Innovation Texas

Summer 2009

The official magazine of the Texas Healthcare and Bioscience Institute

Texas: A Formula for Success


Every year, the Life Sciences industry provides resources for a better life. Austin is returning the favor.
monebo
Monebo developed a wireless cardiac monitoring system to help keep hearts healthy—while Austin's numerous hike and bike trails do the same.
Austin is the perfect fit for any company in the life sciences arena. Just ask any of the more than 100 companies located here. You'll find quickly that our talent pool and readily accessible resources make Austin the place where innovations are made.
To find out why Austin would make a great home for you, call the Austin Chamber of Commerce at 512.322.5608. Or check out our web site at www.austinchamber.com/favor-it.html.
Austin
TheHumanCapital

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Innovation Texas

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This issue of Innovation Texas features an article about how the Lone Star State is setting itself apart from others when it comes to financial support for its life science companies. The combination of the Emerging Technology Fund, RCICs, angel networks, and investments from venture capitalists have all joined forces to propel Texas forward as a life science leader. Article by Stephanie Patrick.

ON THE COVER: The Texas state Capitol Building. Photo by Patrick Motola. www.patrickmotola.com.

State of Texas

A message from the Governor

Rick Perry

The biotechnology and life sciences marketplace in Texas is vibrant and growing. The state's regulatory structure, low taxes and growing network of essential biotechnology development infrastructure provide an ideal climate for research, investment, and commercialization. Texas ranks in the top 10 nationally for the number of traditional biotechnology companies located in the state and is home to one of the nation's largest cancer research initiatives: The Cancer Prevention and Research Institute of Texas (CPRIT). CPRIT was issued $3 billion in general obligation bonds over ten years to fund grants for cancer research and prevention.

A majority of the top global biotech and pharmaceutical companies have locations in Texas, underscoring the state's diversity in these industries. In addition, venture capital investment in the state totaled $45 million in 2008. Texas is now home to over 1,000 biotech related facilities and institutions which span traditional biotechnology, biomedical research, business and government groups, medical manufacturing companies and world-class universities and research facilities. Today, Texas employs over 111,200 biotech workers within the biotechnology and life sciences industry with an average annual salary of over $69,500.

Expanding the biotech and life science industry is a top priority for Texas lawmakers. In 2001, the Texas Legislature appropriated $800 million for science, engineering, research, and commercialization activities, including $385 million for research infrastructure. A year later, we established the Council on Science and Biotechnology Development. The council was designed to create a partnership between institutions of higher learning, industry and government to promote biotechnology as an economic development tool.

When defining biotechnology areas more broadly, the Texas marketplace includes approximately 6,600 establishments. Texas' core biotechnology manufacturing establishments are in the Houston, Dallas-Fort Worth, Austin and San Antonio metropolitan areas.

Major biotech and life science employers in Texas include:

- Texas Medical Center;
- Kimberly Clark;
- Kinetic Concepts;
- Southwest Research Institute; and
- US Oncology.

Another visionary move came in 2005 when we announced the $200 million Texas Emerging Technology Fund (ETF) to promote and finance technological innovations in multiple industries, including biotechnology. The ETF was renewed in 2007 with appropriations of approximately $185 million. As of March 2009, the ETF has awarded more than $130 million for biotech-related projects.

Texas biotech and life science industry highlights:

- According to Business Facilities' 2008 Rankings Report, Texas ranked 4th in overall biotechnology strength and ninth in biotechnology venture capital investments with a total of $1.33 million in investments from 2002 through 2007.
- In 2007, one of approximately every 15 U.S. biotechnology employees worked in Texas. This figure is based on the expanded definition of biotechnology and the most current data available from the U.S. Bureau of Labor Statistics.
- In 2006, Texas ranked second in the number of life and physical scientists employed by the state, according to the latest data available from the National Science Foundation.

I urge you to discover the exciting developments in the Texas biosciences industry in the pages of Innovation Texas, the semi-annual publication of the Texas Healthcare and Bioscience Institute (THBI). Texas is committed to remaining a leader in the life science industry.

The choice is clear. Companies are choosing the Lone Star State due to our competitive business incentives, highly skilled work force, rich cultural heritage, and low cost of living.

Sincerely,

Rick Perry

Governor of Texas

Texas Healthcare and Bioscience Institute

A Message From the President

Thomas R. Kowalski

The Texas Healthcare and Bioscience Institute (THBI) was created in 1996 to help establish a viable and world-class environment for life science development in Texas. This issue of Innovation Texas focuses on elements that make our Texas initiative work. According to a recent study by New Economy Strategies, the following statistics point to a vibrant and productive cluster.

"The life sciences industry is composed of four primary niche sectors; Agriculture, Medical Devices, Pharmaceuticals, with Research & Testing being the largest.

The Life Sciences industry generates a significant economic impact on the state of Texas, as companies and institutions purchase equipment and inputs and well-paid employees spend money in their home communities. The industry's total economic impact on the State of Texas is estimated at $75 billion in economic activity and $31 billion in payroll. State and local governments receive an estimated $2 billion each year due to these impacts.

For every job created in the life sciences industry, another 2.3 jobs are created elsewhere in the Texas economy."

The vibrancy of the life science cluster is attributable to the collaboration between our state's world-class research institutions, our Texas-based life science industry, and the communities whose objective is to have the life sciences as a targeted industry.

It is an exciting time to be in Texas. The Texas Emerging Technology Fund and the newly created Cancer Prevention and Research Insitute of Texas are providing multiple research grants and awards, coupled with an emphasis on Tech Transfer and Commercialization, makes for an powerful mix of entrepreneurship and success.

