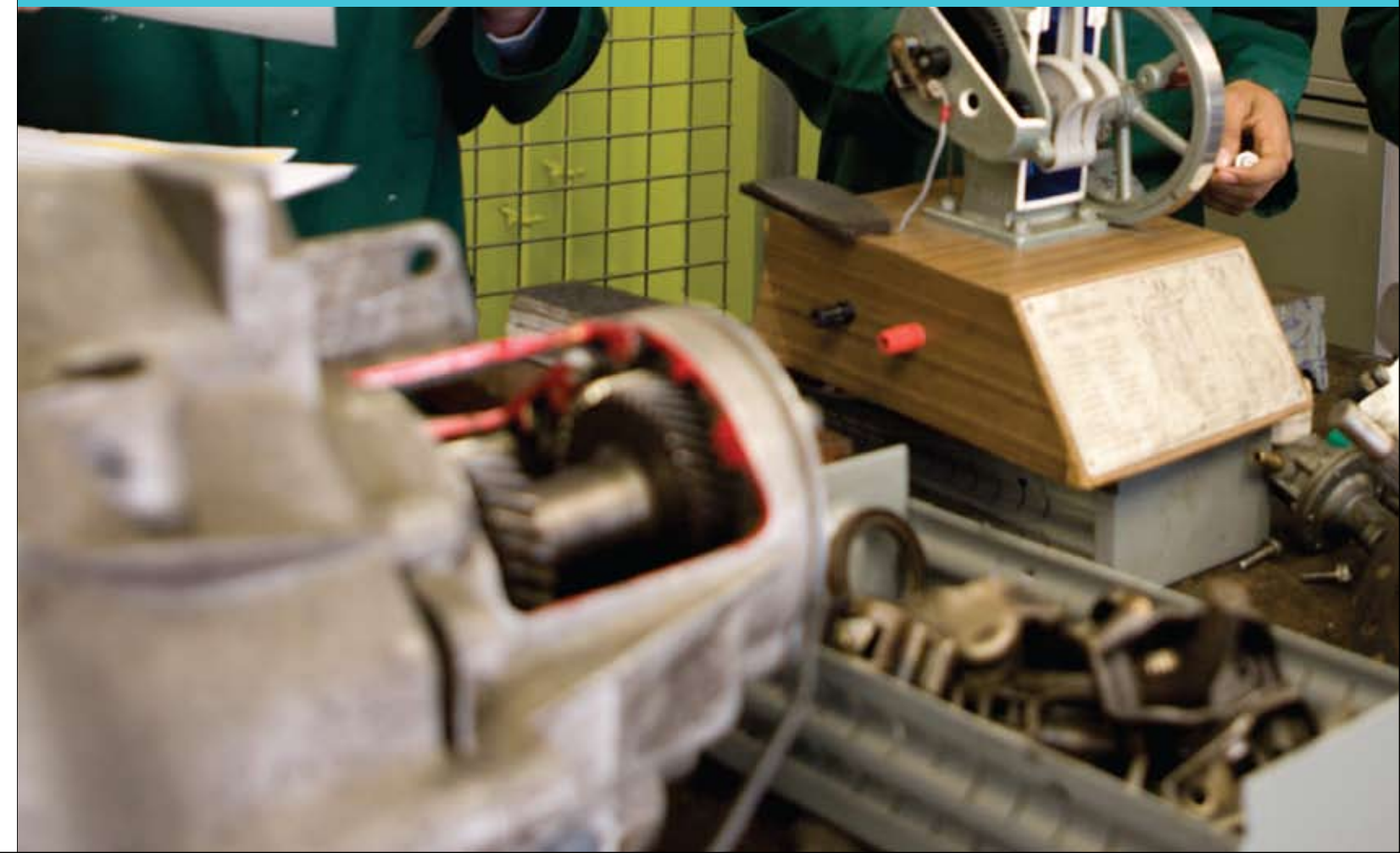
Leone. “I have no doubt it’s what set me apart and helped me land such a great job at Tinker.”

