

# Missouri's advantages for the biomedical industry



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# Five reasons to locate a biomedical company in Missouri:

**1. Thriving industry:** Missouri has the right business environment for biomedical companies.

Missouri ranks 12<sup>th</sup> for employment in biopharmaceuticals according to the U.S. Cluster Mapping Project, which was conducted through Harvard Business School. [Go to page 3.](#)

**2. Abundant resources:** Companies are supported by research centers, incubator facilities and hospitals—and an abundance of funding sources—to bring their discoveries from the laboratory to the market.

Washington University in St. Louis ranked 7<sup>th</sup> for NIH funding in 2014 and was ranked the 6<sup>th</sup> best medical school for research in 2015 by *U.S. News and World Report*. [Go to page 8.](#)

**3. Quality workforce:** Missouri has the talent to sustain bioscience companies.

Missouri's bioscience industry in Missouri is comprised of nearly 3,500 companies employing nearly 50,000 Missourians (*U.S. Bureau of Labor Statistics, 2014*). [Go to page 15.](#)

**4. World-class education:** Missouri's top-ranked educational institutions draw unparalleled talent.

40 Missouri colleges and universities offer bachelor's degrees or higher in biological or biomedical sciences, including the University of Missouri, which is one of only a few universities in the U.S. with schools of medicine, agriculture and veterinary medicine on one campus. [Go to page 16.](#)

**5. Solid infrastructure:** Missouri's top-ranked transportation network is a dependable delivery system for goods and services.

With its centralized Midwest location, Missouri lies at the heart of a vast transportation network with direct connections to domestic and foreign markets. [Go to page 20.](#)



# Missouri has long been recognized for having the right business environment for biomedical companies.

The [U.S. Cluster Mapping Project](#) ranked Missouri 12<sup>th</sup> for employment in biopharmaceuticals. The project, which was conducted through Harvard Business School, also ranked St. Louis' biopharmaceutical cluster as the 13<sup>th</sup> largest in the nation and Kansas City's as the 15<sup>th</sup> largest, ahead of such areas as Cleveland, Minneapolis and Dallas.

Missouri is in the top 10 states in the U.S. for pro-business rankings:

- Top 10 for low property tax and corporate income tax indices (*Tax Foundation, 2015*)
- Top 10 Pro-Business State for five consecutive years (*Pollina Corporate, 2014*)
- Top 10 for regulatory climate (*Forbes, 2014*)

"The favorable business climate, quality workforce, and the close proximity to major pharmaceutical companies in the area were key factors in making the move to Missouri. With a new research center in St. Charles, we will be able to accommodate more clients and compete in the global market."

*Mohammed Bouhajib, VP Bioanalytical Operations, Pharma Medica Research*

## Recent biomedical projects in Missouri

### 2014



[Adarza BioSystems](#) (St. Louis), a life-science startup located in the BioGenerator, is partnering with SunEdison's Semiconductor business to establish an immunoassay consumable manufacturing facility at SunEdison's St. Peters office. Adarza's immunoassay technology can identify proteins and genetic markers in medical samples such as blood, which can help with cancer diagnostics and allergy testing, among other applications.



[BioPharma Services](#) (Columbia), a Canadian CRO, recently announced plans to expand its Clinical Operations into the U.S. by establishing a new 48-bed Phase I Clinical Facility in Columbia.



[Catalent Pharma Solutions](#) (Kansas City), a pharmaceutical firm that provides a wide range of fully integrated support, announced plans to hire an additional 230 employees over the next five years.



[Northwest Medical Isotopes](#) (Columbia) announced plans to build a 50,000 square-foot radioisotope production facility at the University of Missouri's research park in Columbia. The project is expected to create 68 jobs.



[Pharma Tech Industries](#) (Union), a pharmaceutical manufacturer and packager, announced plans to expand its operations in Union, creating 20 jobs.





**SCD Probiotics** (HQ Kansas City) produces probiotics for nutritional supplements, cleaning supplies, lawn and garden products and pet products. The company announced plans to make a capital investment of \$3.4 million and add 40 jobs.

### 2013



**Mallinckrodt** (HQ St. Louis), a leading global provider of specialty pharmaceuticals, announced plans to invest \$2 million in its U.S. headquarters in Hazelwood, creating 150 jobs in the area as part of its spinoff from former parent company Covidien.



**Nanova Biomaterials, Inc.** (Columbia), an R&D company using nanotechnology to manufacture orthopedic and dental products, announced plans to expand its operations, making a \$1.5 million capital investment and creating 50 jobs.



**Pharma Medica Research, Inc.** (St. Charles) a contract research organization serving the pharmaceutical and biotechnology industry, announced plans to make a \$30.8 million capital investment and create 320 jobs at its first U.S. facility.

## Major biomedical companies



**ABC Labs** (HQ Columbia) is a full-service contract research and development company providing analytical and biological services to support the pharmaceutical, agricultural, animal health and chemical industries.



**bioMérieux Inc.** (St. Louis), a world leader in the field of in vitro diagnostics for over 45 years, operates in more than 150 countries through 39 subsidiaries and a large network of distributors.



**Cardinal Scale Manufacturing Company** (HQ Joplin) produces an extensive range of scales for all kinds of industries: medical, food service, truck and livestock.



**Cofactor Genomics** (HQ St. Louis) is a privately held biotechnology company founded in 2008 after the completion of the Human Genome project by Technology Development Scientists from Washington University's Genome Center in Saint Louis, MO. Cofactor Genomics is the market leader in RNA based products and services in the rapidly expanding functional genomics market. In 2014, Cofactor Genomics was awarded a grant by the National Institute of Mental Health (NIMH) to develop a standardized enrichment kit and define the normal reference profile for circular RNAs (circRNA) in the nervous system.