I hope you will take the time to learn more about our great state and our life science sector. Please visit our website at www.thbi.com.

Sincerely,

Thomas R. Kowalski
President

Follow the Money Trail

By Stephanie Patrick

Less than a year ago, Curt Bilby and his company, Terapio Corp., were like many life science start-ups in this struggling economy. Terapio was operating on limited funds and working diligently to develop therapeutics for the treatment and prevention of adverse reactions to radiation.

"We had about $1 million in angel funds and we were looking for more to reduce our manufacturing risks," Bilby said. "We were several years before any product was commercially available."

That's when the Austin-based company received a shot in the arm, in the form of a $1.7 million investment from Texas Emerging Technology Fund. The fund, created by the Texas Legislature under the leadership of Gov. Rick Perry in 2005, has invested more than $139 million in more than 100 Texas companies and universities to date. More importantly, ETF's success has put the spotlight on a growing number of life sciences advancements in Texas. Despite the weakened national economy, some well-established venture capital investors are funding life sciences ventures in Texas and there are several new collaborations happening between the state's academic institutions and early stage companies.

"Life sciences are important in Texas," said Alan Kirchhoff, Director of ETF. "Out of all the money that the Emerging Technology Fund has invested in to date, about 45 to 47 percent of the companies are life science-related. It wasn't that way by design, we structured the fund to be a market-driven, merit-based model. We will invest in, and have invested in, any technology that meets a market-driven need. The company has to have a good management team around it, has to have a disruptive technology in a large market, be of the

Dr. Dennis Stone, Vice President for Technology Development at UT Southwestern

Jacqueline Northcut, President and CEO of BioHouston, Inc.

Curt Bilby, President and CEO of Terapio Corp.

quality to attract additional private capital and something that the consumers will want."

Created to provide Texas with a technological advantage by expediting the development and commercialization of new technologies, ETF applications are accepted on a quarterly basis and are reviewed by experts—including entrepreneurs and investors—from one of seven nonprofit regional centers of innovation and commercialization (RCICs) before being approved for the next round of further consideration.

Those companies deemed to have marketable potential are then sent to a 17-member board appointed by the Governor, the Lieutenant Governor and the Texas Speaker, where each company is asked to provide a 20-minute investor pitch. Then, after final analyses are completed, the approved proposals go on to the Governor, Lieutenant Governor and the Speaker, who must approve of the company's funding unanimously.

"It's a one-time award and the shot in the arm that early stage technology companies need to accelerate across that 'Valley of Death,' where the founders exhausted their own capital and that of family and friends, but often is not yet to a stage that other private capital will invest," Kirchhoff said. "It's when many early stage companies miss their market opportunity and can not survive.

"These early stage companies use our investment to accelerate their technologies to the point where they can attract additional capital. We are not a replacement for angel or venture capital; we are an accelerator for companies to get to the private capital."

The stakes are high, and more than 1,000 companies have applied for funding since ETF was established. Companies have been approved for anywhere from $250,000 to $3.5 million, as long as they continue to hit their milestones. Each also partners with a state academic institution and has ready access to industry experts for advice.

Even companies not approved for funding continue to get assistance from the RCICs, which have a growing roster of more than 500 volunteers who serve as mentors, coaches, and reviewers.

"It's pretty dynamic and a lot of the country is looking at what Texas is doing," Kirchhoff said. "We want our regions to develop grassroots innovation ecosystems that can grow their own technology companies with people who are working together to take a technology out of a university or out of someone's garage, wrap a management team around it, seed it with capital and accelerate it to the market."

"The Emerging Technology Fund is the catalyst to get that going."

ETF has shown measurable success, even a return on its investment. ETF's first funded company was CardioSpectra, a fiber-optic cardiac catheter company from San Antonio that received $1.35 million. About a year later, Volcano Corp., a California company formerly based in Texas, bought the company and doubled its number of employees to 50. It also kept the newly acquired division in Texas.

"On that deal, we ended up owning about 12 percent of the company and that investment paid the state back $2.1 million," Kirchhoff said. "That money went back into the fund, which was the idea. And, while the state's legislators can decide to take that money and put it back into general revenue, the concept is that it stays in the fund to be reinvested in other companies."

Susan Davenport of Austin Chamber of Commerce and BioAustin, said the fund's success has sparked even more activity in the already entrepreneur-rich Austin community. At last count, the Austin area had 107 life sciences companies with a total of about 6,700 employees.

She said angel networks and venture capitalist firms, such as Central Texas Angel Network, Santé Ventures and PTV Sciences, are taking keen interests in ETF-funded companies and other life sciences companies. The Chamber, through its efforts with the Central Texas RCIC, is heavily marketing the Austin area's life sciences companies to other venture capitalists nationwide.

"Medical device companies are certainly popular here, but we've also had a pharma company funded and other life sciences companies across the board funded," Davenport said. "There's just so much going on here and so many resources."

Longtime venture capitalist Thomas Harlan, President and CEO of Austin-based Emergent Technologies Inc. also welcomes Texas' efforts to embrace life sciences and is watching the ETF-funded companies closely. In fact, Abilene-based Receptor Logic, an Emergent-funded company, also received an ETF investment.

"This is the key to jobs and key to wealth creation in the state and I am grateful to Gov. Perry for having the moxie to push this in a depressed economy," Harlan said.

