

Ohio Bioscience Growth Report

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2007-08

About this report

The Ohio Bioscience Growth Report is published to communicate to various interested parties on the progress of the bioscience industry in Ohio. The Report is published annually by BioOhio, the state's bioscience membership and development organization.

The data that provides the foundation of the Report is drawn from a wide array of recognized industry and governmental sources. When possible, trending of data is used to illustrate performance over the past few years. In addition, some primary and secondary research is employed to supplement and aggregate larger data sets.

The primary intent of the Report is to factually document Ohio's performance in the bioscience industry during 2007. However, we used latest available data for a few categories and included observations on bioscience activity reported in Ohio during 2008.

An online version of this report may be accessed at www.bioohio.com/pdfs/growthreport08.aspx. Questions, comments, or contributions for a future Ohio Bioscience Growth Report may be directed to BioOhio Vice President John F. Lewis, Jr., jlewis@bioohio.com.



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Introduction by BioOhio President & CEO Anthony J. Dennis, Ph.D.

In the past year Ohio has emerged as one of the leading bioscience states in the nation.
But don't just take our word for it.

In *Business Facilities Magazine's* comprehensive assessment of each state's "Biotech Strength" measuring more than 20 criteria, Ohio is ranked #4 in the nation behind Pennsylvania, California and Massachusetts. In AdvaMed's *State Impact of Medical Technology Industry Report*, Ohio ranks 10th in the number of medical device employees. *R&D Magazine* annually rates the top 100 technological innovations made in the U.S., and this year Ohio can boast of 10 of those 100, more than any other state except California. Ohio remains among the national leaders in most "Best Hospitals" as ranked by *U.S. News and World Report*, and in the quality and quantity of clinical research and trials.

Ohio's research medical centers continue to add much needed jobs and either directly or indirectly employ 252,195 Ohioans. Agricultural bioproducts ranging from biofuels to biopolymers are emerging as a potentially significant alternative to a major portion of current petroleum based products.

These significant, strategy driven improvements in Ohio's bioscience industry could not have come at a more opportune time. While the current global economic crisis will affect every industry sector including ours, the bioscience community in Ohio will weather the storm better than any other and is poised for explosive growth when the economy recovers.

In fact, there has never been a better time for new starts with significant platform technologies that can be matured during the downturn and be ready for prime time when the recovery occurs. Technological advances will continue to be the fuel behind the growth of our industry and that technology will continue to be the source of new products that improve and save lives.



About BioOhio

BioOhio is a non-profit organization that helps develop and promote bioscience industry, research and education in Ohio. As Ohio's bioscience membership and development organization, BioOhio focuses on growing the considerable bioscience assets of Ohio by networking regional, national and global resources from all sectors.

The organization was first founded in 1987 as the Edison BioTechnology Center and also operated under the name Omeris from 2002-2006. Rebranded in 2007, BioOhio now celebrates its 22nd year of accelerating bioscience in Ohio.

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In addition to the BioOhio staff, we would like to sincerely acknowledge the research, editing and assistance of David Mette, University of Toledo (May 2010) and Vinny Kumar, University of Pennsylvania (May 2009), as well as the layout and design work by Steve Molnar.

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Table of Contents

5	Economic & Census Update
8	Total Economic Impact
11	Research Indicators
14	Investment Indicators
18	Concluding Remarks
20	Appendix
24	Regional data

Economic & Census Update

With its numerous and relatively high-density cities, Ohio is the 7th largest state in the nation and home to 11.5 million people. Just under half of all Ohioans live in the three largest metro areas: Columbus, Cleveland, and Cincinnati.

Ohio's Gross Domestic Product (GDP) grew at a rate of 3.26% in 2007. This growth compares favorably with the 2006 growth rate of 2.81%. Over \$466 billion in goods and services were produced in Ohio in 2007. If Ohio were a country, its GDP would rank it as the 18th largest in the world. In global terms, Ohio's economic production ranks just below Turkey, and above countries such as Belgium, Indonesia, Sweden and Switzerland.

In 2007 and into 2008, bioscience, medical technology, and research organizations have continued to expand in Ohio. Despite a tumultuous global economy, Ohio's bioscience industry is displaying sustained growth fueled by strategic state investment, favorable industry trends, and a qualified and plentiful workforce.

The biosciences are a diverse and often converging group of industries and activities with a common link — they apply knowledge to develop solutions that sustain, restore and improve the quality with which humans, plants, and animals function and utilize biological products to address unmet needs in our world. BioOhio describes the bioscience economy as having three integrated segments:

- Commercial Bioscience Industry
- Medical Colleges
- Hospitals and Healthcare

The majority of this report focuses on the commercial bioscience industry, which spans pharmaceuticals and therapeutics, medical device and equipment manufacturers, research and development facilities, medical laboratories, diagnostic imaging centers and agricultural feedstock and chemicals (agbio)

and their respective infrastructures. Additional detail on the economic impact of Ohio's medical colleges also has been included in this year's report.

Number of Bioscience Organizations

Research conducted by BioOhio through December 2008 indicates at least 1,141 bioscience-related entities were operating in Ohio. These organizations range from the very large to the very new. While company launches and relocations explain some of the 39.5% increase since last year's count (818), the expansion is mostly attributable to a more thorough census of organizations. For instance, 636 Ohio companies are FDA-certified to manufacture medical devices and 88 facilities in the state are FDA-certified to manufacture pharmaceuticals. BioOhio determined that nearly half of these companies are actively involved in the value chain of at least one commercial bioscience product.

Ohio's pillar bioscience companies include Procter & Gamble, Battelle, Abbott Nutrition, Cardinal Health (the state's largest corporation), Meridian Bioscience, Ethicon Endo-Surgery, STERIS, Boehringer Ingelheim's Ben Venue Laboratories and Roxane Laboratories, Kendle International and Philips Medical, among many others. Several of these businesses have expanded their Ohio operations significantly in the past two years.

Emergent bioscience organizations in Ohio continue to attract market and investor attention, such as AcelleRx, Arteriocyte, AssureRx, Click4Care, Franklin & Seideman, CleveX, OrthoHelix Surgical Design, Symbionix and many more. The early stage technology and promising innovation demonstrated by companies such as these provide the seeds for Ohio's commercial and clinical bioscience products of the future.

Battelle
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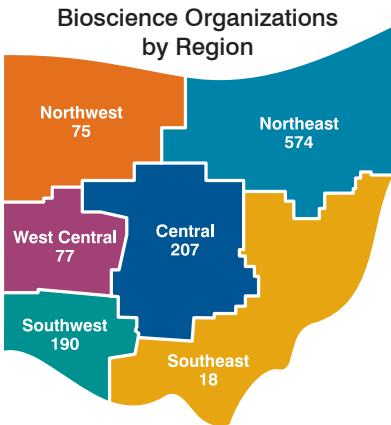

Kendle
INTERNATIONAL INC.

 **Meridian**
Bioscience, Inc.

As of December 2008,
at least 1,141 bioscience-
related entities call
Ohio home.

Distribution of Organizations by Region

The geographical distribution of Ohio's 1,141 bioscience organizations is consistent with previous years. More than half of Ohio's bioscience entities are located in northeast Ohio, which includes the Cleveland area, Akron, Canton, and Youngstown. Southwest Ohio, anchored by Cincinnati, and central Ohio, which includes the capital Columbus, are each home to about 20% of the state's bioscience-related entities.

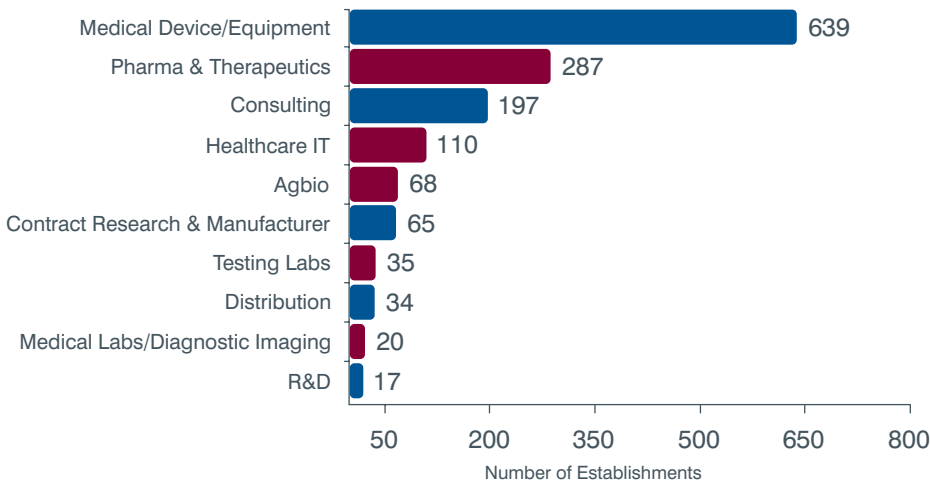


Distribution by Industry Segment

The medical device and equipment sector continues to claim more than 50% of Ohio's bioscience entities. Companies in this sector develop, manufacture and distribute medical devices and equipment including cardiovascular stents, laboratory products, replacement orthopedic joints, walkers, wheelchairs and advanced bioimaging tools, just to name a few. Ohio's strength in medical devices and equipment is a natural outgrowth of the state's advanced manufacturing and logistics expertise converging with extensive bioscience research activity.