**Euticals** (Springfield) engages in the development, manufacture, and commercialization of pharmaceuticals. Its products include reagents and building blocks, regulatory starting materials, cGMP intermediates and active pharmaceutical ingredients.



**EMD Millipore** (St. Charles) provides life sciences research products and services, including drug testing for large pharmaceutical and biotech companies. The St. Charles location develops research-grade assays for measuring biomarkers in blood and serum that enable scientists to detect and diagnose diseases such as diabetes and cardiovascular ailments.



**Gallus Biopharmaceuticals** (HQ St. Louis), a manufacturer of biologic pharmaceuticals, purchased the former Centocor Biologics facility in St. Louis in 2011. The company was acquired by North Carolina-based DPx Holdings in 2014.



**GlaxoSmithKline** (St. Louis) manufactures TUMS and Oscal at their St. Louis facility.



**Immunophotonics** (Columbia) is a research-oriented company in the frontline of cancer vaccine research. The company is developing Laser-Assisted Immunotherapy, which is an in situ cancer vaccine (inCVAX), one of the most innovative and promising modalities for metastatic tumors to have emerged in the cancer research world.



**Labconco** (HQ Kansas City) is a manufacturer specializing in fume hoods, enclosures, evaporators and exhausters for use in laboratories.



**Lumara Health** (HQ St. Louis), formerly known as K-V Pharmaceutical, Lumara is a specialty branded pharmaceutical marketing company primarily focusing on women's healthcare.



**National Enzyme Company** (HQ Forsyth), the oldest enzyme company in North America, specializes in product formulation and patented, branded ingredients.



**Pfizer Inc.** (St. Louis), a multinational pharmaceutical corporation, has two locations in the St. Louis area that in recent years have played a significant role in bringing Celebrex (for arthritis), Inspra (for hypertension and congestive heart failure), and Genotropin and Somavert (both for hormone disorders) to patients. Pfizer's St. Louis labs are currently focused in the area of Biotherapeutics and Vaccines development.



**Reliv International Inc.** (HQ St. Louis) is a food science company that develops, manufactures and markets nutritional supplements.



**Sanofi-Aventis** (Kansas City and St. Louis), a Fortune 1,000 company, is one of the world's leading pharmaceutical companies specializing in seven major therapeutic areas: cardiovascular, thrombosis, oncology, metabolic diseases, central nervous system, internal medicine and vaccines.





**Sigma-Aldrich** (HQ St. Louis) produces chemical and biochemical products for scientific research, including genomic and proteomic research, biotechnology, pharmaceutical development, and diagnosis of disease. The company's "targeted knockout" rats—engineered with permanent, heritable gene mutations—have been cited by *The Scientist* magazine as a leading innovation. The company was acquired by Merck in 2014.



**Sinclair Research Center** (Columbia) is a biomedical research facility offering a full range of preclinical research services to the animal and human health industries.



**Stereotaxis, Inc.** (HQ St. Louis) designs, manufactures and markets cardiology instrument control systems for the treatment of arrhythmias and coronary artery disease.



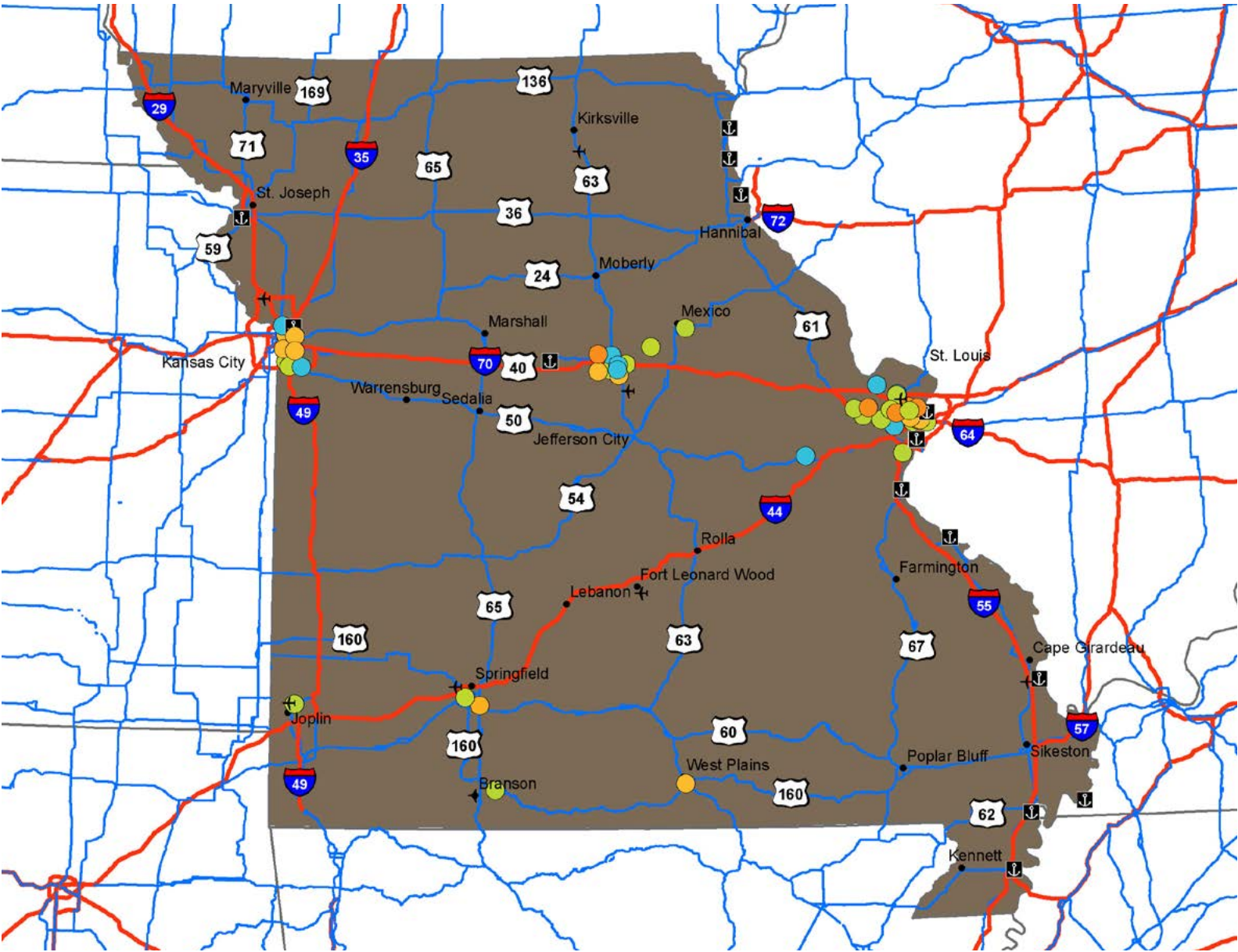
**TEVA Pharmaceuticals USA, Inc.** (Mexico) manufactures and markets generic pharmaceutical products creams, ointments, inhalants, solutions, suspensions and dosage forms, such as tablets and capsules, as well as injectable products such as vials, IV bags and prefilled syringes.