The internship program helped Qual-Tron develop five new positions for a total of \$200,000 additional annual payroll. Other companies have participated in the internship program including Tulsa’s John Zink Co., that has added two new jobs for a total of \$120,000 annual payroll, and Railroad Signal International, that reports a \$1 million impact on its gross sales as a result of the OCAST internship program.

Since 1998, 532 students have completed the R&D Intern Partnerships program at schools across the state including Cameron University, Langston University, Northeastern State University, Oklahoma City Community College, Redlands Community College, Southwestern Oklahoma State University and the University of Tulsa.



PROMOTING EDUCATION





LEVERAGING NATURAL RESOURCES



“Without OCAST, we’d still be in the testing phase. OCAST enabled us to speed up our research, attract an international company to the state and create jobs. Out of all the states I’ve worked in, OCAST is the best technology-based economic developer.” [Terry Brix, Brine Electric, Vici, Oklahoma](#)

Terry Brix has a philosophy – develop businesses that are based on natural resources so the company can’t move itself, its money or its jobs out of state. Oil and natural gas probably come to mind when you think of Oklahoma businesses based on natural resources, but Brix saw something that most overlook or consider waste.

When oil and gas are extracted from the earth, a waste product called “brine” often remains. Brine is essentially salt water, and oil and gas companies must pay to properly dispose of it. Brix developed a process to extract iodine from the brine. The chemical iodine has many uses, including in pharmaceuticals that allow doctors to screen for cancers where X-rays can’t normally see, in electronics such as plasma screens and in your daily diet in the form of iodized salt.

And Oklahoma is the only state in the nation with commercial quality and quantities of iodine.

Once Brix developed the process to extract iodine from brine, his company, Brine Electric in Vici, applied for OCAST funding to build and test a mobile plant.

Brix reached out to the world’s largest privately held agrochemical company, Arysta LifeScience, because they have a product that uses iodine. He convinced Arysta to come to Oklahoma instead of Chile for their iodine. The OCAST funding helped solidify Arysta’s decision to come to the Sooner state because Oklahoma was willing to invest in the research.

The OCAST funding allowed Brine Electric and the newly formed Arysta LifeScience Technology, a sister company of Arysta LifeScience, to test and prove the mobile plant which led Arysta to build an iodine extraction plant in Alva.

The plant in Alva is the first new iodine extraction technology commercialized in the U.S. in 35 years. The estimated capital investment related to this project is \$2.4 million.

Eastern red cedars are not a welcome sight for most Oklahoma farmers and ranchers. Their encroachment causes the displacement of native plant and wildlife species and reduced livestock forage production, estimated at a \$205 million loss for cattle foraging alone. Because of their size and flammability, they pose the threat of accelerating a prairie grass fire into a catastrophic wildfire.

Yet for most farmers and ranchers, it's cost prohibitive to have these invasive trees removed from large acreages. Enter Dr. Rodney Will. His plan is to turn the invasive red cedar into a commercial product that will hopefully pay for the cost of its own removal.

Dr. Will, associate professor for the Department of Natural Resource Ecology and Management at Oklahoma State University, has received OCAST funding to show how turning the invasive trees into gardening mulch is a financially viable option.

But first he had to convince landowners, homeowners and gardeners of the idea.

His team's research has included comparing seven common wood-based mulches to red cedar mulch. The team examined the rate of decomposition of each mulch type, observing the soil's moisture, temperature, nutrients and pH and monitored for termites, insects and plant growth for various annuals, perennials and trees. He's also tested for aesthetics, finding red cedar mulch ranked highest for its attractive color and appearance.

“If we can show that the removal of red cedar could pay for itself, the threats and problems that these invasive trees pose to Oklahoma's farmers and ecosystem could be reduced.”

[Dr. Rodney Will, Oklahoma State University, Stillwater, Oklahoma](#)



IMPROVING AGRICULTURE



Photo courtesy of Oklahoma State University.