The pharmaceutical and therapeutics sector retains its second place position with 287 entities, up from 195 in last year's report. A growing number of bioscience-focused professional consulting firms establish the consulting sector solidly in third.

Bioscience Organizations by Category



*One company may be categorized within more than one area
Source: BioOhio database

Expansions

Ohio is a perennial leader in business expansion of all types. Ohio has won *Site Selection* magazine's Governor's Cup three of the last five years (2003, 2006, and 2007). The Governor's Cup is awarded to the state with the most new or expanded capital projects.

New facilities and expansions serve as indicators of the growth of Ohio's commercial bioscience industry. From 2005 through 2007, 100 bioscience-related companies have either expanded operations or announced new facilities in Ohio; 36 projects occurred in 2007. Noteworthy 2007 examples include: Philips Medical expanding R&D space for their imaging systems in Highland Heights; growing

CROs like Kendle International in Cincinnati, Charles River Labs in Spencerville, and WIL Research in Ashland; Ben Venue Labs' new 244,000 square foot facility; and Cardinal Health breaking ground on a \$50 million, 250,000 square foot facility at its Dublin, Ohio, headquarters.

In 2008, this expansion and attraction trend continued, especially among companies involved in pharmaceutical development and manufacturing. Prasco Pharmaceuticals opened a new 28.5 acre campus in Mason. Medpace, a Cincinnati-based CRO, announced an expansion that will create or retain a combined 792 jobs. PharmaForce announced a \$35 million sterile injectable facility, expected to bring 200 additional jobs to the Columbus area. And Blue Ash-based Advanced Testing Laboratories announced an expansion that will double its footprint and add 200 jobs.

New Bioscience Organizations

From 2004 to 2007, an average of 66 new companies began operation in Ohio each year. In 2007, Ohio welcomed 60 bioscience organizations by way of new company launches or companies establishing their first facility in the state. Eight of those additions are companies that migrated to Ohio from other states — like California and Pennsylvania — or other countries — such as Israel, Japan, and Australia.

Ohio's newest bioscience companies encompass a broad range, from drug discovery to clinical trial management to medical devices. Akebia Therapeutics in Cincinnati is a drug development company

working on treatments for anemia and peripheral artery disease. NanoLogix is a leading innovator in the research, development, and commercialization of nanobiotechnologies applications and processes. Freedom Meditech is developing an entirely new approach to non-invasive ocular glucose measurement for people with diabetes. Toledo-based Ceuticare is commercializing a turnkey medication therapy management system. Transplanted from Florida in 2008, ViewRay is developing MRI-guided radiation therapy for cancer patients.

In 2007, the northeast Ohio region, anchored by Cleveland and Akron, continued to develop and attract the largest percentage of the state's new bioscience organizations (52%), including Syncro Medical in Youngstown and Niche-Vision in Akron. Southwest Ohio also was popular for additions, as nearly one-quarter (23%) of Ohio's new bio organizations located in the region surrounding Cincinnati in 2007. An innovative organ transplant solution is the centerpiece of Atabios Therapeutics, which joined the growing ranks of companies commercializing technology from Cincinnati Children's Hospital Medical Center. In Columbus, Traycer Systems is meeting milestone after milestone as it perfects new imaging tools for breast cancer. And new company activity has stepped up in Toledo in 2008 with ADS Biotechnology developing PEG-modified albumin and Esclapeus Biopharmaceuticals working on developing a small molecule intervention for obesity.

Expansions & New Facilities: Notable Examples (2007-08)

Year	Company	City	Jobs Created	Investment
2008	Advanced Testing Laboratory	Blue Ash	200	\$2,000,000
2008	Affymetrix	Warrensville Heights	61	\$3,400,000
2008	GammaStar Medical Systems	Beachwood	35	\$4,100,000
2008	Medpace	Cincinnati	792	\$23,000,000
2008	Norwood Medical	Dayton	50	\$5,200,000
2008	PharmaForce	New Albany	200	\$35,000,000
2008	Ricerca Biosciences	Concord Twp	22	\$3,800,000
2008	Integra Life Sciences (Theken Spine)	Akron	10	\$3,000,000
2008	ViewRay	Oakwood	93	\$13,500,000
2008	WIL Research Laboratories	Ashland	100	\$1,200,000
2007	Amylin Pharmaceuticals	West Chester Twp	500	\$400,000,000
2007	Ben Venue	Bedford	175	\$139,000,000
2007	Buckeye Biofuels	Toledo	40	\$220,000,000
2007	Cardinal Health	Columbus	675	\$50,000,000
2007	Charles River Laboratories	Spencerville	80	\$16,000,000
2007	Kendle International	Cincinnati	75	\$4,000,000
2007	Philips Medical	Highland Heights	70	\$15,000,000
2007	Ricerca Biosciences	Concord Twp	125	\$15,000,000
2007	SpineMatrix	Akron	76	\$1,200,000

Since 2006, new organizations have migrated to Ohio from 13 states and 9 foreign countries

Total Economic Impact

Economic Impact

Direct Effects...

from bioscience expenditures and/or production values.



Indirect Effects...

from business-to-business purchases as a result of bioscience industry.



Induced Effects...

on all local industries as the result of new household income generated by direct and indirect effects of the bioscience industry.



Total Impact:

The sum of the direct, indirect and induced effects.

In order to measure the dollars that are generated within Ohio due to bioscience activity, many factors are considered, including:

- total bioscience industry spending on goods and services within the state
- spending of bioscience-related staff and visitors
- all business volume generated as a byproduct of bioscience sector activity

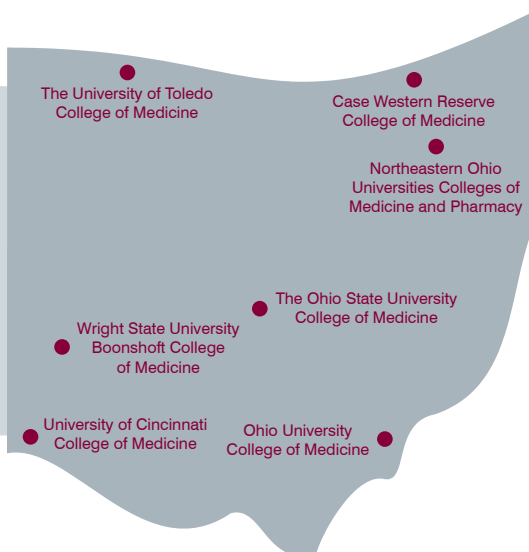
BioOhio again partnered with Pittsburgh-based consulting firm Tripp Umbach, which employed the IMPLAN input-output model to estimate the impact of bioscience economic events in Ohio. The IMPLAN model compiles cross-sectional data at the national, state and county level to construct a comprehensive, accurate database with a consistent structure. The IMPLAN model is widely used by researchers in industry, government and academia. This methodology allows BioOhio and Tripp Umbach to track specific impacts throughout the Ohio state economy by industry segment (NAICS codes). Annual 2007 employment figures within specific bioscience industry NAICS codes were collected from the U.S. Department of Labor, Bureau of Labor & Statistics Quarterly Census of Employment & Wages (QCEW).

Ohio's bioscience industry is comprised of three primary components: commercial bioscience, medical colleges, and hospitals and healthcare providers. In 2007, the total economic impact of Ohio's bioscience industry was \$148.2 billion, up slightly from \$146 billion in 2006. This figure represents 15.7% of Ohio's total economic output of \$941.8 billion. The overall bioscience industry — again, including commercial entities, academic medical colleges, and the health-care delivery system — directly and indirectly generates nearly 1.4 million jobs in Ohio or approximately 1 in every 4 Ohio workers.

Hospitals, healthcare providers, and Ohio's seven medical colleges are responsible for the largest share (90%) of bioscience-related jobs, including doctors, researchers, nurses, ancillary medical staff, and laboratory technicians, among many other professions. State-wide and regional summary findings from Tripp Umbach's 2007 impact analysis for the Ohio Council of Medical Deans are included in the report appendix. This previous study quantified the operational and employment impact of Ohio's medical colleges.

Ohio Medical College Economic & Employment Impact

Region	Economic Impact	Employment Impact
State of Ohio	\$22.2 billion	252,195 FTEs
Northeast	\$9.3 billion	105,046
Northwest	\$1.6 billion	18,815
West Central	\$3.0 billion	35,445
Central	\$2.8 billion	42,043
Southeast	\$2.9 billion	22,365
Southwest	\$2.5 billion	28,480



The commercial bioscience sector accounts for more than 50,100 direct jobs in Ohio's economy, again a slight increase over 2006 numbers. This includes a diverse range of occupations, such as toxicologists, clinical trial coordinators, manufacturing engineers and managers, lab and imaging technicians, food technologists, bioinformatics software developers, bioscience entrepreneurs, and much more.