**Veran Medical Technologies** (HQ St. Louis) is a medical device company focused on non-invasive interventional oncology therapies. In 2008 the company relocated its headquarters to St. Louis to build relationships with the local medical community. They secured \$4.75 million from local venture capital firms and private financing to drive adoption of its IG4 delivery system for its minimally invasive biopsy and the ablation of cancer.

# Missouri's major biomedical companies and research facilities

- Recent projects
- Biomedical companies
- Research parks and incubators
- Research centers
- ✈ Port authority
- ✈ Major airport



# Companies are supported by research centers, incubator facilities and hospitals—and an abundance of funding sources—to bring their discoveries from the laboratory to the market.

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*The Jordan Valley Innovation Center (JVIC) in Springfield.*

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Washington University is home to some of the “hottest of the hot” scientific researchers on the planet according to a report from Science Watch, which determined the most influential scientists by analyzing citation data over the past 11 years to identify those who published the work with the highest impact. The four researchers from Washington University identified as the most influential in the report all study genomics.

The College of Veterinary Medicine at the University of Missouri places a strong emphasis in research on comparative animal models for human diseases. The University of Missouri is the only campus that houses a NIH Rat Resource Center, Swine Resource Center and one of four Mutant Mouse Resource Centers in the country.

## Research parks and incubators

[The Center for Emerging Technologies](#) (St. Louis) develops startup companies in biotechnology, biomedical engineering, advanced materials, and electronics. Stereotaxis became the first of the center’s companies to complete a public offering. In 2014, the Cambridge Innovation Center took over management of the Center for Emerging Technologies, creating their first location outside of Boston with plans to add 87,000 square-feet.

[The Cortex Innovation Community](#) (St. Louis) is a cutting edge biotech district located near Washington University in St. Louis, Saint Louis University, and Barnes-Jewish Hospital. Institutions within the district receive more than \$400 million in NIH funding annually.



**Helix Center** (St. Louis) is a small business incubator that provides startups in plant and life sciences with affordable office and laboratory space, access to expertise and access to facilities at the Bio-Research and Development Growth (BRDG) Park at the Donald Danforth Plant Science.

### University of Missouri

**Discovery Ridge** (Columbia) leverages the University of Missouri's resources in agriculture, health, veterinary medicine, bioengineering, nutrition, biology and environmental services.

**The Ellis Fischel Cancer Center** (Columbia) is the only academic member of the MD Anderson Cancer Center Certified Physicians Network.

**Innovative Technology Enterprises (ITE)** (St. Louis) helps convert innovative ideas into thriving businesses in the information technology and life science sectors. ITE offers state-of-the-art infrastructure, in-house mentoring, business development, and access to University faculty and students. In keeping with the University's mission, ITE fosters innovation to support economic development.

**Life Science Business Incubator at Monsanto Place** (Columbia) is home to more than 20 early stage companies, including 15 biomedical ventures at various stages of development of products that include therapeutics, diagnostics and devices. Leading biomedical clients residing at the incubator include Immunophotonics (in situ cancer vaccine), Tensive Controls (peptide drugs to reverse cachexia), and Eternogen (innovative dermal filler using gold nano-particle modified collagen).

**Missouri Research Park** (St. Louis) has more than 130 acres developed for high-tech and research facilities, housing 15 tenant companies with more than 2,000 employees.

### Biomedical research centers

**IDEXX Research Animal Diagnostic Laboratory (RADIL)** (Columbia) is located on the campus of the University of Missouri. The laboratory is one of the two largest research animal diagnostic laboratories in the U.S. and the largest at an academic institution.

**MRIGlobal** (Kansas City) has earned international recognition for its health research services supporting the pharmaceutical, biotechnology, veterinary and agrochemical industries worldwide. MRIGlobal was formerly known as the Midwest Research Institute.

**Missouri State University, Jordan Valley Innovation Center (JVIC)** (Springfield) is committed to the development and support of advanced biotechnology industries in Missouri. The Center for Biomedical and Life Sciences (CBLIS) and the Center for Applied Science and Engineering (CASE) assist companies in developing and accelerating technologies related to medical instruments, bioprocessing techniques and equipment, R&D for agribusiness and chem/bio sensors and systems.