ADVANCING HEALTH



“The OCAST award was instrumental in funding the work that led us to these findings. The significant broad-reaching implications of this \$135,000 OCAST-funded work contributed greatly to the conception and design of the two Department of Defense grants of more than \$1.5 million.” [Dr. Kelly Standifer, University of Oklahoma Health Sciences Center, Oklahoma City](#)

Imagine turning off inflammation, and some of the painful conditions it causes such as arthritis and fibromyalgia, as easily as you turn a light on or off. An Oklahoma researcher has discovered the way one natural brain substance impacts a signal that tells a cell how to respond to its environment.

Dr. Kelly Standifer, professor and chair of the department of pharmaceutical sciences at the University of Oklahoma Health Sciences Center, and her team of researchers were awarded OCAST funding to study how this naturally occurring brain substance called a peptide reduces the “addictive” potential of often-abused drugs such as morphine and alcohol.

In the course of those studies, Dr. Standifer and her team discovered that this peptide in the brain (nociceptin) turns on a pathway in the body that is involved in the body’s response to stress and inflammation. If this process can be modulated by drugs that mimic or block the actions of nociceptin, then it may be possible to regulate inflammation.

Millions of sufferers of common inflammation-related disorders and diseases including fibromyalgia, rheumatoid arthritis and orofacial or visceral pain

could benefit from the discovery of this new potential anti-inflammatory target.

Dr. Standifer’s research findings from the OCAST-funded project caught the attention of the Department of Defense. They are interested in how regulating the inflammation process could reduce swelling and long term damage from brain injuries caused by explosive devices and sudden impacts and reduce the severity of Post Traumatic Stress Disorder symptoms and chronic pain.

The department of pharmaceutical sciences at the OU Health Sciences Center also has benefitted from the availability of OCAST awards as a potential source of funding for new faculty members. Just last year, they recruited three new faculty members in highly specialized pharmaceutical science fields from research institutions in other states, to continue their research on funded projects as well as bring in more funding for future discoveries.

OKLAHOMA HOSTS NATIONAL SBIR CONFERENCE Oklahoma was selected to host the national Small Business Innovation Research Conference in November 2010. More than 500 leaders from federal agencies and small businesses attended the event to learn about the federal funding program. OCAST provides technical and financial assistance for Oklahoma businesses applying for this funding.

NOBLE FOUNDATION EXPERIMENT LAUNCHED INTO SPACE On April 5, 2010, the Space Shuttle Discovery launched from Kennedy Space Center, carrying a Noble Foundation experiment in its scientific cargo. Elison Blancaflor, Ph.D., a principal investigator and associate professor at the Noble Foundation, is one of three scientists nationwide to receive a two-year NASA grant that included an opportunity to rocket his plant science research into orbit. Launching the seedlings into space will enable Blancaflor to evaluate how the lack of gravity affects the growth and development of plants. NASA is interested in understanding how plants develop in space because plants are an important component of regenerative life support systems, providing sources of oxygen and food if humans were to embark on long-term space missions.

OTHER OKLAHOMA SCIENCE AND TECH ACCOMPLISHMENTS IN 2010

i2E RECOGNIZED NATIONALLY WITH SSTI AWARD i2E, funded by OCAST, was one of four organizations named winners of the State Science and Technology Institute's 2010 Excellence in Technology Based Economic Developer Award, serving as national models for states and regions investing in science, technology and innovation to grow and sustain their economies and create high-paying jobs.

OKLAHOMA DEFENSE RESEARCHER RECEIVES NATIONAL ATTENTION James Grimsley's work on unmanned aerial vehicles has garnered national attention and was featured in both *Defense Technology International* and *Aviation Week* magazines. Development of micro air vehicles that look like birds, but are actually robots able to spy on enemies while blending in with nature, will allow military personnel to see in dangerous locations without being detected.

SELEXYS RECEIVES LARGEST SBIR GRANT Selexys Pharmaceuticals, a company that has received funding from OCAST, received a \$3.12 million and a \$3.2 million SBIR grant from the National Institutes of Health, collectively among the largest grants received by an Oklahoma company in the history of the SBIR program.