Economic Impact by Segment

Bioscience is an evolving field, therefore sub-categorization can be difficult. However industry and research surveys often arrange the commercial bioscience industry into these segments:

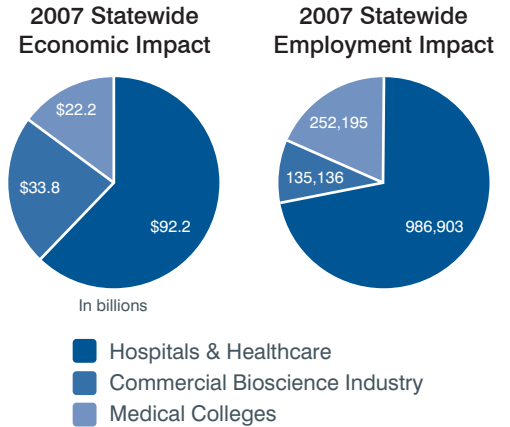
- Pharmaceuticals & Therapeutics
- Medical Device & Equipment Manufacturers
- Testing Laboratories
- Agricultural Feedstock and Chemicals (Agbio)
- Research & Development
- Medical Labs & Diagnostic Imaging Centers
- Miscellaneous

The table to the right summarizes economic impact by segment while also highlighting relative regional strengths. Agbio, pharmaceuticals, and medical device and equipment continue to be the dominant industry segments in Ohio. Northeast Ohio prevails in medical device and equipment along with the testing labs segment, while southwest Ohio leads the state in pharmaceutical economic impact and central Ohio in research and development.

Segment	2007 Direct Economic Output Impact	2007 Direct Employment Impact	Leading Region
Agbio	\$10.7 billion	5,840	Northeast
Pharmaceuticals & Therapeutics	\$2.7 billion	5,074	Southwest
Medical Device & Equipment Manufacturers	\$2.8 billion	9,757	Northeast
Research & Development	\$1.6 billion	12,415	Central
Medical Laboratories & Diagnostic Imaging Centers	\$929 million	7,570	Southwest
Testing Laboratories	\$712 million	5,843	Northeast

Agricultural biotechnology, the application of bioscience and biotechnology to the processing of agricultural goods and the production of feedstock and chemicals, including the production of biofuels, is the leading commercial bioscience subsector by output in the state. Examples of products include fertilizers, ethanol fuel, biodegradable material synthesized from plant-based feedstock, biocatalysts, corn oil and soybean oil. While agricultural biotechnology assumes a significant share of bioscience's economic impact in Ohio, the number of agbio entities (70) reported within this document is moderately undercounted. Agricultural feedstock and chemicals fall outside of BioOhio's normal focus. BioOhio partners with the Ohio Farm Bureau, Center for Innovative Food Technologies (CIFT), Ohio Agricultural Research and Development Center (OARDC) and the Ohio BioProducts Innovation Center (OBIC), among others to accelerate economic development in the agbio commercial segment. Continued collaboration with these agricultural industry trade groups will lead to a more accurate count of the organizations involved in this important segment.

Detailed charts in the report appendix reveal that nearly every segment is represented in each of Ohio's six regions.



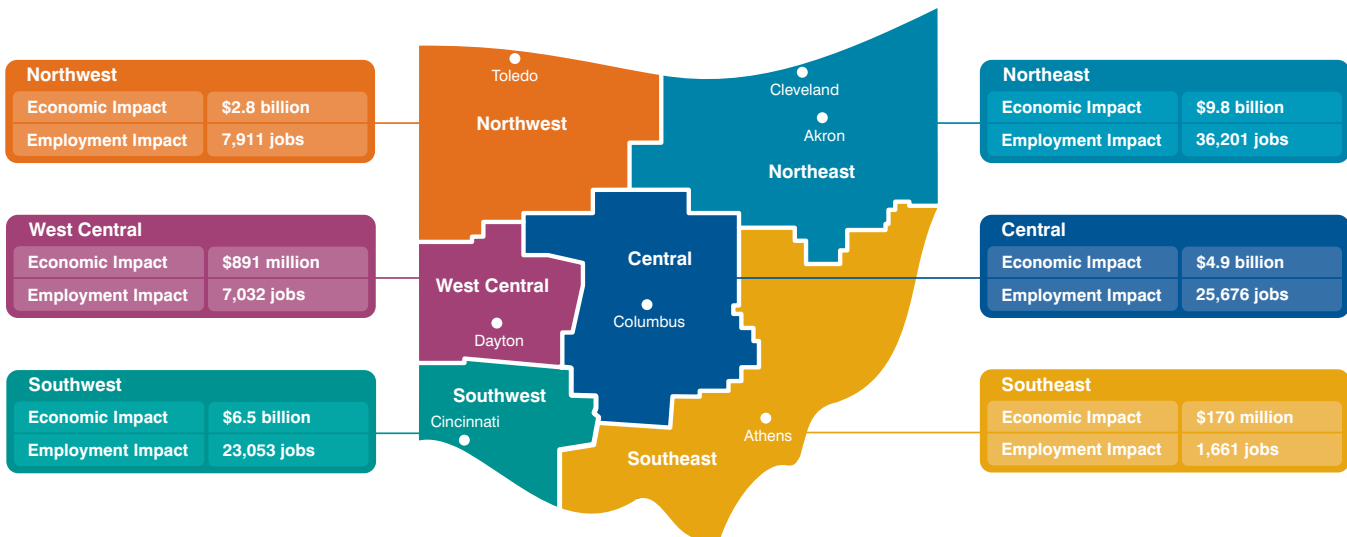
In 2007, the total economic impact of Ohio's bioscience industry was \$148.2 billion, 15.7% of Ohio's total economic output

Economic Impact by Region

A more localized view of the economic effects of Ohio's commercial bioscience industry is gained by considering the financial returns and employment figures in the state's regions. Tripp Umbach completed a regional impact analysis, based on county and metropolitan statistical area (MSA) level employment data as reported to the Bureau of Labor & Statistics (BLS) through the Quarterly Census of Employment and Wages (QCEW). QCEW gets reports from every employer in the U.S., and makes data available on a national level down to the county level. BLS withholds publication of data when necessary to protect the identity and data of cooperating employers. Totals at the industry level for states and the nation include this nondisclosable data. However, employment figures at the county or MSA level do not include the nondisclosable data; therefore, regional statistics are less robust than state or national employment figures of an industry. Likewise, economic impact figures at the regional level are affected by the nondisclosure of employment data.

Cleveland, Cincinnati, and Columbus anchor the three regions that collectively account for 85% of Ohio's commercial bioscience industry economic impact and 84% of Ohio's commercial bioscience industry employment impact (see state chart on this page). These totals include both direct and indirect economic impact and jobs supported by the commercial bioscience sector. Ohio's other three regions also are active in Ohio's bioscience economy. Combined, northwest Ohio, west central Ohio and southeast Ohio support more than 16,604 commercial bioscience-related jobs. Additional regional data is found in the report appendix.

Commercial Bioscience Sector: Total Economic Impact & Employment



Research Indicators

Ohio's wide array of higher education institutions is at the core of its strength and growth in bioscience. The effective blending of 161 higher education institutions, offering skill training, two-year, four-year, graduate and advanced degree programs, provides the education and workforce resources necessary to build and grow a bioscience organization in Ohio.

The Ohio State University, Case Western Reserve University, Ohio University, University of Cincinnati, University of Toledo, and Wright State University are among the most prominent research facilities in the nation. Impressive funding levels, the attraction of research talent, intellectual property, and the robust complementary clinical network all indicate a healthy research environment in Ohio.

Research excellence in Ohio is also driven by world-class medical centers such as the Cleveland Clinic, Cincinnati Children's Hospital Medical Center, and Nationwide Children's Hospital.

NIH Funding

Based on the most recent published data (2007), Ohio-based institutions and companies received \$628 million in NIH funding. Outpacing the U.S. average of \$421 million, Ohio's 2007 NIH awards ranked 2nd in the Midwest and 10th in the nation. Five institutions—Case Western Reserve University, Ohio State University, University of Cincinnati, Cincinnati Children's Hospital Medical Center, and The Cleveland Clinic—were among the nation's top 100 NIH funding recipients.

Among nearby states, Ohio's NIH funding surpassed Michigan (\$553 million) and Indiana (\$208 million), but still lags North Carolina, which was awarded \$931 million in 2007.

NSF Funding

In FY2007, the National Science Foundation's (NSF) Directorate of Biological Sciences awarded \$12.4 million in grants to Ohio-based organizations,

compared to \$9.8 million in FY06. Bioscience-related NSF funding was strongest in central Ohio. This concentration was the result of

Ohio State University earning nearly half (\$6 million) of total grants. In southwest Ohio, Miami University earned \$2.1 million in NSF bioscience funding.

Institution	2007 NIH Funding	National Rank
Case Western Reserve University	\$169,208,864	35
The Ohio State University	\$115,483,137	50
University of Cincinnati	\$97,589,676	62
Cincinnati Children's	\$78,579,136	70
Cleveland Clinic / Lerner	\$77,887,287	71

SBIR/STTR Funding

SBIR and STTR funding from the U.S. Small Business Administration is a widely accepted metric and peer reviewed validation of emerging technology approaching commercialization. Based on the most recent published data (2006), Ohio organizations collectively received \$97 million in total SBIR/STTR funding, significantly more than the national average. SBIR/STTR funding related to bioscience R&D in Ohio dropped slightly to \$26.7 million in 2006 from a high of \$28.9 million in 2005.

