



BIO MATTERS

G R E A T E R
O K L A H O M A C I T Y
C H A M B E R

**A GREATER OKLAHOMA CITY
BIOSCIENCE STRATEGY UPDATE**



“Your work saved my life,” she told them as she hugged their necks. “I’m here and still alive and kicking, thanks to you!”

- Bonnie J. Carson, Sepsis Survivor

BIO MATTERS

Bioscience matters to each of us. It impacts our health, food, transportation, crops and sources of energy. Our lives are likely touched by bio every day in ways we don’t even realize. A strong bioscience region means a strong Oklahoma. And a strong Oklahoma means a healthier, wealthier and happier life for us all.

No doubt, Oklahoma’s bioscience sector is a key driver in the growth of our economy. And central Oklahoma’s bio-corridor, stretching from Ardmore through Norman, Oklahoma City and to Stillwater, is where amazing things are happening.

New drugs. New crops. New sources of energy. New companies. Our investment in medical research, education, plant and life sciences and start-up companies is definitely paying off. Bio is more than scientists and researchers. It is more than energy, health care, research and education. The bioscience sector is making a difference in our lives and our economy in basic ways we can all understand.

Many of us have friends or relatives with illnesses like cancer, lupus or diabetes. Right now, right here in Oklahoma, research and clinical trials are underway to find cures. Thanks to bio, we are also helping farmers in Oklahoma create better food stocks and the next generation of sustainable crops.

In the industry sector, biotechnology is helping us reduce greenhouse gases and develop new ways to conserve energy. And for some trailblazing entrepreneurs, the dream of starting and growing a company is becoming a reality, thanks to bio.

Oklahoma has come a long way since 2005, when the Battelle Technology Partnership Practice last analyzed Oklahoma’s bioscience sector and helped the Greater Oklahoma City Chamber and their partners develop a bioscience roadmap. Now, five years later, we can see definite progress in our journey. We can also see crucial areas that we must address to accelerate bio’s growth in the future.

HEALTHIER, WEALTHIER, HAPPIER LIVES

THE BIOSCIENCES ARE BEST UNDERSTOOD WHEN WE CAN DISCOVER HOW INDIVIDUAL LIVES ARE IMPACTED BY NEW MEDICAL DISCOVERIES, AGRICULTURAL RESEARCH AND BUSINESS SUCCESS.



SURVIVING SEPSIS

When Bonnie J. Carson awoke on a hot July Saturday morning, just a day after receiving a breast biopsy, she was concerned by some redness around her surgical bandage. After a call to the radiologist, she was assured it was nothing to worry about and told to check back in on Monday, if necessary.

By the time Monday arrived, Bonnie was fading in and out of consciousness, barely alive. When her daughter called at 7 a.m., Bonnie didn't stay conscious long enough to finish the conversation. After being transported to Mercy Hospital, her diagnosis was dire. With a 106-degree temperature, severe sepsis and only a 20 percent chance of survival, she was teetering in a two-hour window that would decide if she lived or died.

Her near-death experience created an unexpected bond between Bonnie and researchers at Oklahoma Medical Research Foundation. A "super blood thinner and clot buster," in Bonnie's words, was discovered at OMRF. And Xigris (the commercial name for the drug) saved Bonnie's life.

For the 20 percent of people who survive sepsis, recovery typically takes about 4 weeks. Bonnie recovered in four short days thanks to OMRF's medical breakthrough.

"I have a new appreciation for the work that goes on at OMRF," Bonnie said. "The people of Oklahoma need to support OMRF's research because you never know when you might be on

death's door and need one of the new medications they have discovered."

It wasn't until about a year ago that Bonnie got to meet her lifesaving heroes Dr. Charles Esmon and Dr. Fletcher Taylor at the groundbreaking for OMRF's new tower.

"Your work saved my life," she told them as she hugged their necks. "I'm here and still alive and kicking, thanks to you!"

Charles Esmon, an OMRF scientist, received the American Heart Association's 2010 Basic Research Prize for his contributions to understanding the human blood clotting system. His work led to the creation of Xigris, for the treatment of severe sepsis, and Ceprotin, a therapeutic for patients suffering from a life-threatening protein deficiency.

The National Institutes of Health selected OMRF as one of only nine Autoimmunity Centers of Excellence in 2009. OMRF joined Yale University, Stanford University, Duke University and five other institutions pursuing projects to develop treatments for conditions like lupus, multiple sclerosis, rheumatoid arthritis and type 1 diabetes.