While for many years Emergent looked north and funded technologies out of the University of Oklahoma Health Sciences Center, it's now happily working in its home state, where Harlan has watched the life sciences industry mature and Texas' academic institutions take more active roles in the commercialization of their technologies. As of 2009, Emergent has launched 17 biotechnology,

Dr. Joe Cunningham, Managing Director of Santé Ventures.

Robert Gracy, Vice President for Research at UTSA.

Guy Diedrich, Vice Chancellor for Federal Relations and Commercialization at The Texas A&M University System.

biopharmaceutical and nanotechnology companies, including 11 in Texas. Emergent has distributed roughly half of its current $27 million fund, its fourth.

Harlan said his investors are looking for discoveries that can each reap at least $500 million per year in potential revenue and that means company founders and scientists should be prepared to consider multiple applications for their work, even those not health care related.

"We are not looking for the bio chip that is 20 percent better than the bio chip already on the market, but we are looking for the bio chip that's 300-400 percent better," he said. "We are looking for disruptive or breakthrough technologies that can be patented because we are very collaborative and we do co-developments with partners.

"We want to take the technology out of the university or its other source and put our brains around it to develop it or transform it into useable products and services with the help of a pharma or biotech partner that probably understands the space better than we do, the look and feel of the product better than we do, has been in the industry for decades and also has the infrastructure to get the product to the marketplace quickly."

In fact, Austin-based AeonClad Coatings LLC, which uses technology from the University of Texas at Arlington, anticipates its dry-coating innovation may be used for water pipelines in China and many other countries in the coming years. Meanwhile, its newly formed subsidiary, AeonClad Biomedical LLC, focuses on nanotechnology drug delivery and medical device coatings.

"At the end of the day, scientists love putting their technologies to work and solving problems," Harlan said. "We rarely end up commercializing what they bring to us."

He said the company expects to invest $5 million to $6 million in six or seven companies this year. It expects to have success with 60 to 70 percent of the companies.

To further support early stage ventures, Emergent also recently bestowed its first Opportunity Texas Proof-of-Concept award to researchers at the University of Texas at Dallas and the University of Texas Southwestern Medical Center at Dallas for their work on the StoneMag Kidney Stone Magnet Retrieval System, which locates and eradicates small pieces of a kidney stone that remain in the body after its been fragmented with sound waves.

Like the other discoveries Emergent supports, market potential was a top consideration when choosing the award winners. UTD and UT Southwestern researchers received $25,000 and another $25,000 in-kind technology commercialization services Emergent and its partners can provide. Meanwhile, UT Southwestern recently unveiled plans to build a biotech park to develop and make money off of medical discoveries. The BioCenter at Southwestern Medical District complex will be built on land purchased from the city of Dallas and will be located near the medical center's campus. Plans are to open the first building this year and have up to 500,000 square feet of laboratory, office and research space for companies interested in working with the medical center.

UT Southwestern discoveries already have led to companies such as Irving-based Reata Pharmaceuticals Inc., which develops cancer and neurodegenerative drugs, and Eliance Biotechnology, which was acquired several years ago by MacroGenics Inc., a Maryland-based company developing treatments tied to the immune system for cancer, infectious diseases and autoimmune disorders.

The site for BioCenter was purchased with profit UT Southwestern received from its technology transfer program, in which it sells the rights to further develop an idea first developed at UT Southwestern.

Dr. Dennis Stone, Vice President for Technology Development at UT Southwestern, said the BioCenter comes at a time when there's increased attention focused on medical devices, in large part because Dallas-based tech giant Texas Instruments has become interested in getting its components into medical devices. TI is partnering with UT Southwestern and other universities to advance projects to the company-formation stage. While funding is more difficult to come by and investors are demanding to see more advanced technologies before investing, Sevin Rosen Funds is among those looking at life sciences, he said.

"We are on a steady growth curve and there are cancer funds from the state that will help," Stone said. That's the state's new $3 billion Cancer Prevention and Research Institute of Texas, which will allocate research initiatives across the state.

The Austin-based institute is tasked with creating and expediting innovation related to cancer research and in enhancing the potential for a medical or scientific breakthrough in the prevention of cancer and cancer cures. In addition to developing and implementing an official Texas Cancer Plan, the institute will attract, create or expand research capabilities of public or private entities that will provide substantial increases in cancer research and in the creation of new jobs.

Jacqueline Northcut, President and CEO of BioHouston Inc., said the cancer funds are likely to bridge the widening gap where federal funding stops and private investment dollars start. BioHouston also is in talks with several pharmaceutical companies about working with earlier-stage companies.

"In the Houston region, we have almost tripled the number of product-development companies in the last five years," she said. "We have about 160 companies and about one-third are medical device companies and about one-third are drug-development companies."

Pharmaceutical giant AstraZeneca and the famed University of Texas M.D. Anderson Cancer Center in Houston recently renewed their collaboration to integrate preclinical and clinical research and to speed up access to new medicines of potential benefit to cancer patients. The collaboration calls for physicians and scientists in both organizations to combine resources and expertise in disease prevention, while providing flexibility to work in a variety ways to accelerate the development of new cancer treatments.

"I think we are going to see a steady, ongoing increase in life sciences companies in Texas and all of our various Texas institutes will play an important role in making sure that companies in their early stages get support," Northcut said.

Dr. Joe Cunningham, Managing Director of Santé Ventures, said the aging population and our unhealthy lifestyles make life sciences always strong for commercialization. There could be great advances in the treatment of various diseases in the coming decade.

"Texas is poised as well anywhere in the world to be a leader and to benefit in that revolution," Cunningham said. "We are now getting the management teams with experienced entrepreneurs in place and money is pretty efficient at following the opportunities.