Bioscience-related SBIR/STTR Funding



Intellectual Property

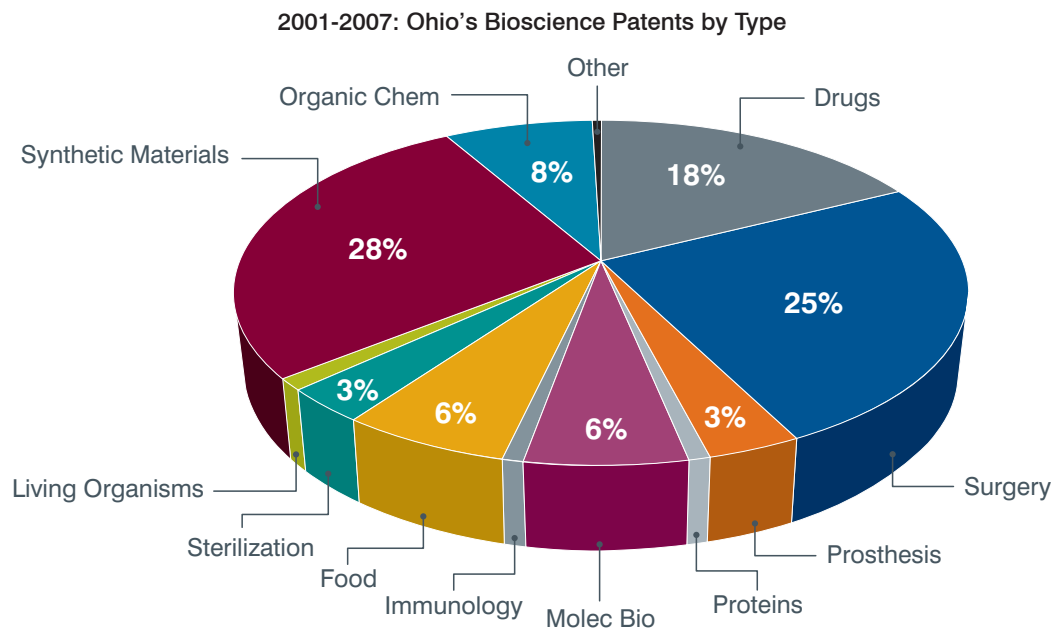
In 2007 Ohioans received 2,255 total issued patents, 357 of which were bioscience-related. From 2001-2007, 3,668 bioscience patents were issued in Ohio.

Based on the most recent data (2006) from the Association of University Technology Managers (AUTM), a recent article in *Forbes* ranked Ohio University 4th in the nation in patent and licensing return on investment (ROI). Due in large part to research on Somavert, a drug marketed by Pfizer, Ohio University's ROI in 2006 was 13%.

In a 2008 Patent Board study designed to identify the key domestic centers of medical device innovation, Columbus ranked 3rd among all metropolitan areas in patent current impact, a measure of how much a region's patents serve as a foundation for other industry patents and technologies.

This recent historical data echoes a tradition of bioscience innovation in Ohio, which also is home to the National Inventors Hall of Fame (Akron). In fact, all of these bioscience breakthroughs were invented by Ohioans:

- Surfactant protein
- Total hip replacement prosthesis
- Kidney dialysis machine
- Sabin oral polio vaccine
- First antihistamine, Benadryl
- First use of YAG1 laser to remove brain tumor
- First vaccine against the feline leukemia virus
- Heimlich maneuver



Clinical Network

The importance of translational medicine — accelerating basic research discoveries to clinical practice — makes national healthcare rankings a key component of a state's bioscience credentials.

From a total of 5,453 medical centers in the United States examined by the *U.S. News & World Report* in 2008, 14 Ohio hospitals were ranked among the top 220 hospitals in a variety of specialties, ranking Ohio among the top 5 states.

Ohio's national reputation for medical excellence also is supported by unrivaled performance in Thomson Reuters *100 Top Hospitals* rankings, which include more Ohio hospitals between 2004-2007 than any other state.

Of the 14 Ohio hospitals included in the 2008 *U.S. News & World Report* rankings, the Cleveland Clinic maintained the highest ranking as 4th overall in the nation. In addition, Cleveland Clinic's Heart Center again was named the nation's best for cardiac care — a title it has held for 14 consecutive years. The magazine's survey also ranked 16 Cleveland Clinic specialty care areas among the nation's best.

Other Ohio hospitals earning recognition in several disciplines included The Ohio State University Medical Center, with 8 top 50 specialty areas, and University Hospitals of Cleveland, with 5 adult specialty care areas ranked in the top 50.

New this year, the 2008 *U.S. News & World Report* "America's Best Children's Hospitals" rankings show that 4 of the top 15 pediatric hospitals are in Ohio — Cincinnati Children's Hospital Medical Center (3rd), University Hospital's Rainbow Babies & Children's Hospital in Cleveland (5th), Children's Hospital Cleveland Clinic (14th) and Nationwide Children's in Columbus (15th).

This robust clinical network and prominent medical reputation are primary factors leading to Ohio hosting over 16% of all clinical trials conducted in the U.S. As of November 2008, a total of 1,689 clinical trials were in progress or actively recruiting patients in Ohio, a slight increase from last year (1,540). Ohio ranks 6th among all states in this important indicator.

A majority of these trials are in either Phase II (38%) or Phase III (42%), indicating that Ohio is a prime location for validating bioscience research as it approaches commercialization. Clinical trials being conducted in Ohio predominantly focus on cardiovascular (16%) or cancer (45%) treatments.

Ohio Hospitals in 2008 "America's Best Hospitals" Rankings *U.S. News & World Report*

Children's Hospital Cleveland Clinic
Christ Hospital (Cincinnati)
Cincinnati Children's Hospital Medical Center
Cleveland Clinic
Grant Medical Center-OhioHealth (Columbus)
Kettering Medical Center
Miami Valley Hospital (Dayton)
Nationwide Children's Hospital (Columbus)
Ohio State University James Cancer Hospital (Columbus)
Rainbow Babies and Children's Hospital (Cleveland)
Riverside Methodist Hospital-Ohio Health (Columbus)
Summa Health System (Akron)
University Hospital (Cincinnati)
University Hospitals Case Medical Center (Cleveland)

Investment Indicators

From 2004-2007
\$6.27 billion have been
invested into Ohio
bioscience entities

Total Bioscience Funding

Overall, nearly \$2.5 billion were invested across Ohio to accelerate bioscience growth in 2007, almost doubling the 2006 total. The sources of funding include venture capital, angel funds, IPOs, SBIR/STTR, state biomedical grants, acquisitions, and NSF and NIH grants. The largest portion of the 2007 increase was "exit" related, as six acquisitions and two IPOs generated more than \$1 billion, 44% of total investment in Ohio bioscience ventures. Universal American Financial Corp's purchase of MemberHealth for \$630 million represented the largest investment in 2007.

Among the 44 Ohio companies attracting venture capital investment during 2007, more than half were located in northeast Ohio, such as Arteriocyte Medical Systems and Ganeden Biotech. In October 2007, Arteriocyte, Inc., and DW Healthcare Partners announced the formation of Arteriocyte Medical Systems, launching the company with a \$10 million growth capital investment. Ganeden Biotech pulled in \$12 million, led by DSM Venturing, for their line of probiotic dietary supplements. Elsewhere in Ohio in 2007, Columbus-based device companies

PercuVision (catheter) and CleveX (skin biopsy, closure and repair) each raised more than \$1.5 million from angel investor groups, and Cincinnati-based Health Pro Brands raised \$7.75 million from local venture firms River Cities and Fort Washington Capital. Eurand, a global specialty pharmaceutical company, raised \$128 million in its May 2007 IPO and has since expanded its North American headquarters and manufacturing facility in Vandalia, Ohio. Biopharmaceutical stem cell product company Athersys raised another \$65 million by going public via reverse merger in June 2007.

Venture investing and acquisitions in Ohio were steady in 2008. More than \$189 million in bioscience or healthcare venture capital investment flowed into the state during 2008, placing Ohio second in the Midwest, according to the BioEnterprise *Midwest Health Care Venture Investment Report*. Forty-three companies received equity capital in 2008. Akebia Therapeutics in Cincinnati raised \$16.5 million to further develop treatments for ischemia and vascular disease. Operating from Israel and Cleveland, Symbionix completed its Series C-round, strengthening its position as the industry leader in innovative virtual reality simulation products. Spine-Matrix, its 2003 genesis in Columbus and now based in Akron, closed on an \$8 million round of financing led by Psilos Group. MDG Medical, maker of drug dispensing technology, raised an additional \$14 million. AxioMed Spine, of Beachwood, raised a follow-on round of \$10 million including investments from four Ohio VC firms, CID Capital, Primus, Reservoir Venture Partners, and Early Stage Partners.

Funding Type	2007	2006	2005	2004
Funding in Millions \$				
VC/Angels	\$296	\$114	\$98	\$91
IPO	\$188	\$12	\$49	\$0
SBIR/STTR*	\$27	\$27	\$29	\$22
State Biomedical Partnerships (Third Frontier)	\$135	\$155	\$75	\$51
Matching Corporate Funds for Biomedical Partnerships	\$92	\$273	\$112	\$111
NSF Bioscience Grants	\$12	\$10	\$15	\$36
NIH Institutional Grants	\$628	\$627	\$717	\$691
Other Healthcare Equity Financing	\$13	\$0	\$112	\$12
Acquisitions	\$1,089	\$75	\$279	\$0
Total Bioscience Funding	\$2,480	\$1,293	\$1,486	\$1,014

* estimate based on 2006 figure

So far in 2008, six acquisitions totaling \$473 million demonstrate another profitable pathway for many bioscience companies in Ohio. Columbus healthcare software firm HTP Inc. was acquired by RelayHealth, the technology arm of McKesson. Early in its development, HTP strategically utilized the various tools that Ohio provides to emerging companies.