"Bioscience research is a powerful engine that helps to drive our state's economy. At the Oklahoma Medical Research Foundation, our scientists' work has yielded more than 600 domestic and international patents. Each patented discovery represents a potential breakthrough in the fight against human disease—and a potential new business venture. Indeed, OMRF has spun off more than a dozen biotech companies. Those businesses, in turn, fuel widespread private-sector growth, creating high-quality, high-paying jobs right here in Oklahoma."

Stephen Prescott, MD
President, Oklahoma Medical
Research Foundation



The Presbyterian Health Foundation Research Park has expanded to comprise seven buildings and 700,000 square feet on its 27-acre complex, and now more than 35 science-based companies.

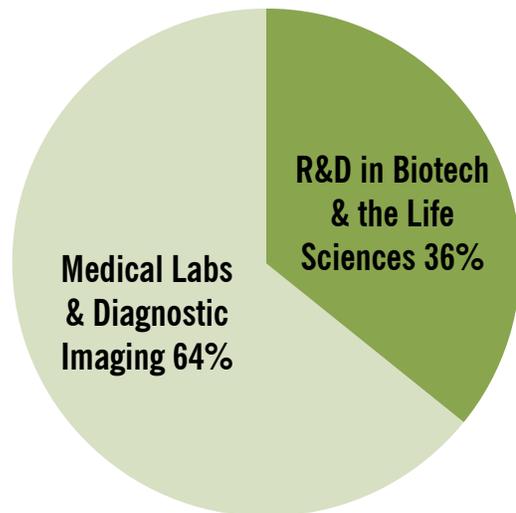


Medical labs, diagnostic imaging centers, medical devices and biotech research and development have experienced the largest growth in employment.

BIO IS GROWING IN OKC

The Greater Oklahoma City region's bioscience companies, foundations and research organizations have grown their employment base in recent years. They have also grown in their importance to our regional economy. Workers in our bio sector earned an average of \$45,439 in 2008. Medical labs, diagnostic imaging centers, medical devices and biotech research and development have experienced the largest growth in employment.

Greater OKC Research, Testing, & Medical Labs Employment

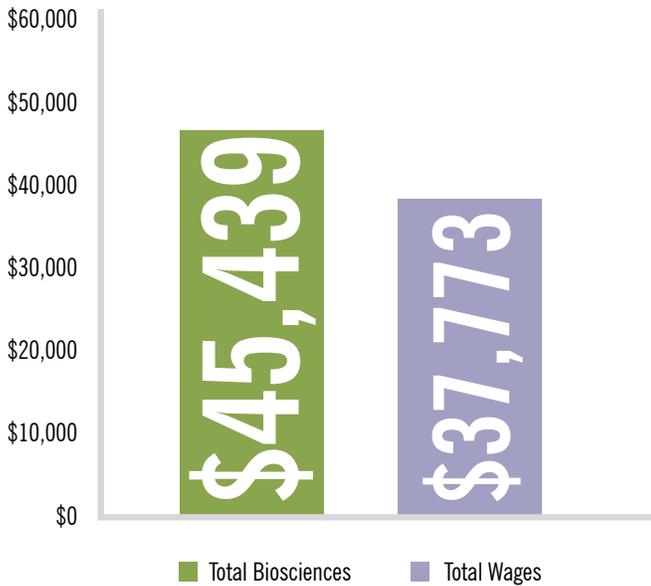


BIO INDUSTRY EMPLOYEES EARN MORE THAN \$7,700 ABOVE THE AVERAGE WAGE

The average yearly wage in Greater Oklahoma City is \$37,773, while the average for an employee of a bioscience company is \$45,439. The following is a list of the average yearly wage for several job categories. **Bolded text** indicates a bio industry sector.

Drugs and Pharmaceuticals	\$58,343
Research, Testing and Medical Labs	\$51,050
Professional, Scientific and Tech. Services.....	\$50,652
Biosciences (non-hospital)	\$49,979
Finance and Insurance	\$47,640
Information.....	\$45,956
Medical Devices and Equipment	\$45,839
Agricultural Feedstock and Chemicals	\$44,796
Hospitals	\$44,739
Transportation and Warehousing.....	\$39,630
Construction	\$38,906
Agriculture, Forestry, Fishing and Hunting	\$28,240
Retail Trade.....	\$24,320
Arts, Entertainment and Recreation	\$20,892

AVERAGE WAGES



GREATER OKLAHOMA CITY HAS A GROWING BIOSCIENCE INDUSTRY BASE

Stakeholders in the Greater Oklahoma City region have consistently worked to strengthen our bio economy in recent years, and some of the results of this effort can be seen at the PHF Research Park.