MANUFACTURING ALLIANCE RANKED AMONG THE MOST EFFECTIVE The Oklahoma Manufacturing Alliance, as part of the national Manufacturing Extension Partnership, is continuously reviewed by the National Institute of Standards and Technology to ensure a high return on investment. The latest quarterly review rated the Oklahoma Manufacturing Alliance a perfect 100 percent and they are routinely among the most effective MEP centers nationwide.

EDMOND MANUFACTURER EARNS QUALITY MAGAZINE'S 2010 PLANT OF THE YEAR Pelco Products in Edmond, a client of the Oklahoma Manufacturing Alliance, was named *Quality Magazine's* 2010 Plant of the Year. Pelco Products manufactures traffic signal hardware, utility products and decorative outdoor lighting.

RESOURCES FOR BUSINESSES AND RESEARCHERS

The following OCAST programs and strategic partners are available to help Oklahoma businesses and researchers prove their ideas, attract additional funding and take their products to market. For specific program requirements, funding levels, application deadlines or more information, contact OCAST.



i2E – i2E was created to respond to an OCAST initiative and is a private not-for-profit Oklahoma corporation focused on wealth creation by growing the technology-based entrepreneurial economy within our state. i2E operates under contract with OCAST to administer the Oklahoma Seed Capital Fund, Oklahoma Technology Commercialization Center and the Technology Business Finance Program.



INVENTORS ASSISTANCE SERVICE (IAS) – It's a long, winding path from invention to marketplace. IAS navigates the process through education, information and referrals.



OCAST SEED CAPITAL PROGRAM – OCAST has contracted with i2E to invest in its private-sector seed capital fund. The i2E fund was created to invest in Oklahoma high-tech companies that need hard-to-find capitalization at this stage of commercialization.



OKLAHOMA APPLIED RESEARCH SUPPORT (OARS) – Cutting edge research leads to commercially successful products, processes and services. OARS funds research in all fields from medicine and agriculture to energy and manufacturing.

OKLAHOMA HEALTH RESEARCH (OHR) – Oklahomans are developing treatments and conducting research to help people live longer, healthier lives. OHR funds research projects related to human health.

OKLAHOMA MANUFACTURING ALLIANCE – Small and medium-sized manufacturers must implement new technology and modernize in order to compete successfully in a global economy. The Alliance connects manufacturers to cost-effective resources, more efficient manufacturing processes and technology to increase productivity and reduce costs.

OKLAHOMA NANOTECHNOLOGY APPLICATIONS PROJECT (ONAP) – Oklahoma scientists have big ideas for small, enabling technologies. Nanotechnology will impact all aspects of life by making products stronger, smaller, faster and more durable. ONAP assists Oklahoma companies with the process of applying nanotechnology through research and development to improve or create new products or processes.





OKLAHOMA PLANT SCIENCES RESEARCH (OPSR) – Plant science research is playing a growing role in developing advancements in health, energy, agriculture and defense. OPSR funds basic and applied plant science research.



OKLAHOMA TECHNOLOGY COMMERCIALIZATION CENTER *under contract with i2E* – The Tech Center works with companies, inventors, entrepreneurs and researchers to turn technological innovations into business opportunities for Oklahoma.



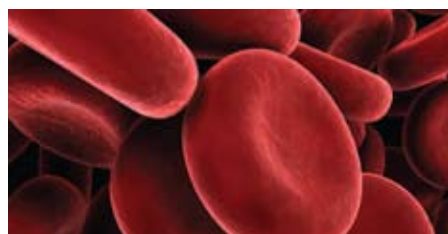
R&D INTERN PARTNERSHIPS (RDIP) – Internships are vital to keeping talented undergraduate students in Oklahoma. RDIP supports R&D projects that involve Oklahoma industry and Oklahoma institutions of higher education by providing matching funds to support internship positions.



SMALL BUSINESS RESEARCH ASSISTANCE (SBRA) – Small business owners and entrepreneurs sometimes need help to apply for the federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. The OCAST program defrays a portion of federal proposal preparation costs, provides critical “bridge” funding between Phase I and Phase II and provides technical assistance.