HTP first received state support in 2001 with a \$100,000 infusion from the Edison BioTechnology Center, since renamed BioOhio. Other investments came from angel investors who tapped into the Ohio Department of Development's Ohio Technology Investment Tax Credit program (TITC), which offers a 25% tax credit for investments in emerging R&D and tech firms. By 2004 HTP was well on its way to commercial success when it received the first ever Innovation Ohio Fund (IOF) Loan, a product of Ohio's Third Frontier Project. The initial \$750,000 loan and another for \$1.7 million assisted HTP in further developing products and services designed to support the administrative transaction management needs of the healthcare industry.

Northeast Ohio saw two major acquisitions as well. USB and their subsidiary Anatrace were purchased by Affymetrix for \$75 million. Integra Life Sciences acquired for \$200 million the Akron-based Theken family of spinal implant companies. In 2004 Integra purchased Cincinnati's Schaerer Mayfield USA, Inc. (formerly Ohio Medical Instrument Company).

Several new venture and angel funds have established a presence in Ohio, including Michigan-based Arboretum Ventures II, Boston-based Fletcher Spadt Ventures II, St. Louis-based Rivervest, and New York's Radius Ventures, among others. There are now 58 different venture and angel funds in Ohio investing in bioscience and healthcare deals.

Since 2004, over 130 investment groups have invested more than \$968 million into 104 Ohio bioscience and healthcare-related companies.

Third Frontier Project

Ohio's 10-year, \$1.6 billion Third Frontier Project was initiated in February 2002. This project is the state's largest-ever commitment to expanding high-tech research capabilities and promoting innovation and company formation to create high-paying jobs for generations to come.

Between January 2002 and June 2008, \$873 million of Ohio's Third Frontier Project funds had been competitively awarded, of which more than 50% support bioscience-related development and commercialization initiatives. As of June 2008, according to the Ohio Department of Development, total Third Frontier investments in a variety of technology growth areas have led to an additional \$3.9 billion in cost share and leveraged co-investment into Ohio while creating or retaining 6,795 jobs with an average salary of \$64,237. ODOD also reports 466 companies have been created, attracted, or capitalized.

Since 2002 more than 90 diverse biomedical projects have been funded by Ohio's Third Frontier Project, epitomizing the breadth and depth of the state's bioscience-based economic development. For more information about Ohio's Third Frontier Project go to: www.thirdfrontier.com.

Ohio Jobs Stimulus

Ohio Governor Ted Strickland signed House Bill 554 on June 12, 2008, which launched a \$1.57 billion jobs stimulus package that aims to create new jobs and lay the foundation for future economic prosperity. The largest infrastructure and jobs program in the state of Ohio in 30 years, the stimulus package is expected to help create 57,000 jobs.

Ohio's biomedical industry is one of four growth industry clusters tabbed for stimulus package funding (\$100 million) over the next three years. The \$100 million Biomedical Growth Fund will be used to help attract new companies and encourage the expansion of existing ones. Another \$50 million will be earmarked for bioproducts industry incentives, especially on finding ways to increase capacity and accelerate more bio-based products to the marketplace.

The plan also designates \$250 million for a Higher Education Workforce Initiative, which encompasses internship and co-op programs, to be coordinated by the Ohio Board of Regents.

2007-2008 Funded Third Frontier Bioscience Projects

Third Frontier Funded Bioscience Projects	Participants	State Award Amount (in millions)	Corporate/ Matching Amounts (in millions)	Year
Ohio Research Scholars and Recruitment Program	Recruitment of scholars for bioscience research is one field of interest	\$41.90	\$45.30	2007
Targeted Industry Attraction Program in the Advanced Polymers and Bioscience Industry Sectors	Zyvex Performance Materials	\$1.00	\$0.80	2007
ORCGP - Wireless Biometric Monitoring System	ZIN Technologies	\$0.34	\$0.34	2007
ORCGP - Memory Polymers	Cornerstone Research	\$0.35	\$0.35	2007
ORCGP - Complex Ceramics for Medical Applications	MetaMateria	\$0.35	\$0.35	2007
Entrepreneurial Signature Program	All six regions have bioscience as key component of their programs	\$84.80	\$43.72	2007
Facility for Developments in Diabetic Treatment	Amylin Ohio LLC	\$1.50	\$0.50	2007
Pre-Seed Initiative for Start-Up Biotech Companies	Jumpstart Inc, Cincinnati Children's Hospital Medical Center, and The North Coast Angel Fund	\$5.00	\$0.80	2007
Granular Technology for Agricultural Applications	The Andersons Inc, Ohio BioProducts Innovation Center, National Lime & Stone Company, PSB Company, Syngenta, and the US Department of Agricultural Research	\$5.00	\$2.50	2007
Functional Prosthetic Limbs for Amputee Soldiers	Cleveland Clinic's Lerner Research Institute, Ohio Willow Wood, and Cleveland State University	\$2.10	\$2.13	2008
Musculoskeletal Applications in Wound Healing and Nerve Repair	Cleveland Clinic's Clinical Tissue Engineering Center, Akron General Medical Center, Case Western Reserve University, University of Akron, and University of Cincinnati	\$4.90	\$5.02	2008
Cystic Fibrosis, Retinal Disease, and Breast Cancer Treatments	Case Western Reserve University, University Hospitals of Cleveland, Copernicus Therapeutics, Akrotome Imaging, and Polgenix, Inc.	\$3.90	\$3.98	2008
Nitric Oxide Sensor for Asthma Patients	Cleveland Clinic, NASA Glenn Research Center, The Ohio State University, Case Western Reserve University, and Makel Engineering, Inc.	\$3.80	\$4.93	2008
Chemicals Targeting Multiple Sclerosis/Neuroregenerative Therapies	Cleveland Clinic, Case Western Reserve University, and the University of Toledo	\$3.00	\$5.91	2008
Yeast-based Cloning System for Antiviral Resistance Treatment and Vaccine Development	Diagnostic Hybrids Inc, Case Western Reserve University's School of Medicine, and Apath LLC	\$5.00	\$7.04	2008
Real-time Pathogen Detection Instrument	Northeastern Ohio Universities Colleges of Medicine and Pharmacy, Pathogen Systems Inc., and Kent State University	\$3.00	\$3.00	2008
Custom Foot Orthotics for Diabetic Peripheral Neuropathy	Acor Orthopaedic Inc	\$0.35	\$0.35	2008
Speech Recognition	Think-A-Move Ltd	\$0.35	\$0.35	2008
Magnetically Guided Feeding Tube	Syncro Medical Innovations	\$0.35	\$0.35	2008
Spinal Disease Research	University of Toledo, Cleveland Clinic's Center for Spine Health and Clinical Center for Tissue Engineering	\$4.46	\$4.46	2008
Network of Biomedical Imaging	The Ohio State University Research Foundation, Case Western Reserve University, and Wright State University	\$24.87	\$28.33	2008
Layered Sensing for Synergistic View of Environment	University of Dayton, The Ohio State University, Wright State University, and Miami University	\$23.45	\$24.37	2008
Orthopaedic Research Cluster of Northeast Ohio	University of Akron and the Northeastern Ohio Universities College of Medicine	\$8.58	\$8.58	2008
Cardiovascular Repair and Tissue Engineering	Cleveland State University and the Cleveland Clinic	\$0.90	\$0.90	2008
Assemble and Test Biomedical Technology	ViewRay Inc., Cleveland Clinic, Cleveland's University Hospitals, and Philips Medical Systems	\$0.25	\$0.25	2008
Totals		\$229.50	\$194.61	
	Total (Awards and Matching Funds)		\$424.11	

Concluding Remarks

Objective and fact-based, the Ohio Bioscience Growth Report is intended to provide you a snapshot of “Bio in Ohio” during 2007-2008. We believe the comprehensive scope of this report makes it an essential tool for Ohio’s bioscience business leaders, economic development officials, and state and local lawmakers. Ohio’s aggressive and sound investment strategies in the biosciences are delivering results in the form of jobs, new and recruited companies,

and rapidly increasing risk capital. Key metrics associated with bioscience industry vitality continue to improve, and we’re confident that the 2009 Ohio Bioscience Growth Report will show sustained progress. An online version of this report may be accessed at: www.bioohio.com/pdfs/growthreport08.aspx. Questions, comments, or contributions for a future Ohio Bioscience Growth Report may be directed to BioOhio Vice President John F. Lewis Jr., jlewis@bioohio.com.



Appendix

Economic Impact Research Process, Methodology and Additional Data

Tripp Umbach and BioOhio pursued two primary research questions, “What is an encompassing definition of the bioscience industry?” and “What overall employment and output impact does the bioscience industry have on the state of Ohio?”

The nature of bioscience and biotechnology poses a challenge when a static definition is the goal. The industry continues to evolve with each scientific discovery. Simply stated, biosciences are diverse and ever-changing. To further increase the challenge of defining bioscience, the North American Industry Classification System (NAICS) does not identify a unified biosciences industry classification. To accurately identify biosciences activity in Ohio, Tripp Umbach and BioOhio used a combination of industries implicated in the bioscience definition established in “Technology, Talent and Capital: State Bioscience Initiatives 2008,” prepared for the Biotechnology Industry Organization (BIO) by Battelle’s Technology Partnership Practice and SSTI.

It is possible, in fact probable, that the major biosciences subsectors do not entirely cover the full extent of bioscience activity within the state. Firms may exist that have adopted bioscience-related technologies, but lie outside the industrial structure defined here.