Kansas City University of Medicine and Biosciences' **Center for Community and Clinical Research** is the first not-for-profit academic clinical research center for adults in Kansas City, Mo., strengthening the area's leadership in the field.

The Saint Louis University **Center for Vaccine Development** is a multi-disciplinary research facility for vaccines and biologics, and it is one of only eight NIH-funded vaccine research institutions. The Center conducted pivotal research on the H1N1 influenza vaccine, biodefense, respiratory syncytial virus (RSV), and tuberculosis vaccines.

"We chose Columbia, Missouri, as our preferred location of this state of the art facility due to my positive experience with the Columbia medical community and high technology environment at the University of Missouri and within the state."

*Renzo DiCarlo, CEO, BioPharma Services Inc*



**The Stowers Institute for Medical Research** (Kansas City) conducts basic research on genes and proteins to determine the causes, treatment and prevention of diseases.

### University of Missouri

**The Dalton Cardiovascular Research Center** (Columbia) focuses on such ailments as hypertension, cancer, cystic fibrosis and heart disease. Investigators hold primary academic appointments in the Schools of Medicine, Veterinary Medicine, Engineering and Arts and Science. Collaboration between scientists within the center and across campus is one of Dalton's greatest strengths.

**The International Institute for Nano and Molecular Medicine** (Columbia) aims to become the international leader in the reinvigorated field of boron neutron capture therapy (BNCT), a cell-selective binary radiation method for cancer, arthritis and evolving non-invasive surgical protocols.

**The Radiopharmaceutical Sciences Institute (RSI)** (Columbia) develops cancer-specific diagnostic and therapeutic radiopharmaceuticals through the design, formulation and study of novel radiolabeled biomolecular in vivo targeting agents.

**The MU Research Reactor (MURR)** (Columbia) specializes in the development of techniques for the diagnosis and cure of cancer and other diseases. It is the largest university operated and the only commercial scale research reactor in the country. MURR is one of only four research reactors in the world producing the radioactive isotope, technetium-99, that is used in about 50,000 medical studies daily in the U.S.

**The Center of Excellence in the Study of Dental and Musculoskeletal Tissues (CEMT)** (Kansas City) is a collaborative effort between the Schools of Dentistry, Medicine, Nursing and Computing and Engineering focused on dental and musculoskeletal health. CEMT conducts research to prevent and treat diseases of mineralized tissue, including teeth, cartilage, bone and muscle tissue. Research applications include biomaterials, medical devices, diagnostics, imaging and veterinary medicine.

### Washington University in St. Louis

**BioMed 21** is a research facility with seven interdisciplinary research centers dedicated to translating basic science discoveries into real-world clinical solutions, an approach called translational research. The facility was developed by Washington University in St. Louis and BJC HealthCare.

**The Center for Gut Microbiome and Nutrition Research** aims to tackle the challenges of feeding the world's rapidly expanding population and improving global health by linking efforts to develop more nutritious foods with discoveries gleaned from the gut microbiome.

**The Genome Institute** was one of the first three sites to begin full-scale human sequencing as part of the Human Genome project. Scientists there were the first in the world to decode the complete DNA sequence of a cancer patient.

**Molecular Imaging Center** fosters collaborations on advanced imaging projects between scientists from many different specialties. Initiatives at the center include efforts to track the spread of gene therapy for cancer and monitoring key genes in tumors. While the center's core focus is cancer, it supports collaborative imaging efforts in a wide variety of fields, including immunology, neuroscience and cardiovascular disease.



**Siteman Cancer Center** is an international leader in cancer treatment, research, prevention, education and community outreach at Barnes Jewish Hospital and Washington University School of Medicine. It is the only cancer center in Missouri to hold the prestigious Comprehensive Cancer Center designation from the National Cancer Institute.

**St. Louis Institute of Nanomedicine Working Group** focuses on the development and evaluation of new nanotechnologies for health care, commercialization testing and education. A collaborative effort between Washington University in St. Louis, Saint Louis University, the University of Missouri-St. Louis and St. Louis Community College, the Nanomedicine Working Group has received a grant from the Missouri Life Sciences Research Fund for four pilot projects per year using nanotechnology for the treatment of human disease.

Major hospitals in Missouri include:

Barnes Jewish Hospital (BJC) in St. Louis, nationally ranked in 13 specialties (*U.S. News & World Report, 2014*).

St. Luke's Hospital in Kansas City, nationally ranked in three specialties (*U.S. News & World Report, 2014*).

St. Louis Children's Hospital, nationally ranked in 10 specialties (*U.S. News & World Report, 2014*).

Children's Mercy Hospital in Kansas City, nationally ranked in nine specialties (*U.S. News & World Report, 2014*).



## Access to capital

In 2014, the number of venture capital deals reached a 14-year high in Missouri according to the MoneyTree report, put out by PricewaterhouseCoopers.

### Angel networks

**Arch Angels** (St. Louis) are a part of the region's seed to later stage equity capital continuum, targeting an investment range that is generally underserved by institutional venture capital firms.

**Billiken Angels** (St. Louis) provides capital to firms in all industries and at all stages, not just start-ups. To be considered, however, the firm or start-up must be owned by current or former St. Louis University students, faculty, or staff, or firms using intellectual property licensed from Saint Louis University.

**Centennial Investors Angel Investor Network** (Columbia) is a network of accredited investors devoted to funding technology-based start-up and early stage companies.