"Remember that the biotech industry is very early in its lifecycle. You can't look anywhere around the world and find dozens of biotech success stories. But now is the time, and I think you will see Texas have the opportunity to become a leader in biotech."

He said Santé typically funds about one

percent of all the companies it sees and its current fund is expected to fund 15-20 companies. Seven have been funded.

"The most important thing about any company is its management team and having the right entrepreneur to lead the company," Cunningham said. "Sometimes the companies come to us with that and sometimes we work with the universities' medical schools to commercialize the technology (and) we will recruit in the management team."

The state also offers other advantages for early stage companies.

In College Station, Texas A&M Institute for Preclinical Studies is scheduled to open this summer. More commonly referred to as TIPS, the 112,000-square-foot center will focus on developing research activities and providing core services in the areas of device development, preclinical studies and biomedical imaging. In addition, TIPS will provide advanced training for students.

Temporarily operating out of Texas A&M University College of Veterinary Medicine and Life Sciences in College Station, TIPS will have the capability to house 240 large animals and a 25,000-square-foot core-imaging center, said Guy Diedrich, Vice Chancellor for Federal Relations and Commercialization at The Texas A&M University System.

"It will be the most state-of-the-art preclinical testing facility in the country," Diedrich said. "Of great importance is that it's married up to an outstanding, world-renowned vet school at Texas A&M, giving us the full breadth of specialties and expertise.

"There will be research, but we are also catering to small and large pharma throughout the state, the country, and ultimately, globally."

More than 30 companies, many of which are ETF alumni, are committed to doing their preclinical testing in the facility and there is about 10,000 square feet of incubator space for spinout companies. The Office of Technology Commercialization, which Diedrich runs, also will be housed there.

Also opening this summer in College Station, Texas A&M Institute for Genomic Medicine has the largest library of mouse embryonic stem cell clones and represents about 90 percent of all of the genes that have been knocked out in the mouse genome worldwide.

"The top 100-selling drugs in the world, representing more than $100 billion of market value, are based on 43 blocked functions of the human body," Diedrich said. "We are going to be studying 15,000 blocked functions at TIGM." In addition, the University of Texas at San Antonio has built an extensive commercialization program, which is designed to take innovations from the laboratory and into the marketplace by licensing them to existing companies or through startups. The program is made up of the South Texas Technology Management office, a regional technology transfer office, the Center for Innovation Technology and Entrepreneurship, the Institute for Economic Development, the Institute for Cyber Security, the San Antonio Technology Accelerator Initiative, and the Office for Contracts and Industrial Agreements. The South Texas Technology Management office oversees the intellectual property portfolios at UTSA, The University Texas Health Science at San Antonio, The University of Texas at Brownsville and The University of Texas-Pan Am. "We want to encourage our researchers and scientists to come forward with their ideas to seek commercialization," said Robert Gracy, Vice President for Research at UTSA. "Not all of them will work, but let's see what discoveries are out there."

ABILENE

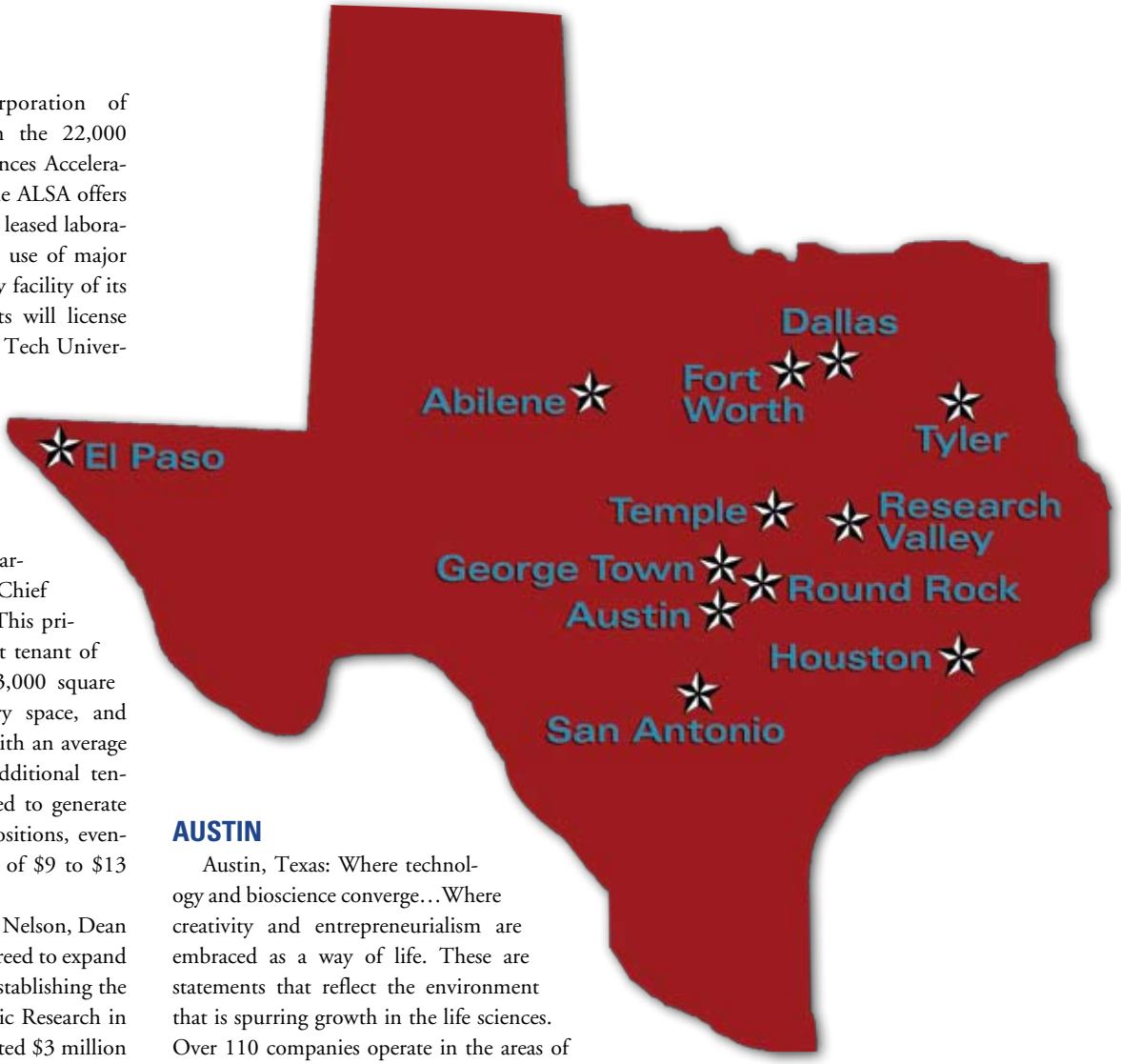
The Development Corporation of Abilene (DCOA) will open the 22,000 square foot Abilene Life Sciences Accelerator (ALSA) later this year. The ALSA offers early-stage biotech companies leased laboratory space and "time-shared" use of major research equipment—the only facility of its kind in West Texas. Tenants will license discoveries made at the Texas Tech University Health Sciences Center (TTUHSC) and other universities to develop products and treatments.