The economic impact methodology utilized in this study is IMPLAN. IMPLAN is input-output modeling that describes commodity flows from producers to intermediate and final consumers. The IMPLAN software and methodology closely follows the accounting conventions used in the “Input-Output Study of the U.S. Economy” by the Bureau of Economic Analysis (1980) and the rectangular format recommended by the United Nations. This methodology allows BioOhio and Tripp Umbach to track specific impacts throughout the Ohio state economy by industry segment (NAICS codes). Annual 2007 employment figures within the specific bioscience industry NAICS codes were collected from the U.S. Department of Labor, Bureau of Labor & Statistics Quarterly Census of Employment & Wages (QCEW).

In contrast to gross domestic product by state (GDP), total economic impact measures the direct economic impact of an organization’s spending plus additional indirect spending in the economy as a result of an organization’s spending. Economic impact does not reflect an institution’s profitability or even their sustainability, since all operating organizations, even those in bankruptcy, have a positive economic impact when they spend money and attract spending from outside sources.

Total economic impact measures the dollars that are generated within the State of Ohio or other delimited geographic area due to the presence of bioscience industrial sectors. This includes not only spending on goods and services with a variety of vendors within the state, and the spending of its staff and visitors, but also dollars generated by businesses within Ohio that benefit from the spending of those bioscience sector firms.

Commercial Bioscience Sector

Building from the previously established definition, Tripp Umbach and BioOhio conducted secondary research based on Ohio-specific industry expertise to generate a working and encompassing definition of Ohio’s commercial bioscience sector.

Medical Device & Equipment Manufacturers

NAICS CODE	NAICS DESCRIPTION
333314*	Optical instrument & lens manufacturing
334510	Electromedical & electrotherapeutic apparatus manufacturing
334516	Analytical laboratory instrument manufacturing
334517	Irradiation apparatus manufacturing
339111	Laboratory apparatus and furniture manufacturing
339112	Surgical and medical instrument manufacturing
339113	Surgical appliance and supplies manufacturing
339114	Dental equipment and supplies manufacturing
339115	Ophthalmic goods manufacturing

This subsector comprises establishments that manufacture and produce healthcare products and supplies as well as biomedical instruments; examples include imaging equipment, orthopedic implants, vascular stents, surgical supplies, walkers and beds.

* Optical instrument NAICS code was not included in the BIO definition of biosciences.

Agricultural Biotechnology (Agbio)

NAICS CODE	NAICS DESCRIPTION
311221	Wet corn milling
311222	Soybean processing
311223	Other oilseed processing
325193	Ethyl alcohol manufacturing
325199	All other basic organic chemical manufacturing
325221	Cellulosic organic fiber manufacturing
325311	Nitrogenous fertilizer manufacturing
325312	Phosphatic fertilizer manufacturing
325314	Fertilizer (mixing only) manufacturing
325320	Pesticide and other agricultural chemical manufacturing

This subsector comprises establishments that apply biosciences and biotechnologies to the processing of agricultural goods and the production of organic and agricultural feedstock and chemicals, including the production of biofuels.

The final definition resulted in seven subsectors engaged in key bioscience activity that include: Pharmaceutical & Therapeutics, Medical Device and Equipment Manufacturers, Testing Laboratories, Research & Development, Medical Laboratories & Diagnostic Imaging Centers, Agricultural Feedstocks & Chemical (Agbio), and Miscellaneous. The latter captures Ohio based companies who consider themselves bioscience entities but were not included due to anomalies in the IMPLAN/NAICS modeling.

This “commercial bioscience” definition does not include clinical and health systems such as hospitals and physician offices.

Pharmaceutical & Therapeutics

NAICS CODE	NAICS DESCRIPTION
325411	Medicinal and botanical manufacturing
325412	Pharmaceutical preparation manufacturing
325413	In-Vitro diagnostic substance manufacturing
325414	Biological product (except diagnostic) manufacturing

This subsector comprises establishments primarily engaged in manufacturing medicinal chemicals, uncompounded botanicals, pharmaceutical preparations, cardiology treatments, in-vitro diagnostic substances, animal and human vaccines.

R&D and Labs

NAICS CODE	NAICS DESCRIPTION
Testing Laboratories	
339116	Dental laboratories
541380	Testing laboratories*
Research & Development	
541710	Research and development in physical, engineering and life sciences*
Medical Labs & Diagnostic Imaging	
621511	Medical laboratories
621512	Diagnostic imaging centers

* Includes a select number of these industries supporting relevant biological or other life science activities.

Testing Laboratories – This subsector comprises industries primarily engaged in manufacturing physical, chemical, and other analytical testing services as well as manufacturing dental appliances.

Research & Development – This subsector comprises establishments primarily engaged in conducting research and experimental development in physical, engineering, and life sciences.

Medical Labs & Diagnostic Imaging – This subsector comprises establishments known as medical laboratories and diagnostic imaging centers primarily engaged in producing images of the patient.

Miscellaneous

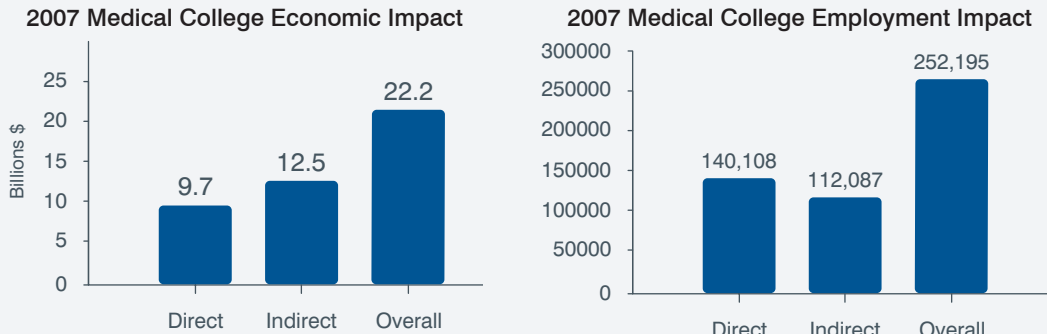
NAICS CODE	NAICS DESCRIPTION
423450	Wholesale medical and hospital equipment
424210	Druggists’ goods merchant wholesalers
511210	Pre-packaged software services
532291	Home health equipment rental
541611	Administrative management consulting services
541720	Research & development in social sciences & humanities
541910	Marketing research and public opinion polling
561110	Office administrative services
561499	All other business support services

This subsector comprises a limited portion of industries to capture 9 specific companies involved in biological and life science activities.

Medical Colleges, Hospitals, and Healthcare Providers

Two other important subsectors of bioscience are hospitals/healthcare providers and academic medical centers, or medical colleges. Operating under the current NAICS classification system, it is not possible to pinpoint specific bioscience oriented establishments within the overall healthcare sectors.

Included in this report is general information not only of Ohio's hospital segment but also a baseline of the economic impact of Ohio's seven medical colleges and affiliated hospitals. Tripp Umbach has quantified the 2007 economic and employment impact generated by Ohio's seven medical colleges and their core academic healthcare industry. The impact analysis utilized a linear cash flow methodology and was based on data supplied by the medical schools and their affiliates, and data collected by Tripp Umbach for its analysis of all Association of American Medical Colleges affiliated institutions.



* The 2007 Medical Colleges analysis was completed from a set of research tools and techniques developed for the American Council on Education (ACE). The ACE-based methodology employs linear cash flow modeling to track the flow of institution-originated funds through a delineated spatial area.

Our total economic impact analysis includes full employment calculations of healthcare related industry NAICS codes. For example, modeling includes those directly involved in bioscience related activity as well as employees engaged in registration, food service, public affairs, administration, and other non-clinical service lines. The Healthcare & Providers industry definition is comprised of the following NAICS codes: Offices of Physicians (6211-4), Home Healthcare Services (6216-9), Hospitals (622) and Nursing and Residential Care Facilities (623).

Statewide Economic Impact

According to IMPLAN state figures, Ohio's 2007 total industry output totaled \$941.8 billion. The \$33.8 billion overall operational impact of the commercial bioscience sector in Ohio accounts for 3.6% of the total state industry output.

The overall impact measures the dollars that are generated within the state of Ohio due to the presence of the bioscience industry. This includes not only the spending on goods and services with a variety of vendors within the state, and the spending of its staff and visitors, but also the business volume generated by businesses within Ohio that benefit from bioscience industry spending. Support businesses may include suppliers, lodging establishments, restaurants, construction firms, vendors, temporary agencies, etc. A third wave of impact (induced) is included as well, capturing the discretionary spending of consumers. Economic impact also differs from company revenue, so these numbers do not include, for example, Cardinal Health's entire \$91 billion revenue, but only that portion generated within the state.

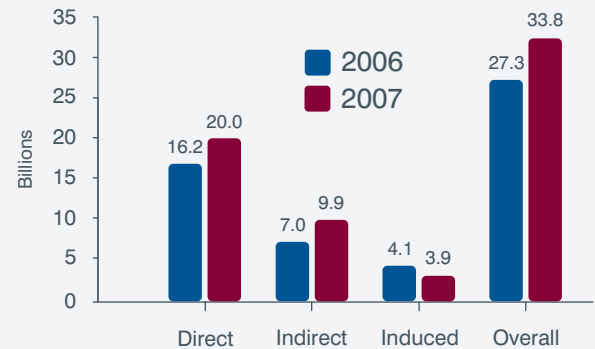
Statewide Employment Impact

The commercial bioscience sector provides more than 50,100 high paying jobs directly to Ohio's economy. When indirect and induced jobs are added, over 135,000 jobs are supported by Ohio's commercial bioscience industry.