**Prosper Angel Network** (St. Louis) is a new initiative taking aim at closing the gender gap among entrepreneurs.

**Show-Me Angels** (Lee's Summit) is a membership organization of accredited investors committed to investing in early-stage companies in the Kansas City region.

St. Joseph Angel Capital Group, an affiliate of Mid-America Angel Investors, provides early stage funding to new and emerging businesses.

### Missouri venture capital funds and resources

**Advantage Capital Partners** (St. Louis) provides equity and debt capital, along with value-added counsel and other support, to operating businesses that have the potential for excellent investor returns as well as significant community impact.

**Arch Grants** (St. Louis) offers startups funding in the form of grants and supports the startups as they remain or transition to downtown St. Louis.

**Ascension Health Ventures** (St. Louis) is a strategic healthcare venture fund focused on the medical device, technology and service sectors with \$325 million under management. AHV is a strategic investor that adds value to portfolio companies by sharing solutions across its network of partners.

**BioGenerator** (St. Louis) is a privately funded, not-for-profit organization that works with researchers, inventors, and entrepreneurs to build successful, sustainable life science companies. The BioGenerator provides assistance—including pre-seed and seed investments, access to no-cost shared labs and equipment and management support—at the very earliest stages of new company formation.

**BioSTL** (evolved from the Coalition for Plant and Life Sciences) is a privately funded, not-for-profit organization that works with researchers, inventors and entrepreneurs to build successful, sustainable life science companies. The BioGenerator provides assistance at the very earliest stages of new company formation, including pre-seed and seed investments, access to no-cost shared labs and equipment, and management support.

**Bush O'Donnell Capital Partners** (St. Louis) invests in companies that have recurring annual revenues of \$5 million or more. It does not invest in start-ups, turnaround situations or companies with project-based revenues.

**Capital for Business, Inc.** (St. Louis) targets leading companies in niche markets that share the following characteristics: significant and defensible market positions, differentiated products and services, scalable business platforms, and consistent financial performance. CFB targets investments arising from management buyouts, leveraged buyouts, recapitalizations, corporate divestitures, growth financings, and going-private transactions.

**CC Capital Advisors** (Kansas City) is an independent investment-banking firm that provides services to middle-market companies, both public and private. Services include consultation of mergers and acquisitions, capital sourcing and corporate financial and strategic planning.

**Cultivation Capital** (St. Louis) announced the launch of its Health and Life Sciences fund in 2013. The fund is dedicated to investing in healthcare information technology and related mobile health platforms, medical devices, compound and drug discovery and plant/seed or biosciences technology. Cultivation Capital was recognized for being among the nation's most active seed investors in 2015.

**The eFactory** (Springfield) business incubator at Missouri State University supports startups and early stage companies in several targeted industries with a variety of resources, including early stage seed capital.

**Helix Fund** (St. Louis) supports entrepreneurship in the plant and life science sector by providing early stage capital and other financial support for advancing the commercialization of technology and innovation.

**Lewis & Clark Ventures** (St. Louis) is a venture capital firm focused on Series A funding for high growth companies in Life Sciences, Technology, Healthcare and other sectors.

**Nidus Partners** (St. Louis) provides seed funding, entrepreneurial experience and market input to advance early technology towards commercialization. It is a unique collaboration between experienced entrepreneurs and strategic corporations for the purpose of identifying and commercializing technologies impacting the energy market.

**Oakwood Medical Investors** (St. Louis) is a life sciences venture capital fund formed to invest in development-stage medical device, biopharmaceutical and healthcare service companies.

**Prolog Ventures** (St. Louis) specializes in early-stage life science and animal health companies.

**RiverVest Venture Partners** (St. Louis) invests in medical device and biopharmaceutical industries, as well as later-stage life science businesses. RiverVest had the highest number of portfolio exits among venture firms that invest in medical devices over the past two years according to a report from Medical Device and Diagnostic Industry, which ranked RiverVest as one of 15 agents of change in the medical technology industry.

**Stifel, Nicolaus & Company** (St. Louis) is a co-general partner of Vectis II, a national life sciences venture capital and private equity fund, co-headquartered in St. Louis and in Boston with its partner, Brooke Private Equity Advisors.

**Thompson Street Capital Partners** (St. Louis) is a private equity firm that invests in profitable middle-market companies headquartered in North America.

**Tradebot Ventures** (Kansas City) invests in technology-based companies located in the Kansas City region.

**Triathlon Medical Ventures** (St. Louis) is a Midwest-based venture capital firm that invests exclusively in the life sciences, providing equity capital to early and expansion stage companies in biomedical technology that address significant human healthcare needs.



Vectis Life Sciences Fund I (St. Louis) is a \$81.5 million fund-of-funds that began making investments in medical science venture capital funds in 2005. Fund II is a \$70 million fund-of-funds, but it also invests directly into companies.

## State funding resources

[Missouri Technology Corporation \(MTC\)](#) was established by the Missouri Legislature in 1994 as a private not-for-profit charged with attracting research funding and technology companies to Missouri. MTC has various funding and grant programs aimed at growing the state's bioscience sector, including the Missouri IDEA (Innovation, Development, and Entrepreneurship Advancement) Funds. The IDEA Funds support the transfer of science and technology into job creation and provide financing to eligible businesses through four stages of growth: pre-seed capital stage financing, seed capital stage financing, venture capital stage financing, and expansion stage debt.

[Life Sciences Research Trust Fund](#) was established in 2007 to enhance and transform research into commercial life science technology. The fund's focuses include agriculture, animal science, plant science, medical devices, biomaterials and composite research, diagnostics, clinical imaging, information technology related to human health, and nanotechnology related to drug development and delivery.