For example, Dr. Jon Weidanz, a faculty member at the TTUHSC School of Pharmacy in Abilene, is also the Chief Scientist of Receptor Logic. This private company will be the first tenant of the ALSA, occupying over 3,000 square feet of office and laboratory space, and will create 40 research jobs with an average annual salary of $70,000. Additional tenants of the ALSA are expected to generate 100 to 150 more research positions, eventually creating a total payroll of $9 to $13 million per year.

In December 2007 Arthur Nelson, Dean of the School of Pharmacy, agreed to expand the SOP research faculty by establishing the Center for Immunotherapeutic Research in Abilene. The DCOA committed $3 million for laboratory start-up funding and major capital equipment and TTUHSC SOP committed $4.5 million to provide salaries and operating overhead for 5 years. The Center Director is now recruiting faculty with a desire to take their discoveries from "bench to bedside" through commercialization.

Development of a workforce to meet the needs of biotech companies has involved all levels of education: last year the Abilene Independent School District opened a medical magnet high school on the campus of Hardin-Simmons University; this fall McMurry University began offering a B.S. in Biomedical Science for students interested in careers as researchers, health professionals, science educators, and support personnel; and Cisco Junior College recently was approved to offer a biotechnology technician associates degree. Growing the Abilene biotech sector is a community-wide objective.

For more information go to www.developabilene.com.



AUSTIN

Austin, Texas: Where technology and bioscience converge…Where creativity and entrepreneurialism are embraced as a way of life. These are statements that reflect the environment that is spurring growth in the life sciences. Over 110 companies operate in the areas of biotechnology, diagnostics, medical devices, pharma, CROs, etc.

A strong university presence (38 colleges and universities within a 100-mile radius) offers diversity in life science/healthcare related curricula, training and research. The University of Texas (UT) College of Pharmacy is one of the premier institutions of pharmaceutical education and research in the country. Additionally, the UT System Board of Regents is considering placing a branch campus of the UT Southwestern Medical Center in Austin.

Meanwhile, the Texas A&M Health Science Center (under construction) will house third and fourth-year medical training programs. The master plan calls for a campus with approximately 20 buildings and ultimately a four-year medical program. Texas State University is also under construction on a new $35 million nursing education facility in Round Rock and Concordia announced plans for their new nursing program starting in 2010. The University Medical Center (UMC) at Brackenridge houses the Clinical Education Center that utilizes high-fidelity interactive mannequins to train clinicians.

Research has a stronghold in the Austin region. UT alone has over 3,500 research projects, 100 organized research units and annual research funding exceeding $497 million. The Dell Pediatric Research Institute (adjacent to the Dell Children's Medical Center) provides opportunities for collaboration with researchers and companies.

UMC at Brackenridge houses the nationally renowned Brain & Spine Center that is engaged in pioneering research and treatment of injuries and diseases of the spine, brain, and cardiovascular system, and the UTMD Anderson Cancer Center completed a $30 million expansion on its 381-acre Bastrop campus. The Virginia Harris Cockrell Cancer Research Center, a unique component of the UTMD Anderson Cancer Center, is recognized as a world leader in research on carcinogenesis and cancer prevention.

The UT Office of Technology Commercialization works closely with university inventors and a network of resources to form new ventures that serve the public interest by finding practical applications for university-developed technologies.

In 2008, nearly 2,400 patents were assigned to inventors in Austin. Venture funds like PTV Sciences ($190 million fund) and Santé Ventures ($130 million fund) along with other VCs and the Central Texas Angel Network provide the backbone spurring new company development. In the last three years nearly $1.7 billion was invested by VCs in Austin companies (all technologies).

Continued collaboration between companies is facilitated through BioAustin, which provides the foundation for networking within the life sciences community in the Central Texas region.

For more information call (512) 322-5608, or check out www.bioaustin.com.