Presbyterian Research Park

- More than 35 bioscience companies
- Seven buildings, with 700,000 square feet of wet lab space
- Recent company growth includes:
 - Cytovance Biologics employs 50 people
 - Charlesson LLC was named one of Oklahoma City's fastest growing companies
 - Selexys Pharmaceuticals moved into clinical trials for two drugs in 2010



KNOWING OUR RESEARCH STRENGTHS

Critical mass occurs when a group of talented people and unique resources, facilities and activities converge to create momentum. Right now in Oklahoma's biosciences sector, critical mass is happening in several areas. Based on our current strengths and market potential, there are five biomedical and four bioagricultural areas that offer the best opportunities in our region for creating jobs and growing our economy.

Biomedical

- Autoimmune Diseases and Immunology
- Cardiovascular Research
- Glycobiology and Carbohydrates
- Infectious Diseases and Microbiology
- Vision Research and Ophthalmic Neuroscience

Bioagricultural

- Plant Improvement
- Biofuels and Biorefinery Products
- Natural Products for Health
- Value-Added Food Products

Oklahoma Medical Research Foundation's new 186,000 square-foot research facility houses 34 labs and is partially powered by 24 wind turbines on the roof.





GREATER OKLAHOMA CITY HAS A GROWING BIOSCIENCE R&D BASE

In addition to the growth of the PHF Research Park, Greater Oklahoma City has also seen an increase in our bio research & development activity.

Researchers

- The region's R&D base has grown by 25 percent since 2004
- In 2009, bioscience R&D was approximately \$300 million, including:
 - The Noble Foundation - \$54 million
 - Oklahoma Medical Research Foundation - \$60 million

New R&D faculty over the past four years

- OU Health Sciences Center – 44
- Oklahoma Medical Research Foundation – 15
- Noble Foundation – 7

Capital investments since 2005

- OU Cancer Institute
 - New \$100 million, 210,000 square foot building
 - The state's only Cancer Phase I clinical trials center
 - Latest generation of proton radiation therapy
- OU's Stephenson Life Sciences Research Center
 - New teaching and research lab space
- OMRF's Research Tower
 - Doubles current scientific and administrative space
 - Expansion from 50 to 80 researchers
 - Total workforce expansion from 500 to 800 employees
- Dean McGee Eye Institute
 - New 78,000 square foot building
- OSU's Henry Bellmon Research Center
 - Opened in 2010
 - \$70 million investment
 - Interdisciplinary research space in collaborative environment
- OSU's Agricultural Experiment Station
 - Under construction adjacent to the Noble Foundation
- Harold Hamm University of Oklahoma Diabetes Center
 - \$20 million new investment

The new \$100 million, 210,000 square-foot OU Cancer Institute houses the state's only Cancer Phase I clinical trials center.

The Oklahoma Bioscience Association (OKBio) was launched in 2008, establishing a strong, networked and collaborative bioscience community to promote industry growth and provide a strong voice.

GREATER OKLAHOMA CITY HAS INCREASED THE AVAILABILITY OF EARLY-STAGE CAPITAL FOR BIOSCIENCE COMPANIES

In just the past few years, opportunities to fund home-grown biotech operations in our region have increased through the help and assistance of the following entities and programs.

Oklahoma Center for the Advancement of Science and Technology (OCAST)

- Funded through state appropriations
- OCAST runs a variety of programs to assist in science and tech-based research (basic and applied)
- Funded 60 projects totaling \$17.6 million in 2010
- Strong return on investment of projects
- 3,140 jobs created or retained by OCAST-supported organizations in 2010

Innovation to Enterprise (i2E)

- Founded in response to an OCAST initiative
- Non-profit corporation focused on growing technology-based companies in Oklahoma
- Works directly with entrepreneurs, researchers and companies to assist with technology commercialization and access to capital
- i2E's clients display higher job, revenue and capital growth than the state average
- i2E's non-profit assistance model has become internationally known and a benchmark for other states and regions

Oklahoma Seed Capital Fund

- Launched in 2007 with over \$7 million
- Start-up and early-stage equity for small, tech based companies in Oklahoma
- Investment range of \$250,000 to \$700,000
- Invested \$3.4 million in its first financing round
- Matched by \$8.7 million in angel investments

Seedstep Angels

- Formed and managed by i2E
- i2E provides business plan reviews, deal flow and assistance with due diligence

Oklahoma Life Science Fund II

- \$10.5 million fund
- Investments in Altheus Therapeutics, Lifetone Technology Inc and Selexys Pharmaceuticals

Economic Development Generating Excellence (EDGE) Fund

- Provides funding to support research and development companies' commercialization
- Funded a glycomanufacturing facility
- Funded a developer of drugs to treat macular degeneration and eye disease
- Funded a developer of novel therapeutics for Chron's disease
- Funded five bioscience companies out of 12 applicants in 2010

GREATER OKLAHOMA CITY'S TECHNOLOGY TRANSFER OPERATIONS HAVE BEEN REVAMPED AT OU AND OSU TO ENCOURAGE COMMERCIALIZATION OF RESEARCH

Previously small or non-existent programs at our state's two major universities have been redeveloped into fully-formed, well-staffed and highly effective technology transfer operations.