## Investment capital conferences

[Invest Midwest](#) facilitates investment in the region's top life science, technology and alternative energy companies. This annual conference attracts more than 300 attendees and has helped generate more than \$1 billion in investment capital over the past 15 years.

[Missouri Technology Expo](#) (Columbia) provides a forum for researchers, entrepreneurs, investors and business development professionals to interact. The expo brings together ready-to-license technology from institutions across the state, leading state speakers and a pitch competition with prizes.

"Missouri provides the right environment and opportunities for a DNA sequencing, analysis and design company to grow. As a young company, Missouri's business-friendly climate and diverse resources have played a key role in helping us compete in a global market. We're excited to be located in the Cortex district of St. Louis, a place we perceive as the heart of biotech in the Midwest."

*Jarret Glasscock, CEO, Cofactor Genomics*



# Missouri has the right workforce to sustain bioscience companies.

Code	Occupation title	Missouri employment	Missouri median hourly wage	Missouri annual mean wage	U.S. median hourly wage	U.S. annual mean wage
00-0000	All Occupations	2,673,640	\$15.76	\$42,790	\$17.09	\$47,230
17-2031	Biomedical Engineers	60			\$41.81	\$91,760
17-2041	Chemical Engineers	580	\$42.23	\$89,600	\$46.60	\$103,590
19-0000	Life, Physical, and Social Science Occupations	15,880	\$26.41	\$62,260	\$29.55	\$70,070
19-1021	Biochemists and Biophysicists	1,160	\$37.60	\$85,820	\$40.84	\$91,960
19-1029	Biological Scientists, All Other	330	\$33.45	\$69,520	\$35.92	\$77,920
19-4021	Biological Technicians	760	\$19.31	\$40,570	\$19.85	\$44,610
19-4031	Chemical Technicians	870	\$19.54	\$45,940	\$21.24	\$47,390
29-2011	Medical and Clinical Laboratory Technologists	3,040	\$27.05	\$55,730	\$28.57	\$60,560
29-2012	Medical and Clinical Laboratory Technicians	4,060	\$16.42	\$39,080	\$18.45	\$40,750
49-9062	Medical Equipment Repairers	1,340	\$19.23	\$43,900	\$21.95	\$48,540
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	650	\$19.33	\$40,600	\$18.55	\$41,150
51-9082	Medical Appliance Technicians	160	\$20.84	\$43,230	\$17.11	\$39,000

Source: BLS, May 2014

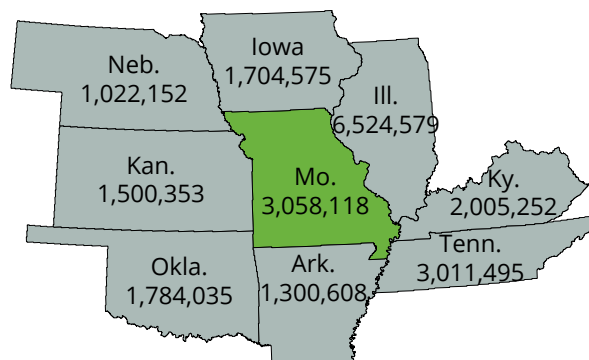
The Bioscience Industry in Missouri is comprised of nearly 3,500 companies employing nearly 50,000 Missourians (*U.S. Bureau of Labor Statistics, 2014*).

88.7 percent of Missouri's population has attained a high school diploma or higher, exceeding the national average of 86.6 percent (*American Community Survey, 2013*).

Over one million Missourians hold a Bachelor's degree or higher (*American Community Survey, 2013*).

## Workforce, all industries

Bureau of Labor Statistics, 2014



# Missouri's top-ranked educational institutions draw unparalleled talent.

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*A.T. Still University's School of Dentistry in Kirksville*

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The University of Missouri is one of only a few universities in the United States with schools of medicine, agriculture and veterinary medicine on one campus.

40 Missouri colleges and universities offer bachelor's degrees or higher in Biological or Biomedical Sciences.

In 2013, 95,458 post-secondary degrees/certificates were awarded in the state. Of those, 40,963 were Bachelor's degrees, 20,577 were Master's degrees and 4,682 were Doctor's degrees.

[The Enstitute](#), an innovative apprenticeship program that began in New York in 2012, recently announced plans to expand to St. Louis. The Enstitute's apprenticeships place 18- to 24-year-olds at high-tech companies or nonprofit institutions for one or two years. The St. Louis Enstitute will be the first to offer life-sciences apprenticeships.

The School of Medicine at Washington University in St. Louis is continually ranked among the top in the country by U.S. News and World Report, and the University of Missouri-Kansas City School of Medicine was named among the region's top family medicine residency training programs by [Doximity](#) and [U.S. News and World Report](#) in 2015.

"Missouri has a portfolio of medical science companies and a growing talent pool, providing Pharma Tech Industries with the resources it needs to grow and thrive."

*Tony Mitchell, President and CEO, Pharma Tech Industries*





## Missouri medical schools

### DO-PhD programs

[A.T. Still University](#) (Kirksville), founded in 1892, is the birthplace of osteopathic medicine and the oldest osteopathic institution in the world. Current enrollment on the Kirksville campus is 712 DO-PhD students.

[Kansas City University of Medicine and Biosciences](#) is home to the oldest medical school in Kansas City and the largest in Missouri. Since 1916, the University has awarded the Doctor of Osteopathic Medicine degree to more than 7,000 graduates. Currently, 1,038 DO-PhD students are enrolled in the program. In 2015, the school announced plans to open a campus in Joplin, enrolling up to 150 students per class. The move will potentially turn the Missouri university into one of the largest medical schools in the nation.