DALLAS/FORT WORTH

The Dallas/Fort Worth (DFW) region is proud of its growing life science industry. Ranked as the fourth largest metropolitan area in the nation, the region has a fast-growing population and solid economy providing a strong foundation for the life science industry. In 2007, the number of DFW life science firms was over 470, including established pharmaceutical, medical device and early development stage companies.

The area boasts over 40 colleges, universities and research facilities offering programs in life science disciplines. High quality academic institutions such as Baylor Research Institute, Texas A&M Health Science Center – Baylor College of Dentistry, The University of North Texas Health Science Center, The University of Texas at Dallas and The University of Texas Southwestern Medical Center are generating new discoveries, inventions and patents in the life sciences. Some of the established anchor companies include Alcon Laboratories and Texas Instruments. Other companies including ACS, Perot Systems, AT&T, Verizon, and EDS provide technology and service offerings that meet the critical needs of the healthcare market. Furthermore, entrepreneurial spirit and business development assistance providers have supported the growth of early stage companies like Gradalis, Reata Pharmaceutical and Tissuegen. North Texas is also playing a key role in the IMS revolution, the convergence of the fields of biotechnology, medical devices, high-tech electronics, IT and telecommunications to create "smart" medical devices.

The industry is served by organizations such as the Dallas Regional Chamber's Technology Business Council and BioDFW that actively collaborate to foster the growth of the area's market and research activities. The Dallas Regional Chamber's Technology Business Council plays an active role in promoting public policy positions, bringing together industry leaders, and spurring economic development. In addition, BioDFW represents a working alliance of industry, government, education and supporting organizations that promote the life sciences industry.

To learn more, visit www.DallasTBC.org or www.BioDFW.org.

EL PASO

El Paso, America's 21st largest city, lies at the heart of a bi-national metropolitan area of 2.6 million. With over 240,000 persons engaged in manufacturing, the El Paso/Juarez "borderplex" is one of the largest manufacturing centers in North America. Approximately 40,000 of this bi-national workforce is engaged in medical device production, supported by a robust capability of contract sterilization (ETO and irradiation), sterilization verification, a biocompatibility lab, plastic injection molding, metal stamping, as well as the capability to support medical research and clinical trials in both private and higher education institutions.

The medical school will maintain four Centers of Excellence largely focused on these applications and we anticipate opportunities for companies to jointly develop devices, diagnostics, test protocols, and more.

El Paso is also home to the Texas Tech University Paul L. Foster School of Medicine—America's newest four-year, research-focused medical school, and the first and only medical school currently located on the US border with Mexico. Due to El Paso's 82.1 percent Hispanic demographic, unique geographic location, and the presence of Ft. Bliss (which will grow to almost 40,000 active duty personnel by 2012)—the region provides distinctive advantages for health research for Hispanic, border, and military applications. The medical school will maintain four Centers of Excellence largely focused on these applications and we anticipate opportunities for companies to jointly develop devices, diagnostics, test protocols, and more.

Two major research universities reside in the region (UTEP and NMSU), which annually produce more than 1,100 scientists and engineers. Other assets include a network of five major private hospitals, a county hospital co-located with the medical school, and the William Beaumont Army Medical Center (WBAMC) at Fort Bliss.

To ensure continued momentum in the development of life sciences in our area, the El Paso Regional Economic Development Corporation (REDCo) has engaged Fluor Global Location Strategies to conduct a Biosciences feasibility study. Scheduled for completion in February 2009, the study already indicates a significant concentration of regional medical device production in the fields of cardiovascular care and general/cosmetic surgery.

To learn more about establishing a presence in the El Paso region, contact Samantha Chagra, Director of Business Development for Life Sciences at REDCo, (915) 534-0557.

GEORGETOWN

In November 2008, K. Russell Peterman, Executive Director of Texas Life-Sciences Collaboration Centre (TLCC), accepted the Williamson County Growth Summit's Economic Impact Award for 2008.

The mission of TLCC is to enhance educational opportunities in the life sciences and to create jobs and regional economic growth by assisting the transition of biotechnology, life-sciences, and nanotechnology companies from incubator stage through the commercialization stage.

TLCC's values are:

- Provide ethical leadership and financially-responsible economic investments for Georgetown and the region;
- Promote educational opportunities and collaborations;
- Focus on innovation-based systemic economic growth; and

- Encourage contributions toward the well being of humanity.

TLCC's Strategic Principles are to:

- Build an innovation-based economic development organization for Georgetown and provide life-sciences based collaborations for the region;
- Focus on organizational execution, educational opportunities, and financial discipline;
- Drive economic growth and education as a processes within the organization; and
- Spread good ideas across great people and the local and regional infrastructure that share TLCC's goals and values.

TLCC was founded through a collaboration with The City of Georgetown, The Georgetown Chamber of Commerce, and Southwestern University. TLCC's member companies include:

- Quantum Logic Devices;
- Orthopeutics;
- Radix BioSolutions;
- Deaton Engineering; and
- Turnco Tool & Instrument.

In 2009, TLCC is adding shared-use wet lab space, CLASS 10,000 Clean Room, and complete biotech and nanotech equipment via a federal grant.

For more information go to www.texaslifesciences.com.

HOUSTON

Houston boasts the largest concentration of research and healthcare institutions in the world with more than $1.8 billion in annual research spending at regional academic and research institutions. In addition, the number of life science product development companies in the region, including those focused on therapeutics, medical devices and diagnostic products, has more than doubled to over 150 since 2004.