The University of Oklahoma's Strategic Planning and Economic Development department administers the OU Center for the Creation of Economic Wealth, the Corporate Engagement Office and the Office of Technology Development. The CCEW trains, mentors and encourages entrepreneurs; the CEO facilitates interaction among academia, government, military, and private sector interests, helping to build relationships and identify opportunities of common interest; and the OTD works with OU researchers to protect intellectual property and to find the best path for that technology to the marketplace. These three areas work in concert to encourage entrepreneurship and research commercialization and wealth creation.



In 2008 alone, 4,673 bioscience degrees were awarded in this region. Other cities like Birmingham, Kansas City, Louisville and Tucson trailed by comparison.

Similarly, Oklahoma State's Research and Technology Transfer office manages the Office of Intellectual Property Management, which fosters the creation of innovative technologies and manages those technologies and other intellectual property for the benefit of the University and the public; and provides support for Oklahoma EPSCoR - the Oklahoma Experimental Program to Stimulate Competitive Research - whose central goal is to increase the state's research competitiveness through strategic support of research instruments and facilities, research collaborations, and integrated education and research programs.

GREATER OKLAHOMA CITY IS ENCOURAGING STUDENT ENTREPRENEURSHIP

Where entrepreneurship training and support was formerly absent, Greater OKC now boasts enviable opportunities for interested prospective entrepreneurs. For example, students at OU's Price College of Business Center for Entrepreneurship can complete Bachelor's and Master's degree programs in Entrepreneurship and Venture Management, as well as study abroad and Entrepreneurship Minor programs. OU's Entrepreneurship program was ranked by Entrepreneur magazine, in association with The Princeton Review, as 11th in the nation. U.S. News & World Report ranked the program 17th.

OSU's Department of Entrepreneurship offers an undergraduate major and minor, an MBA concentration and a PhD program; and The Riata Center includes a dedicated staff of entrepreneurship professionals who foster the spirit of entrepreneurship through innovative outreach programs. The Center is intimately engaged with the entrepreneurial community, and strongly committed to creating unique experiential learning opportunities for students.

In addition to these, two other notable programs exist for student entrepreneurs to encourage and foster success in the marketplace:

Donald W. Reynolds Governor's Cup Business Plan Competition

- Created in 2004 as an opportunity for students to apply what they learn in the classroom to a realistic setting

- Students learn to work as a team, develop research skills, gain insight into financial reporting and test their presentation skills in order to compete for awards
- 650 students compete annually
- 136 innovative ideas were presented in 2010
- More than \$860,000 in cash and prizes have been awarded

i2E Fellows

- The i2E Fellows program was created by the Greater Oklahoma City Chamber and i2E
- Ten-week paid fellowships are awarded to select advanced undergraduate and graduate MBA-level candidates
- Winners work with real-life, start-up companies needing their skills on pre-defined projects

A STATEWIDE ASSOCIATION HAS BEEN FORMED TO PROMOTE BIO GROWTH AND PROVIDE A BIO VOICE

The Oklahoma Bioscience Association (OKBio) was launched in 2008, establishing a strong, networked and collaborative bioscience community.

- Members include bioscience companies, research institutions, economic development organizations and educators
- Hosts workshops and networking events
- Supports the Bioscience Roundtable, a monthly meeting for bio CEOs
- Bio CEOs identify common issues, formulate solutions, develop policy recommendations and share resources and ideas

HOW WE STACK UP

Even though we have made progress in growing our bioscience sector in recent years, several gaps remain. We need to expand our research infrastructure, our bioscience workforce and the amount of capital we invest in bio start-ups to become a major bioscience center.