### MD-PhD programs

[Saint Louis University School of Medicine \(SLU SOM\)](#), established in 1836, is a private, American Allopathic Medical School. The school has the distinction of awarding the first MD degree west of the Mississippi River. The University's \$82 million Edward A. Doisy Research Center supports research in five key areas: cancer and molecular biology; liver disease; cardiovascular disease; neurosciences and aging; and vaccine development. The school currently has an enrollment of 709 MD-PhD students.

[The University of Missouri School of Medicine](#) (Columbia) was the first publicly supported medical school west of the Mississippi River. MU's Department of Family and Community Medicine has been ranked in the top 10 by U.S. News & World Report for 21 consecutive years. 390 MD-PhD students are enrolled in the medical school.

[University of Missouri-Kansas City](#) offers an accelerated combined Bachelor/MD program based on a six-year curriculum, admitting students into the program directly from high school. Currently, 433 students are enrolled in the program.

[Washington University School of Medicine](#) in St. Louis ranked 7<sup>th</sup> for NIH funding in 2014 and 6<sup>th</sup> for research in 2015 (*U.S. News & World Report*). The school has been listed among the top ten medical schools since rankings were first published in 1987. Currently, over 485 MD-PhD students are enrolled.

## Missouri pharmacy schools

[St. Louis College of Pharmacy](#) is the oldest college of pharmacy west of the Mississippi River. The school's sole program is the Doctorate of Pharmacy. Enrollment is currently around 723 students.

[University of Missouri-Kansas City](#) offers Doctorates of Pharmacy, Pharmacology & Toxicology and Pharmaceutical Sciences. The school currently has 424 PhD students enrolled.

## Missouri dental schools

[A.T. Still University's School of Dentistry](#) welcomed its first class of students in 2013. Students will complete their first two years of study on ATSU's Kirksville, Mo., campus. Third- and fourth-year clinical education is based in St. Louis, which provides an adequate population base of patients in need of dental services. At least half of the fourth-year clinical experiences are distributed in community health centers (CHCs) and other safety net clinics in Missouri and the Midwest. The program currently has 76 students enrolled.

[University of Missouri-Kansas City School of Dentistry](#) originated from the Kansas City Dental College established in 1881. Currently over 475 DDS/DMD students are enrolled.

## Other notable biomedical training programs

[The Advanced Technology Center \(ATC\)](#) (Mexico) is a cooperative effort among the City of Mexico, Linn State Technical College, Moberly Area Community College and the University of Missouri Outreach and Extension. ATC offers five degree programs, including a Practical Nursing program, a Certified Nursing Assistant (CNA) program and a Medical Laboratory Technician program.

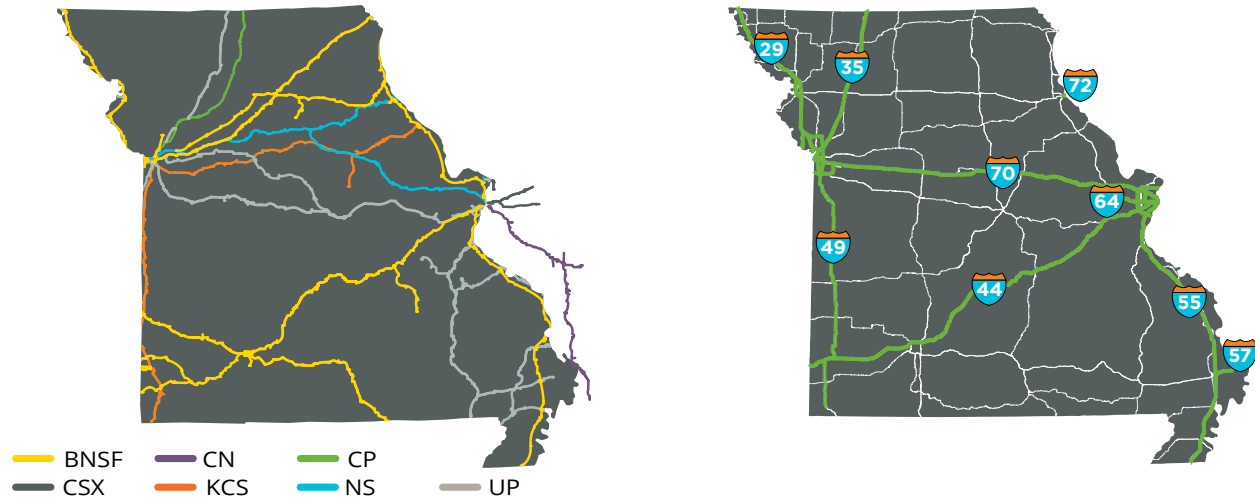
[The Project Lead the Way Biomedical Sciences](#) is an integrated high school program that introduces Missouri students to the numerous medical fields. PLTW Biomedical Sciences augments existing high school science and math college preparatory programs to establish a solid background in biomedical science. There are over 40 high school PLTW Biomedical Sciences programs running in Missouri high schools. The Missouri University of Science & Technology in Rolla is one of 52 colleges and universities in the U.S. that offer PLTW training, and one of only 15 that provide PLTW training in biological science.