With the goal of stimulating innovation and creating economic wealth for the region, BioHouston, Inc. has helped create an environment that stimulates technology transfer and life science commercialization by hosting nearly 5,000 people at more than 65 BioHouston events annually.

As a result of this unique combination of resources and progress, the true potential of the region as a leader in the commercialization of life science is beginning to be recognized nationally. Our companies include leaders in innovative science and technology, Cyberonics and Lexicon Pharmaceuticals, and a number of start-ups exploring a wide range of innovative commercial products. These start-ups include Thrombovision, OrthoAccel Technologies, and Visualase, which are the first three winners of the Michael E. DeBakey Life Science Award, established by BioHouston in 2006 to honor the pioneering cardiac surgeon.

With the goal of stimulating innovation and creating economic wealth for the region, BioHouston, Inc. has helped create an environment that stimulates technology transfer and life science commercialization by hosting nearly 5,000 people at more than 65 BioHouston events annually. In association with the Texas Healthcare and Bioscience Institute, our annual Texas Life Science Conference has quickly grown to become the largest life science venture capital conference in the southwestern United States. This conference showcases leading Texas life science companies, technologies, and emerging scientific developments to an audience of preeminent venture capitalist and angel investors, industry executives, entrepreneurs, and leading researchers. More than 550 attendees heard 70 presenting companies and participated in close to 100 one on one meetings during the 2008 conference. The 2009 conference will be held on November 11-13, 2009.

Please visit our website at www.biohouston.org to learn more about this conference, the exciting life science community in the Houston region and BioHouston's leadership in the growth of our industry.

RESEARCH VALLEY

Located at the heart of the Texas Bio-Triangle, The Research Valley is a region that surrounds the prospering mid-sized metros of Bryan and College Station, an emergent hotbed for the biotechnology and life sciences industry.

Business conditions in The Research Valley are ripe with opportunity and underpinned by world-renowned research expertise and the first-in-class industry infrastructure of the Texas A&M University System, one of the premiere systems of higher education in the nation. The Research Valley is a unique Texas treasure—a leading source to industry for highly skilled biotech and life science professionals and a comfortable, family-centric setting where academia, communities and health care institutions come together to help advance the biosciences industry.

Growing industry awareness on the disruptive value of the A&M System has biotech investigators, entrepreneurs and venture investors voyaging to Bryan and College Station to secure strategic alliances and technology rights which can strengthen market performance potential. In ways large and small, The Research Valley is flexible in responding to industry priorities and highly innovative nature of biotech companies.

Supporting the region's expanding life science and biotechnology cluster is BioResearch Valley, a consortium of public-private service institutions. In addition to networking the abundant resources to commercialize industry discoveries within Bryan and College Station, BioResearch Valley compliments the Research Valley Innovation Center, a science and technology business incubator/accelerator teamed with the Texas A&M University System and connected to the Texas Emerging Technology Fund.

From agriculture to veterinary medicine and life sciences, The Research Valley is dedicated to providing a well-synchronized hub of game-changing facilities and partnerships that enable bioscience innovation. Upcoming initiatives that will enhance The Research Valley's portfolio of facilities and further showcase the region's dynamic biotech scene include:

- Master Plan for BioResearch Valley with consortia roadmaps in the industry sectors of bioproducts/energy, medical devices, pharmaceuticals and healthcare.
- Industry alliances with the Texas A&M University System to establish a flexible, integrated biopharmaceutical enterprise with manufacturing capacity aimed at enabling rapid translation of new therapeutics and devices from the bench to the bedside.
- 200,000+ square feet Texas A&M University "Emerging Technologies

Building" to assist corporate collaborations and capitalize on the University's revered biomedical engineering strengths.

The Research Valley offers a thriving, world-class innovation arena to support the Texas and global bio-economies.

For more information, go to www.bioresearchvalley.org.

ROUND ROCK

Round Rock, Texas is an emerging player on the bioscience landscape, with three regional hospitals, a Texas A&M medical school under construction, a Texas State University nursing school under construction, and a base of existing bioscience companies in the area.

Did we mention the University of Texas at Austin and the ATI Bioscience incubator are just 15 miles down the road? Bio companies already doing business in the Round Rock area include Cerilliant, Micro-Bac, Hospira and Exfluor Research.

In addition to the higher education institutions already mentioned, Austin Community College just broke ground on its 274,000-square-foot campus in Round Rock and will offer health science and applied technology programs when it opens in 2010. ACC is well known in Central Texas for providing "on demand" workforce education programs to meet the needs of emerging industries.

Texas A&M, Texas State and ACC are already collaborating on health science education programs, particularly in the field of nursing. Texas State, in fact, will be moving its College of Health Professions to its Round Rock campus because of the synergy that has already been created in Round Rock's Educational-Medical corridor.

With a population of 94,840, Round Rock's combined property tax and utility rates are the lowest in the region. It has an award-winning park system, nationally recognized school district and is the 19th safest city in the United States. The City's ability to help developers deliver projects on time is renown, whether it be the opening of the 450,000-square-foot Premium Outlets in time for a sales tax holiday weekend, or Toppan Photomask's clean room manufacturing facility in a record-setting 11 months.

Learn more the great business climate in Round Rock at roundrocktex.com.

SAN ANTONIO

Healthcare and bioscience constitute a leading engine of the San Antonio economy, employing 1 of every 7 members of the workforce, with a 2007 economic impact of $16.3 billion. Organizing and promoting the sector is the role of BioMed SA, a non-profit, public/private collaborative formed four years ago to promote the nation's seventh largest city as a "City of Science and Health".