RESEARCH INFRASTRUCTURE NECESSARY

Significant investments in higher education and in research infrastructure will be needed to recruit and retain faculty and researchers. Unfortunately, state funding for higher education

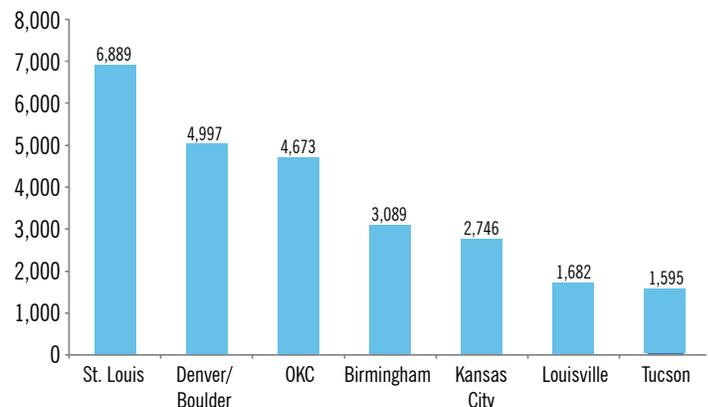
decreased 5.6 percent in Oklahoma during the 2009-10 year (when nationally the decline was only 1.1 percent), which would have enabled us to fund additional research at the state's universities and research institutions. We also failed to make much-needed investments to fully fund EDGE.

Oklahoma's biomedical institutions participated in 267 active clinical trials in 2009, ranking us 30th among the states. We have also increased our National Institute of Health awards from \$88 to \$97 million since 2004, bringing \$9 million in new bio investment to our state, ranking us 30th nationally.

GRADUATING TALENT

States that are able to provide an educated, skilled workforce will be the most successful in growing and sustaining a strong biosciences economy over the long term. The Greater Oklahoma City region is graduating more students with bioscience degrees than nearly all of the benchmark cities, except for St. Louis and Denver/Boulder. In 2008 alone, 4,673 bioscience degrees were awarded in this region.

Bioscience Degrees Awarded in Oklahoma City & Benchmark Cities - 2008



RAISING CAPITAL

The costs associated with the discovery of new knowledge and the development of new technologies is expensive. In addition to the research phase, large amounts of capital are needed for longer periods of time to fund business growth and economic development. There are costs involved in market analysis, pricing, developing prototypes, preparing marketing and sales plans and manufacturing. Once the product is developed, there are also costs for distribution, sales and marketing.



NATIVE GRASS NIRVANA

It may sound a little far-fetched, but what if there is a native grass that has been in Oklahoma for hundreds of years that has the potential to become an inexpensive cash crop and a resource for feed, erosion prevention, and biofuels?

Researchers and scientists at The Samuel Roberts Noble Foundation in Ardmore are turning this big “what if” into reality. Switch grass is a vigorous, native grass that holds tremendous promise for our state’s economic future. Working in the lab and in the field, Drs. Kelly Craven, James Rogers and Jagadeesh Mosali are raving fans of switch grass.

Craven, a principal investigator in one of The Noble Foundation’s 21 labs, is investigating how fungi, his “organism of choice,” can make switch grass stronger, fitter, and more drought-tolerant and nutrient-friendly. If he can establish that fungi does all these things in the lab, this super-switch grass may be in farmer’s fields within the next five years.

For farmers, switch grass has the potential to thrive on even marginal land without requiring as much fertilizer or water as other crops. The deep root system will prevent erosion and place carbon back in the soil. Switch grass is also a cost-effective source of cellulose for the production of ethanol.

Craven explains his fascination with fungi by saying that, “many organisms are out there cooperating and working together for good. We all need to be stewards of the land, and this work will help us discover how cooperating organisms contribute to our ecosystem.”

Rogers and Mosali are focused on the establishment of switch grass in the field. They believe that existing forages on Oklahoma farm land could be replaced by switch grass using no-till methods. The advantage for farmers is an alternative cash crop to corn and soybeans.

“As a state, we do a good job of producing forage,” Rogers explains. “Switch grass has the potential to enhance the quality and production of cattle by extending grazing seasons and providing higher weight gain and performance of cattle.” Switch grass is a multidimensional crop that offers other advantages, according to Mosali. “Farmers will be able to graze cattle on switch grass, and then sell the left over biomass for

“We all need to be stewards of the land, and this work will help us discover how cooperating organisms contribute to our ecosystem.”
-Dr. Kelly Craven



the production of biofuels. Basically, switch grass can be used for grazing, hay or cellulose.”

All three Noble Foundation researchers see tremendous potential for rural economic development and job creation. The Noble Foundation, Oklahoma Bioenergy Center, OSU and OU are working together to address the entire spectrum, including the establishment, fertility, harvesting, storage, transportation and commercialization of switch grass.

“We are getting an entire industry off the ground,” Mosali said.