## Biomedical degrees granted in 2013

	Associate's degrees	Bachelor's degrees	Master's degrees	Doctor's degrees	Total
Biochemistry, Biophysics and Molecular Biology	0	169	21	12	202
Biological and Biomedical Sciences, Other	0	71	13	0	84
Biology/Biological Sciences, General	12	1,632	119	20	1,783
Biomedical Sciences, General	0	45	33	0	78
Cell/Cellular Biology and Anatomical Sciences	0	45	24	18	87
Microbiological Sciences and Immunology	0	0	0	42	42
Dentistry	0	0	0	174	174
Medicine	0	0	0	490	490
Osteopathic Medicine	0	0	0	498	498
Clinical/Medical Laboratory Science/Research and Allied Professions	31	47	0	0	78
Medical Clinical Sciences	0	0	23	0	23
Pharmacy, Pharmaceutical Sciences, and Administration	0	7	0	298	305
Neurobiology and Neurosciences	0	34	1	16	51
Total	43	2,050	234	1,568	3,895

Source: National Center for Education Statistics, 2013

# Missouri's top-ranked transportation network is a dependable delivery system for goods and services.



## Rail

Missouri is one of the few states that can provide rail access to both east and west coasts. The Show-Me state also provides efficient, low-cost shipping across the country via all Class I carriers: Burlington Northern Santa Fe (BNSF), Kansas City Southern (KCS), Norfolk Southern (NS), Union Pacific (UP), CSX, Canadian National Railway (CN) and Canadian Pacific (CP).

Missouri is ranked fourth in tons and third in rail carloads carried by state (*Source: Association of American Railroads*).

Two of the largest U.S. rail terminals are located in Kansas City and St. Louis, linking nearly 4,000 miles of track throughout the state.

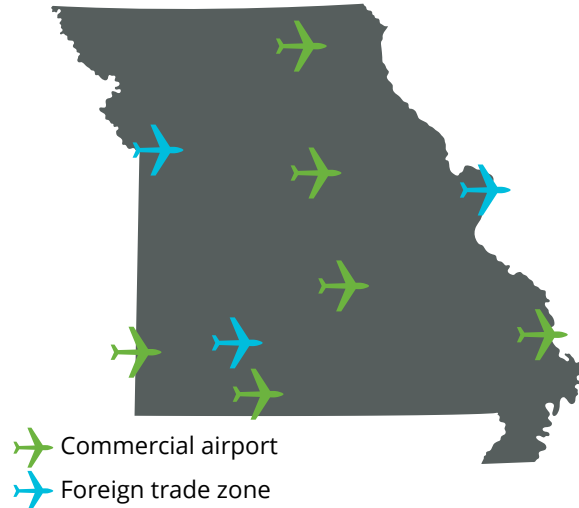
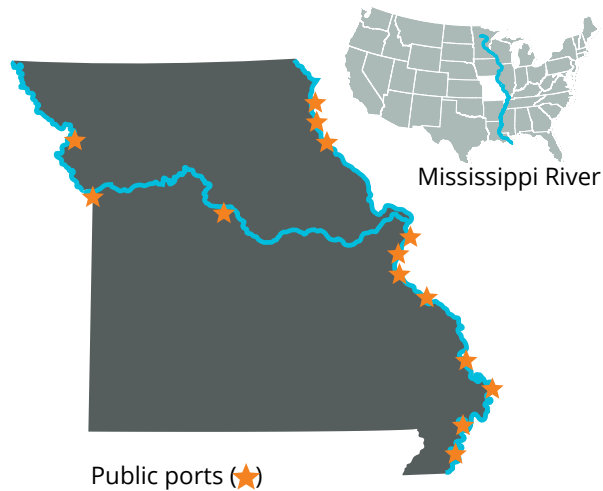
The CenterPoint KCS Intermodal center includes a 1,000 acre industrial park adjacent to the newly opened Kansas City Southern Intermodal Facility. With infrastructure in place, these sites are build-ready for facilities up to 1 million square feet. KCS offers direct rail service to points along their north/south network in the U.S. and Mexico, including the natural deepwater Port of Lazaro Cardenas, Mexico.

## Roads

Missouri has one of the least congested transportation networks in the United States and the 6<sup>th</sup> largest public road and highway system in the nation (*Source: Federal Highway Administration, 2013*).

Major interstates include I-64, I-44, I-70, I-55, I-35, I-49 and I-29. I-70, which bisects Missouri, is over 2,000 miles long and passes through 10 states. I-29 and I-35 are located within the NAFTA corridor, providing easy access to Canada and Mexico.

There are more than 110,000 commercial trailers registered in Missouri (*Source: Bureau of Transportation Statistics, 2011*).



## Waterways

Missouri is ranked 10th for inland waterway mileage (1,000 miles), moving an average of \$4.1 billion in cargo annually (*Source for mileage: Bureau of Transportation Statistics, cargo: Missouri Port Authorities*).

29 industrial centers, with a combined population of 90 million, can be reached from St. Louis by barge. St. Louis is the northern-most point on the Mississippi River that normally remains ice-free and open throughout the year. The city is also the location of the southern-most lock and dam on the Mississippi (*Source: Missouri Port Authorities*).

## Airports

Missouri travelers can reach most cities in the United States and Canada in less than three hours by air.

The airport system in Missouri consists of approximately 130 public airports, two of which support international traffic: Lambert-St. Louis International and Kansas City International.

Springfield, Branson, Joplin, Columbia, Cape Girardeau, Kirksville and Waynesville (Fort Leonard Wood) also have commercial service.

Missouri has three U.S. Customs Ports of Entry located in Kansas City, Springfield, and St. Louis.

## Foreign Trade Zones

Missouri has three foreign trade zones in Kansas City, St. Louis, and Springfield.

The FTZ at Lambert-St. Louis International Airport was recently expanded to include all of St. Louis and St. Louis County under the Alternative Site Framework. The airport has over 600 acres of land for development on the airfield.

Kansas City ranks first in the country in FTZ space, with five manufacturing zones (123.4 acres), nine general purpose FTZ sites, over 8 million square feet of active FTZ space, and 13,000+ acres of inactive FTZ space available for storage or processing merchandise.