



**A Labor Analysis of the Life Sciences Industry
in the Kansas City Region**

FEBRUARY 2017



RISING

OUR SHARED VISION
FOR REGIONAL PROSPERITY



This labor analysis was produced by the Mid-America Regional Council in support of KC Rising, a business-led initiative to strengthen the regional economy with focused attention on three economic drivers: trade, innovation and human capital.

The Kansas City Area Life Sciences Institute, Inc. (KCALSII) served as the industry leader and co-convenor to recruit industry participation in the Life Sciences Talent-to-Industry Exchange. KCALSII is a nonprofit organization that strives to advance life sciences in the Kansas City region through research, commercialization and workforce development.

Funding for the labor analysis was provided by the Civic Council of Greater Kansas City and a U.S. Economic Development Administration grant awarded to MARC.

ABOUT TALENT-TO-INDUSTRY EXCHANGES

The Talent-to-Industry Exchange (TIE) concept was introduced in 2016 as a way to improve the labor supply in key industry sectors, growing the human capital necessary to attract and retain companies in the Kansas City region.

This strategy was put forward as a KC Rising pilot project to address the alignment of the region's education pipeline with workforce needs in specific industries. Several elements were deemed critical to the success of the TIEs:

- They must be industry led.
- They must be regional and comprehensive in approach, covering the full K-20 education continuum.
- They must be data driven and action oriented.



With guidance from the KC Rising Human Capital Oversight Committee, project partners outlined a process for each industry-specific TIE that includes (1) a detailed economic and labor analysis; (2) an educational asset inventory; (3) business engagement through surveys and facilitated discussions; and (4) an action plan and timeline for implementation.

This report provides the economic and labor analysis for the first TIE, which focuses on life sciences industry in Greater Kansas City. It includes information from business engagement that took place in late 2016.



INDUSTRY LEADER

Kansas City Area Life Sciences Institute, Inc.

PARTICIPATING EDUCATION STAKEHOLDERS

Full Employment Council
PREP-KC
University of Kansas
University of Missouri-Kansas City
Workforce Partnership
University of Central Missouri
Metropolitan Community College
Kansas City, Kansas, Public Schools
William Jewell College

PARTICIPATING BUSINESSES

Facilitated Discussions:

CEVA Biomune
Bayer
Grafton
Catalent Pharma Solutions
Beckloff Associates
Labconco
Cerner
TEVA Neuroscience

Online Survey:

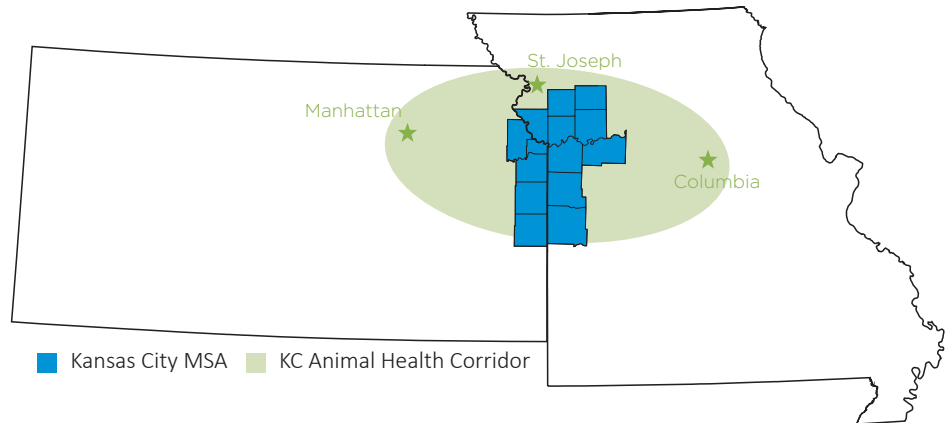
250 CEOs, human resource and line managers

LIFE SCIENCES IN GREATER KANSAS CITY

Life sciences are often defined as any branch of science that deals with living organisms, their life processes, and their interrelationships.