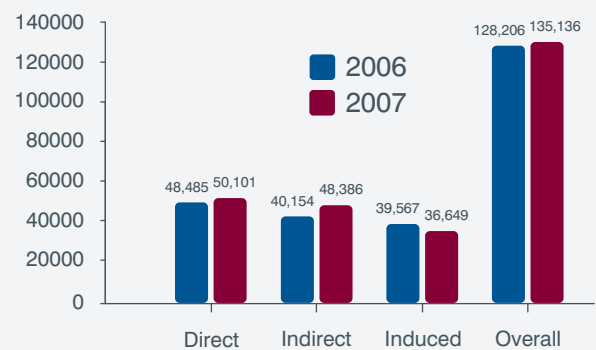
Note: The IMPLAN analysis provides researched modeling estimates of employee and operational impacts at the state and regional level. The regional impact modeling is independent of the overall state modeling, therefore employee and operational impacts are not cumulative. The impact modeling provides an overview of each region's impact and contribution to Ohio's overall commercial bioscience sector.

Direct jobs represent persons employed directly by firms defined as bioscience businesses as per the NAICS definitions. Indirect jobs are jobs that are in support of bioscience businesses in Ohio. Approximate ratio of direct to indirect/induced state employment is 1:2. This is a stronger ratio than other industries, which is typically 1 indirect job for every 1 direct job. For example, a major grocery store chain might have more employees than a local hospital, but since most of their spending goes to out-of-state vendors and since the average wages are lower, fewer indirect jobs in Ohio are created. In the healthcare industry there is typically a 1 to 1.8 ratio.

Commercial Bioscience Sector Operational Impact



Commercial Bioscience Sector Employment Impact



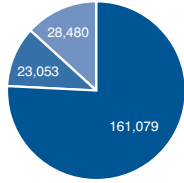
Direct Economic Impact by Sector

Industry Subsector	2006 Economic Impact	2007 Economic Impact	2006 Employment Impact	2007 Employment Impact
Agbio	\$6.2 billion	\$10.7 billion	5,540	5,840
Pharmaceutical & Therapeutics	\$3.9 billion	\$2.7 billion	4,276	5,074
Medical Device & Equipment Manufacturers	\$2.8 billion	\$2.8 billion	12,392	9,757
Research & Development	\$1.3 billion	\$1.6 billion	11,096	12,415
Medical Laboratories & Diagnostic Imaging Centers	\$793 million	\$929 million	6,388	7,570
Testing Laboratories	\$539 million	\$712 million	5,434	5,843
Miscellaneous	\$689 million	\$626 million	3,359	3,602

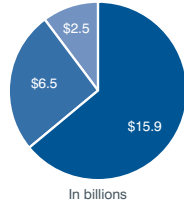
Regional Analysis

Southwest Ohio

2007 Total Employment Impact

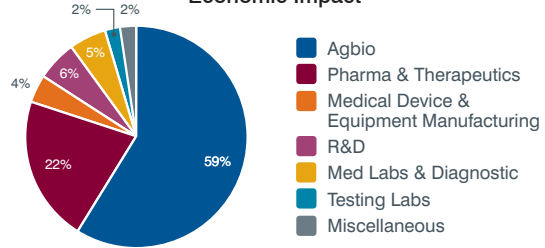


2007 Total Economic Impact



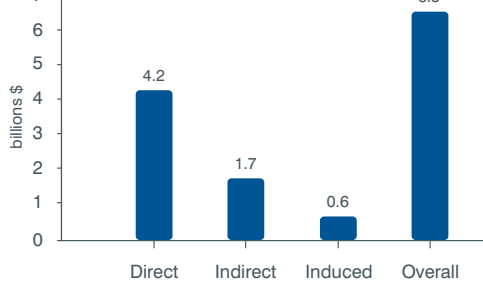
- Hospitals & Healthcare
- Commercial Bioscience Industry
- Medical Colleges

Commercial Bioscience Direct Economic Impact

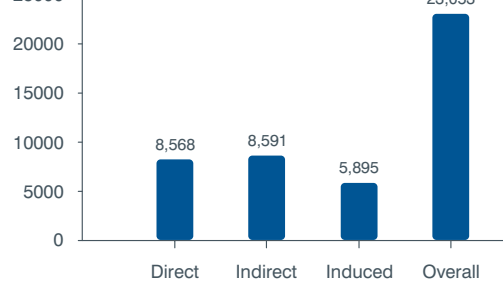


- Agbio
- Pharma & Therapeutics
- Medical Device & Equipment Manufacturing
- R&D
- Med Labs & Diagnostic
- Testing Labs
- Miscellaneous

Commercial Bioscience Economic Impact

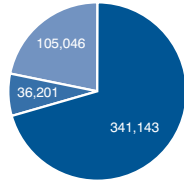


Commercial Bioscience Employment Impact

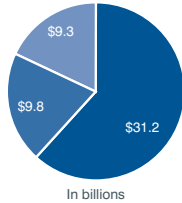


Northeast Ohio

2007 Total Employment Impact

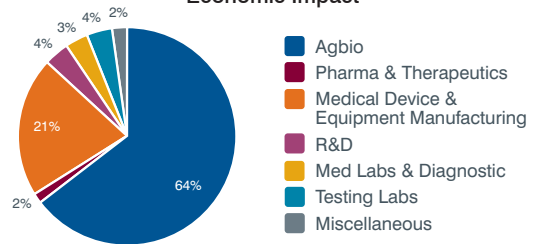


2007 Total Economic Impact



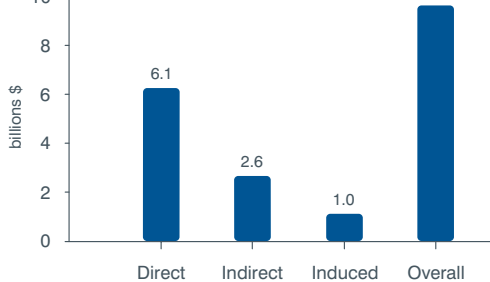
- Hospitals & Healthcare
- Commercial Bioscience Industry
- Medical Colleges

Commercial Bioscience Direct Economic Impact

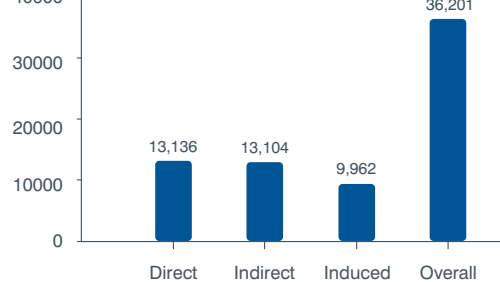


- Agbio
- Pharma & Therapeutics
- Medical Device & Equipment Manufacturing
- R&D
- Med Labs & Diagnostic
- Testing Labs
- Miscellaneous

Commercial Bioscience Economic Impact

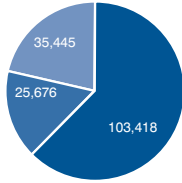


Commercial Bioscience Employment Impact

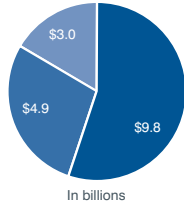


Central Ohio

2007 Total Employment Impact

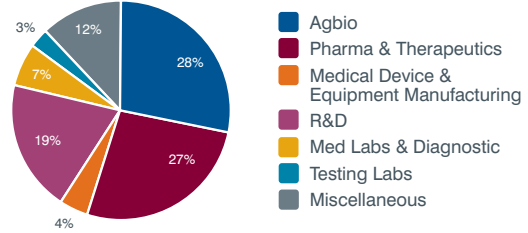


2007 Total Economic Impact



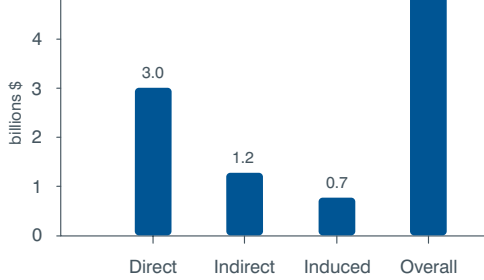
- Hospitals & Healthcare
- Commercial Bioscience Industry
- Medical Colleges

Commercial Bioscience Direct Economic Impact

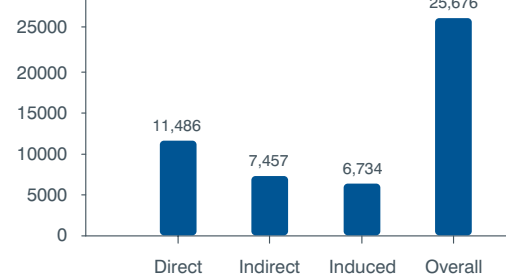


- Agbio
- Pharma & Therapeutics
- Medical Device & Equipment Manufacturing
- R&D
- Med Labs & Diagnostic
- Testing Labs
- Miscellaneous