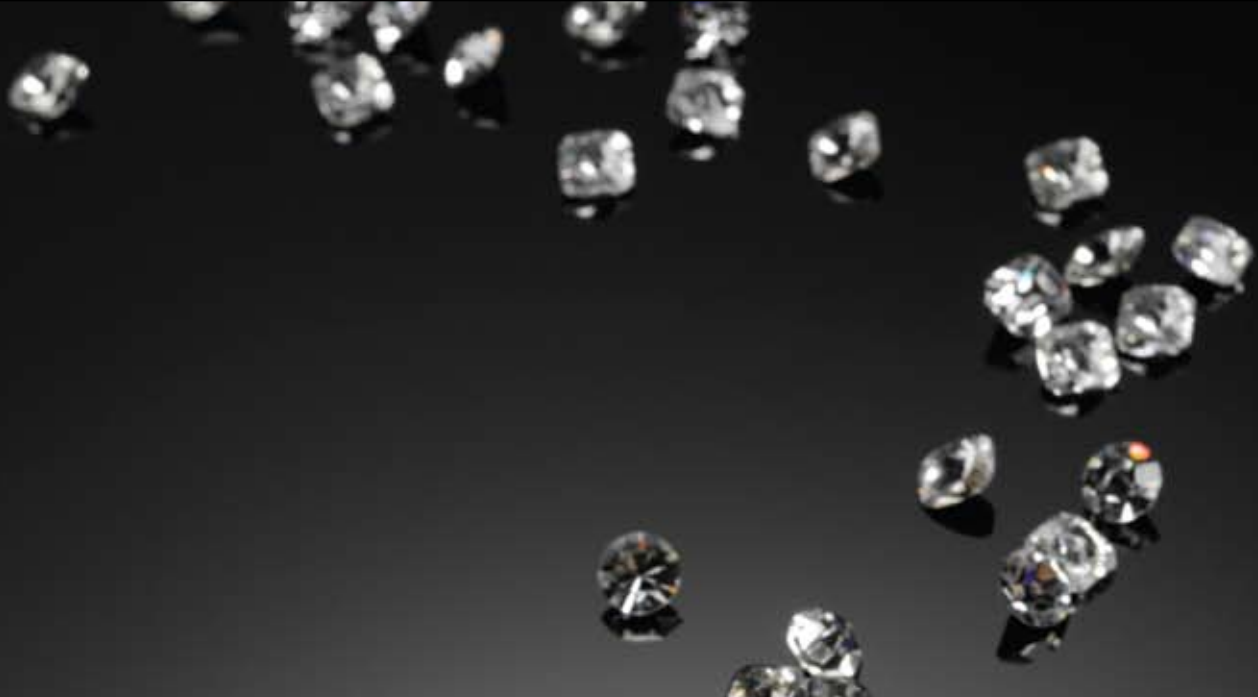
TECHNOLOGY BUSINESS FINANCE PROGRAM (TBFP) *under contract with i2E* – Financing a new business can be challenging. TBFP provides technology start-ups with pre-seed financing and early-stage risk capital to stimulate investments from private sources.



TECHNOLOGY BUSINESS INCUBATOR – OCAST in partnership with the Oklahoma Health Center Research Park Corporation helps to provide services to meet the needs of Oklahoma start-up, technology-intensive firms including but not limited to biotechnology and biomedical firms.

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OKLAHOMA CENTER FOR THE ADVANCEMENT OF SCIENCE AND TECHNOLOGY

755 Research Parkway, Suite 110
Oklahoma City, Oklahoma 73104
Phone: 405-319-8400
Fax: 405-319-8426

700 N. Greenwood Ave., Suite 1400
Tulsa, Oklahoma 74106
Phone: 918-594-8118
Fax: 918-594-8413

Toll Free: 866-265-2215
E-mail: info@ocast.ok.gov
www.ocast.ok.gov