ADVANTAGES OF SWITCHGRASS

- *Can be grown on marginal lands*
- *Makes suitable habitat for nesting / invertebrates*
- *Cost-effective source for ethanol production*

Decreased windflow and evaporation

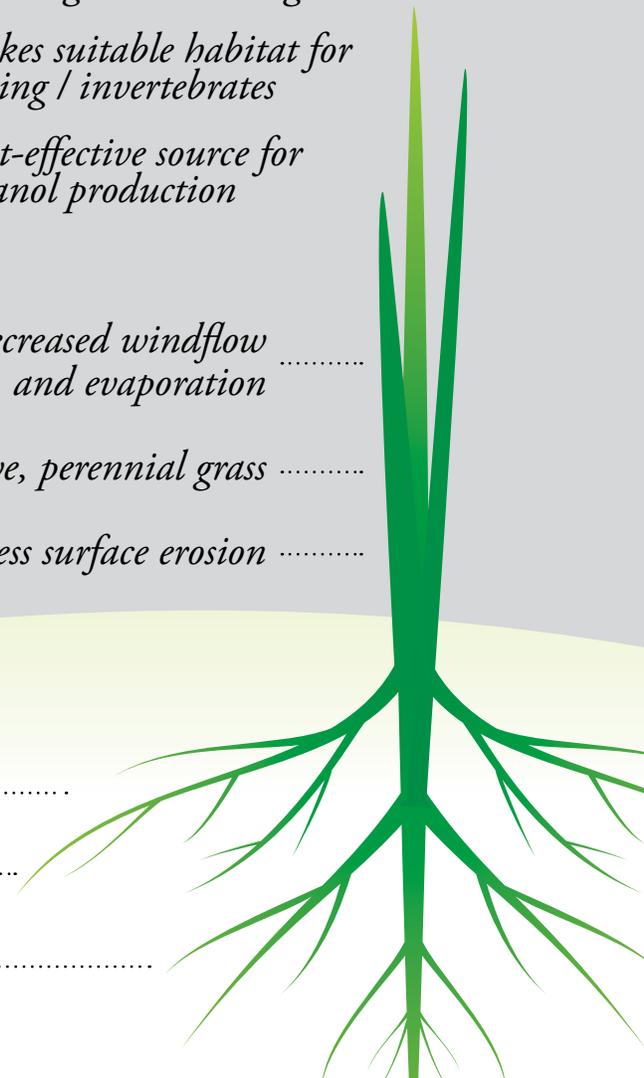
Native, perennial grass

Less surface erosion

Deep root system prevents erosion

Places carbon back in soil

Requires less water / fertilizer

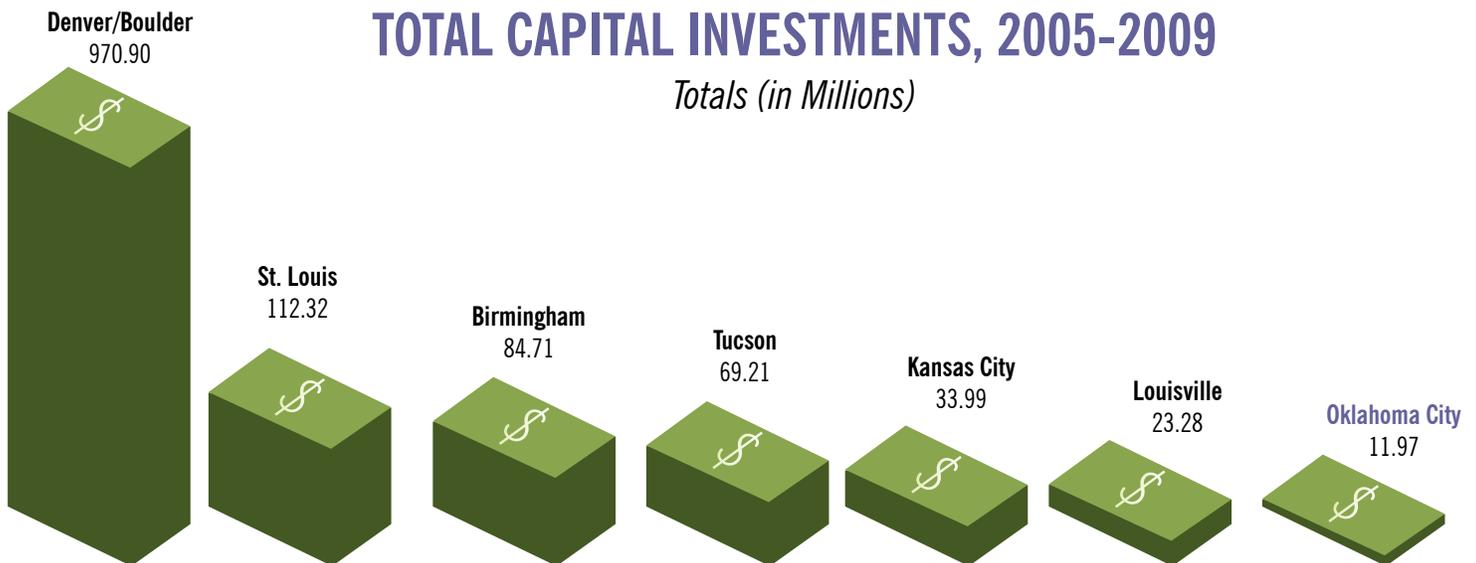


BIOSCIENCE ROAD MAP

Strategy	Action	Priority	Time Frame
Strategy One: Continue to grow the region's bioscience research and development base and accelerate commercialization.	Action One: Form a non-partisan group to recommend a state funding stream to fully fund EDGE, and use it to support research, commercialization and bioscience industry development.	Critical	Immediate
	Action Two: Develop a legislative agenda to fund growth in bioscience R&D and commercialization at the state's universities and research institutions.	High	Immediate
	Action Three: Convene an industry/university panel to review policies and procedures that affect university/private sector collaborations to streamline tech transfer processes and accelerate the number of licenses and start-up companies.	High	Immediate
	Action Four: Support the formation of technical networks and scientific interest groups that share information across disciplines and institutions.	Medium	Immediate
Strategy Two: Ensure Greater Oklahoma City grows, attracts and retains bioscience talent.	Action One: Identify experienced bioscience managers, researchers and technicians with ties to Oklahoma, make them aware of opportunities and recruit them to the state.	High	Immediate
	Action Two: Support and expand Executive-in-Residence programs and efforts to match start-up companies with mentors.	High	Immediate
Strategy Three: Grow the region's bioscience cluster by supporting the expansion of existing firms, the creation of new firms and the attraction of firms to the state.	Action One: Launch a bioscience retention, expansion and recruitment effort targeting companies best served by the region's research and technology base.	Critical	Ongoing
	Action Two: Inventory core competencies of the state's bioscience companies and create a searchable database featuring each firm's capabilities, products and services.	High	Ongoing
	Action Three: Leverage OSU's Food and Agricultural Products Center to better support the emerging bioagricultural industry.	High	Mid-Term
	Action Four: Re-energize the state's commitment of funds for the Oklahoma Bioenergy Center and market it to industry and other private partners.	High	Mid-term
	Action Five: Continue collaboration between OSU and The Noble Foundation aimed at further developing the state's bioagricultural research base.	High	Ongoing
Strategy Four: Build a comprehensive venture capital infrastructure that develops local resources and attracts additional national and international resources to Oklahoma.	Action One: Increase funding for the Oklahoma Seed Fund and the Technology Business Financing Program. Consider restructuring the TBFP.	Critical	Immediate