Commercial Bioscience Economic Impact

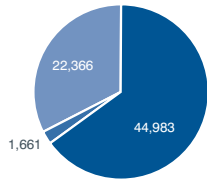


Commercial Bioscience Employment Impact

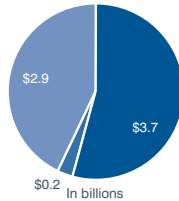


Southeast Ohio

2007 Total Employment Impact

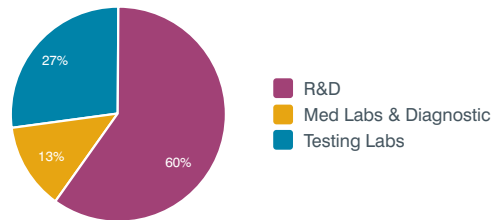


2007 Total Economic Impact



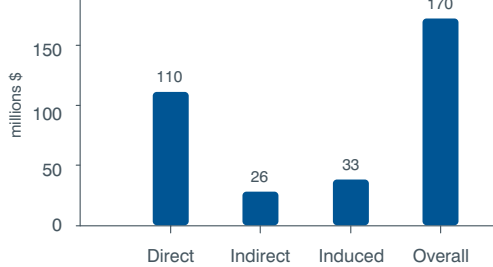
- Hospitals & Healthcare
- Commercial Bioscience Industry
- Medical Colleges

Commercial Bioscience Direct Economic Impact

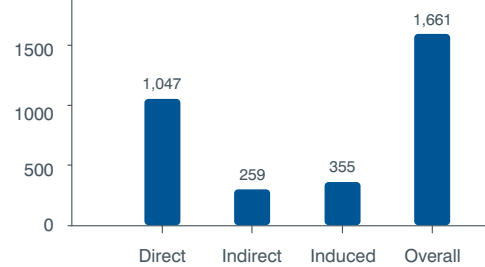


- R&D
- Med Labs & Diagnostic
- Testing Labs

Commercial Bioscience Economic Impact

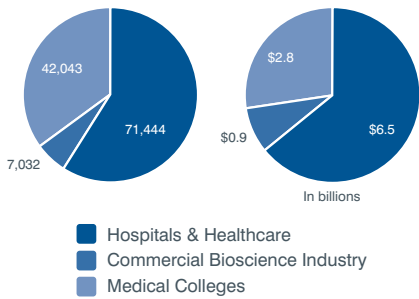


Commercial Bioscience Employment Impact

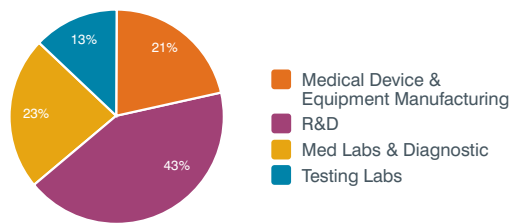


West Central Ohio

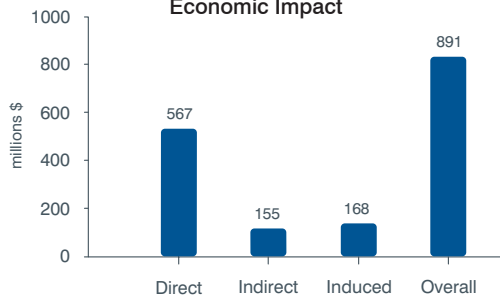
2007 Total Employment Impact 2007 Total Economic Impact



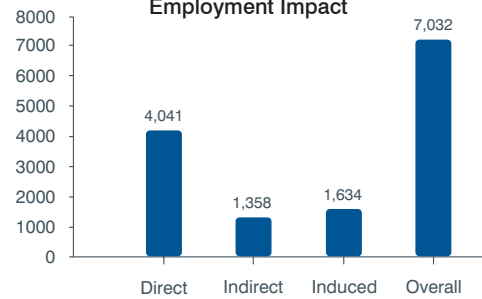
Commercial Bioscience Direct Economic Impact



Commercial Bioscience Economic Impact

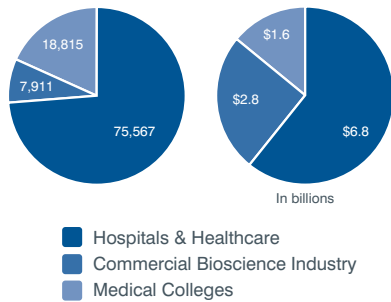


Commercial Bioscience Employment Impact

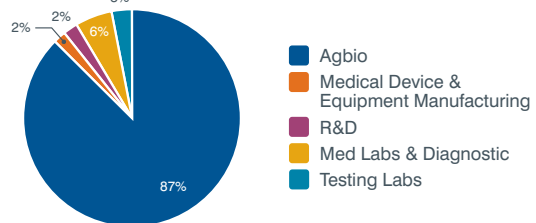


Northwest Ohio

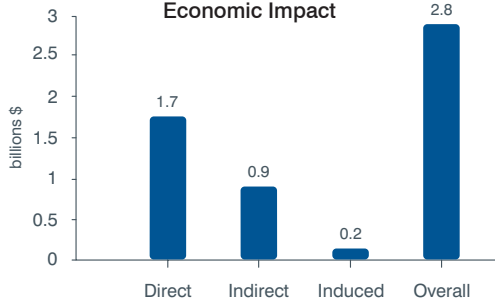
2007 Total Employment Impact 2007 Total Economic Impact



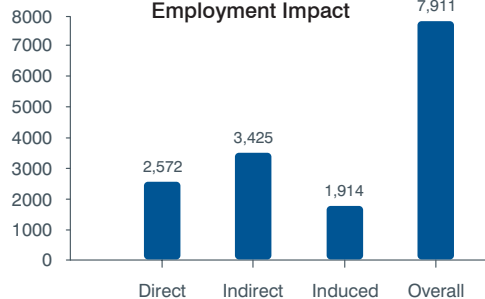
Commercial Bioscience Direct Economic Impact



Commercial Bioscience Economic Impact



Commercial Bioscience Employment Impact



Top Bioscience Employers by Subsector

Based on NAICS and Dun & Bradstreet (listed alphabetically)

Pharmaceutical/Therapeutics

Company Name	Region
Abbott Nutrition	Central
Affymetrix	NEO
Amresco	NE
Amylin Pharmaceuticals	SW
Astellas Pharma	Central
Barr Pharmaceuticals	SW
Ben Venue & Roxane (Boehringer Ingelheim)	NEO / Central
Cardinal Health	Central
Diagnostic Hybrids	SE
Eurand America	West Central
Forest Pharmaceuticals	SW
Givaudan US	SW
Meridian Bioscience	SW
Patheon Pharmaceuticals	SW
Procter & Gamble	SW

Medical Labs and Diagnostic Imaging

Company Name	Region
Alliance Imaging Inc	NE
Compunet Clinical Laboratories	West Central
LabOne (Quest Diagnostics)	SW
Laboratory Corp of America	Central
North American Science Assoc (NAMS)	NW
Orchid Cellmark	West Central
Pathology Laboratories Inc	NW
Shared PET Imaging LLC	NE
Spectrum Diagnostic Imaging	NE
University Radiology Assocs	SW
Zak Enterprises Ltd	NE

Medical Device and Equipment

Company Name	Region
3M Precision Optics	SW
Avalign (Nemcomed)	NW
Coltene Whaledent	NE
Covidien (Mallinckrodt)	SW
Ethicon Endo-Surgery (J&J)	SW
Ferno-Washington	SW
Invacare	NE
Leis Medical	West Central
Ohio Willow Wood	Central
Olympus (Gyrus Acmi)	NE
Philips Medical Systems	NE
STERIS Corp	NE
U S A Instruments (GE Healthcare)	NE
United States Endoscopy Group	NE
Yellow Springs Instruments (YSI)	W Central

Testing Labs

Company Name	Region
Acuren	West Central
Advanced Testing Laboratories	SW
Bionetics Corp	Central
CSA International	NE
Charles River Laboratories	NW
CSA America	NE
H C Nutting	SW
Hill Top Research	SW
Nestle USA	Central
Plastic Technologies	NW
Procter & Gamble	SW
Resource International	Central
SD Myers	NE
Springborn Smithers	NE
TestAmerica Laboratories	NE

Research and Development

Company Name	Region
Advanced Information Engg	West Central
Battelle Memorial Institute	Central
ChanTest	NE
Charles River Laboratories	NW
Cornerstone Research Group	WC
CTI - Clinical Trial Services	SW
EMD Chemicals	SW
Graftech	NE
Kendle International	SW
Kenmore Research Co (Swagelok)	NE
Nestle Product Technology	Central
Noveon	NE
Procter & Gamble	SW
Ricerca Biosciences	NE
Zin Technologies	NE

Miscellaneous

Company Name	Region
CAS (Chemical Abstracts Service)	Central
ChanXpress	NE
InVentiv Communications	Central
Magellan Life Science (Trek Diagnostics)	NE
MemberHealth	NE
Pharmaforce	Central
Prasco	SW
Prologue Research	Central
ScottCare	NE

Agricultural Biotechnology

Company Name	Region
Ampacet	Central
Archer Daniels Midland	NW
Aristech Chemical	SW
BASF	SW
Bunge North America Foundation	NW
Cargill	West Central
Givaudan Fragrances & Flavors Corp	SW
Hexion Specialty Chemicals	Central
Ineos Americas	NW
Lubrizon	NE
Lyondell Chemical Co	NE
Pcs Nitrogen	NW
Pioneer Hi-Bred International	NW
Scotts Miracle-Gro	Central
Struktol Co of America	NE

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Ohio Bioscience Growth Report

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