San Antonio is also becoming the home of military medicine as a result of the Base Realignment and Closure process. Its two Department of Defense hospitals, Brooke Army Medical Center and Wilford Hall Medical Center, are being consolidated into the San Antonio Military Medical Center (SAMMC). In addition, medics for all service branches will be trained in San Antonio under the new Military Education and Training Command. Altogether, more than $2 billion in military medical construction will take place by 2011.

Academic medicine is another major industry catalyst, led by the University of Texas Health Science Center at San Antonio, which eclipsed $200 million in external research, grants and awards in 2008. The university saw a 28 percent jump in funding from the National Institutes for Health, and spending on sponsored programs increased 22 percent. Meanwhile, the University of Texas at San Antonio continues its quest to become a premier research university, with bioscience awards of almost $20 million in 2008.

San Antonio's civilian healthcare and bioscience sector is also expanding at a rapid pace. Construction began on 2.7 million square feet of hospitals, medical offices and related facilities during 2007, representing over $1 billion in investment, with much of it coming to fruition in 2008-2009. Local biomedical leader, KCI, diversified its overall product line in 2008 by acquiring New Jersey tissue repair firm, LifeCell, for $1.7 billion. Genzyme Corporation, DPT Laboratories, and Mission Pharmacal are also expanding and earning national recognition. Meanwhile, emerging bioscience firms are multiplying with startups like Evestra, Inc., a Southwest Foundation for Biomedical Research spinoff, and Vidacare, whose EZ-I0 device won top honors in the Wall Street Journal's technology innovation competition.

TEMPLE

Temple, Texas, located an hour north of Austin on I-35, is home to state-of-the-art healthcare facilities, advanced health education and cutting edge biomedical and agricultural research. Scott & White, one of the nation's largest fully integrated healthcare systems and the Central Texas VA System, the nation's 4th largest VA consortium are the primary teaching facilities hosting a full 4-year medical school campus of the Texas A&M Health Science Center. Complementary Temple facilities include The Texas A&M University/USDA Blackland Research Center and The Texas Bioscience Institute, a national-award-winning facility that links top notch science education to biotechnology workforce development. By combining the human health and agri-bioscience components, these partnerships have become a catalyst for biotechnology development in Central Texas.

Institutes and Centers of Excellence include the Cardiovascular Research Institute, a cooperative venture between some 70 world class molecular biologists and 40 cardiovascular physicians, the Cancer Research Institute, focusing on development and testing of new anti-cancer drugs and recipient of a $7.5 M award from the Texas Enterprise Fund, the Regenerative Medicine Research Institute, led by an internationally prominent scientist and recipient of a Research Superiority Award through the Texas Emerging Technology Fund and the VA Neuroscience Center of Excellence; one of only three federally funded centers for studying PTSD and traumatic brain injury. Together these entities represent a virtual comprehensive contract research organization, including regulatory infrastructure to accelerate identification of active compounds, process development and GMP production, pharmacology/toxicology testing, IND applications and coordination of multi-institutional clinical trials.

The Temple Health & Bioscience Economic Development District, created by the Texas Legislature in 2003 and to date the only such entity in the State, has focused its' efforts on partnering with and facilitating all of the above efforts on the part of our academic partners. Through acquisition of a 500,000 square foot facility located on a 500 acre tract (Temple BioPark), the District was able to accommodate a number of

the remarkable resources described above. Currently the District is engaged in developing a bioincubator to support entrepreneurial investigators and bioscience start-up companies. Two hundred acres of the BioPark are being developed as "shovel ready" building sites for new and relocating biotechnology companies.

TYLER

Breakthrough biomedical research conducted by scientists at The University of Texas Health Science Center at Tyler seeks to improve the health and quality of life for people around the world.

UTHSCT researchers are exploring how to reverse the effects of aging on one part of the immune system—thus helping older adults stay healthy longer—and developing chemicals that seek out and kill cancer cells.

Dongming Su, Ph.D., an assistant professor of biochemistry at UTHSCT, is examining the genetics behind the production of T cells in the thymus gland. T cells are the immune system's gatekeepers: they identify bacteria, viruses, and cancerous cells and direct the attack on these disease-causing organisms.

As you age, fewer varieties of T cells are produced, allowing some disease-causing cells to elude your body's defenses.

Dr. Su is investigating how to keep the thymus producing the many varieties of T cells needed to protect against infection. His research could lead to therapies that improve the health of older people and help remedy the effects of autoimmune diseases.

Another researcher, Rakesh Srivastava, Ph.D., a professor of biochemistry, and his wife, assistant professor Sharmila Shankar, Ph.D., are developing therapies that target and kill only cancer cells. They are exploring how specially designed molecules bind to "death receptors" on the surface of cancer cells and force them to die, leaving normal cells unaffected.

In 2008, UTHSCT research awards totaled more than $12 million, and current NIH funding is almost seven times greater than it was just a decade ago.

Drs. Su, Srivastava, and Shankar are three of the 33 biomedical researchers at UTHSCT, most of whom are externally funded by the National Institutes of Health and other organizations. In 2008, UTHSCT research awards totaled more than $12 million, and current NIH funding is almost seven times greater than it was just a decade ago.

For more information, visit the UTHSCT Website at www.uthct.edu.

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The Vertical Expandable Prosthetic Titanium Rib was developed by pediatric surgeons with The University of Texas Health Science Center at San Antonio and CHRISTUS Santa Rosa Children's Hospital to treat children with thoracic insufficiency syndrome.

BioMed SA is a non-profit, membership-based organization, supported in part by Bexar County and the City of San Antonio