	Action Two: Enact legislation creating early-stage investment incentives.	Critical	Immediate
	Action Three: Expand SBIR outreach, provide increased technical assistance to applicants and provide matching funds for Phase I awards.	High	Short-term

TOTAL CAPITAL INVESTMENTS, 2005-2009

Totals (in Millions)



Even though a number of steps have been taken to address the need for early-stage capital in the Greater Oklahoma City region since 2005, there is still very little private venture capital being invested in Oklahoma bioscience companies. The Oklahoma Seed Capital Fund, the EDGE Endowment Fund and the Oklahoma Life Science Fund II are having some impact, but are still underfunded. The region's competitiveness is impacted by the fact that bioscience venture capital investments in this region are significantly lower than all of the benchmark cities. This lack of funding creates a fundamental disadvantage for our region in this critical area of the industry and can stymie otherwise positive and beneficial efforts made in other areas of the bio industry in Greater Oklahoma City. A comprehensive venture capital infrastructure that develops local resources and attracts additional national and international resources must be established to prevent loss of achievements made in the recent past.

SUCCESS MEASURES

We know our strengths and challenges, and are more committed than ever to achieving the following performance goals during the next five years. However, achieving these goals will not be possible unless our state invests in the strategies identified in this plan.

- **Grow the region's academic R&D base at a rate equal to or greater than the national average**
- **Increase NIH funding to \$120 million by 2015**
- **Increase medical devices employment at a rate at or above the national average**

- **Increase research testing and medical lab employment at a rate at or above the national average**
- **Establish at least one Oklahoma-based venture capital fund focused on the biosciences with \$75 to \$100 million under management**
- **Create at least three new angel investor networks and increase the number of angel investments**
- **Oklahoma's universities and research institutions will equal or exceed the national average in:**
 - Licenses executed per \$10 million of sponsored research
 - Start-ups per \$10 million of sponsored research
 - Start-ups per licenses executed

Collectively, OKBio, the Greater Oklahoma City Chamber, the region's research institutions, economic development organizations and state government must take responsibility for implementing the strategies in this plan, measuring our progress annually and letting our stakeholders, bioscience community and citizens know about our successes. After all, with high wages, high job creation potential, high educational attainment and high positive economic impact across a variety of sectors, a strong biosciences sector means a strong overall economy and a better quality of life for all Oklahomans.



AN ACTION AGENDA: ACHIEVING OUR BIO VISION

The future of the Greater Oklahoma City region's economic growth is directly linked to growth in the bioscience sector. The pathway to success is challenging, straightforward and definitely achievable.

Here are the high-impact critical priorities that will help create the future we envision for our community, our families, our friends and ourselves.

CRITICAL PRIORITIES

Several priorities must be addressed quickly and immediately. Here are the actions we must take in the coming year to stay competitive:

1. Ensure adequate legislative funding for the state's universities and research institutions to continue to grow their bioscience R&D and commercialization capabilities.
2. Fully fund EDGE to support research, commercialization and bioscience industry development and forming a non-partisan group to recommend a state funding stream and legislative strategy.
3. Support and expand Executive-in-Residence programs and efforts to match start-up companies with mentors.
4. Undertake a bioscience retention, expansion and recruitment initiative targeting companies that could benefit from the region's research and technology base.

The bioscience industry has a regional impact that is even greater than its total direct employment or earnings might suggest.

GREATER OKLAHOMA CITY BIOSCIENCE STRATEGY STEERING COMMITTEE

Carl Edwards, Price Edwards & Co. (Committee Chair)

Mark Funke, Bank of Oklahoma (Bioscience Vice Chair)

Mike Anderson, Presbyterian Health Foundation

Sean Bauman, Immuno-Mycologics Inc.

William Canfield, Genzyme/Cytovance

ECONOMIC IMPACT OF BIO IN OKC

The Greater Oklahoma City region has committed to making the biosciences a key driver of its economy. The industry directly employed more than 27,000 workers across 358 individual business establishments in 2008. The full value of this high-value, growth sector of the economy, however, goes well beyond the direct level of employment and earnings within the sector. The biosciences, like other industries, have interdependent relationships with suppliers of other goods and services. The sector both supports and depends upon other regional entities to supply everything from marketing or legal services to transportation or janitorial services to assist in running daily operations. As a result, the industry has a regional impact that is even greater than its total direct employment or earnings might suggest.



To determine the total economic impact of the bioscience sector on Greater Oklahoma City's economy, the Greater Oklahoma City Chamber contracted with Battelle Technology Partnership Practice to conduct an independent assessment of the economic impact of the bioscience sector on the region's economy. The analysis showed that the biosciences are indeed an important driver of Greater Oklahoma City's economy.

KEY FINDINGS:

- Greater Oklahoma City's Bioscience sector **employs 27,800** workers with total employee compensation of \$1.5 billion.
- Firms in the Bioscience sector have **annual revenues of \$4.1 billion**.
- The combined direct and indirect impacts associated with the Bioscience sector contribute **\$6.7 billion in total economic activity** to the region, and support **51,000 jobs earning \$2.2 billion in wages**.
- The Biosciences **generate an estimated \$227 million in state and local taxes** just as a result of its direct and indirect employment.
- The Biosciences sector **includes hospitals, non-hospital Bioscience firms, and Bioscience academic R&D.**

Michael Carolina, Oklahoma Center for the Advancement of Science and Technology (OCAST)

Michael Cawley, Samuel Roberts Noble Foundation

Kelvin K. Droegemeier, University of Oklahoma

Joseph Ferretti, University of Oklahoma Health Sciences Center

Glen Johnson, Oklahoma State Regents for Higher Education

Robin Roberts Krieger, Greater Oklahoma City Chamber

Hershel Lamirand, Oklahoma Health Center Foundation

Stephen McKeever, Oklahoma State University

Michael Moradi, Venture Development Associates, LLC

William Paiva, Oklahoma Life Science Fund II

Steven Prescott, Oklahoma Medical Research Foundation

Paul Risser, EDGE

Scott Rollins, Selexys Pharmaceuticals

Natalie Shirley, Oklahoma Department of Commerce

Sheri Stickley, Oklahoma Bioscience Association

Tom Walker, i2E

Roy Williams, Greater Oklahoma City Chamber

Stanton L. Young, Stanton L. Young Companies



www.okcchamber.com
www.greateroklahomacity.com
www.okbio.org

For a complete copy of the Battelle report or for
additional information, please go to
www.greateroklahomacity.com/bio

G R E A T E R
O K L A H O M A C I T Y
C H A M B E R

123 Park Ave., Oklahoma City, OK 73102 | 405.297.8900