The Kansas City region is at the heart of the KC Animal Health Corridor, which stretches from Manhattan, Kansas, to Columbia, Missouri. Companies in this corridor account for more than half of total worldwide animal health, diagnostics and pet food sales.

Within the Kansas City Metropolitan Statistical Area (MSA), the life sciences sector has an annual economic impact of \$9.2 billion.



Sources: Jobs EQ (jobs and industries), KCALSI (economic impact)

LIFE SCIENCES INDUSTRIES

The life sciences economic sector includes companies engaged in research and development, manufacturing and bioinformatics. Except where noted, this report analyzes employment data in 23 industries* in the Kansas City MSA, some of which overlap with other industry sectors.



RESEARCH AND DEVELOPMENT
Testing Labs
Medical Labs
Biotechnology
Physical Sciences
Engineering Sciences



MANUFACTURING
Agricultural Chemicals
Animal Food
Medical Apparatus
Pharmaceuticals
Machinery
Equipment and Supplies



BIOINFORMATICS
Computer Programming
Computer Systems Design
Computer Facilities Management

*See full list by NAICS code in Appendix on page 23

TOP AREA LIFE SCIENCES EMPLOYERS



Bayer Animal Health

Shawnee, Kansas — 750 employees

Bayer Cropscience LP

Kansas City, Missouri — 550 employees

Boehringer Ingelheim Vetmedica, Inc.

St. Joseph, Missouri — 1,070 employees

Cerner Corporation

Multiple metro locations — 11,823 employees

Ceva Animal Health

Lenexa, Kansas — 478 employees

MRIGlobal

Kansas City, Missouri — 334 employees

PRA Health Sciences

Lenexa, Kansas — 600 employees

Quest Diagnostics, Inc.

Lenexa, Kansas — 600 employees

Quintiles

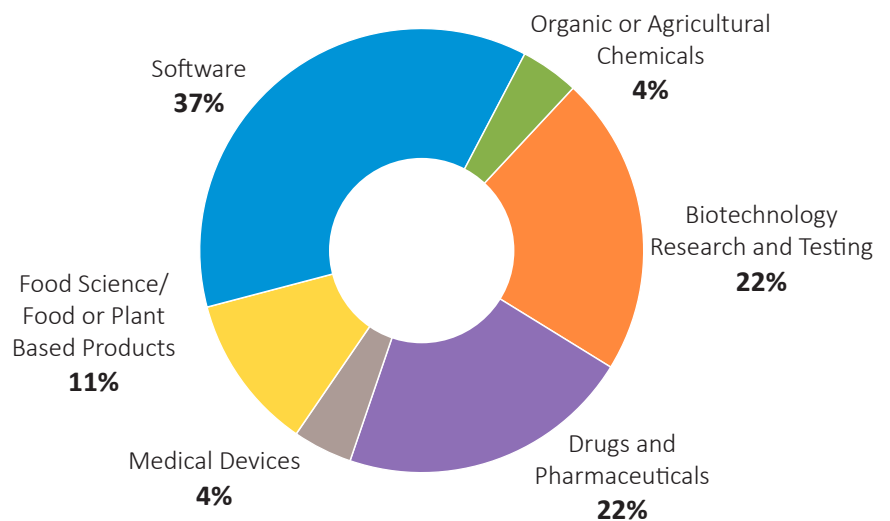
Overland Park, Kansas — 753 employees

TEVA Pharmaceuticals

Overland Park, Kansas — 378 employees

EMPLOYMENT BY INDUSTRY

Every three years, the Kansas City Area Life Sciences Institute (KCALSI) conducts a census of life sciences companies in the region. The 2015 census surveyed 249 companies in 26 counties in and around the Kansas City MSA. Employment by industry data from the census illustrates the strong technical nature of Kansas City's life sciences sector, with 37 percent of 28,269 employees in companies surveyed working in the software industry.



Source: KCALSI 2015 Life Science Industry Census

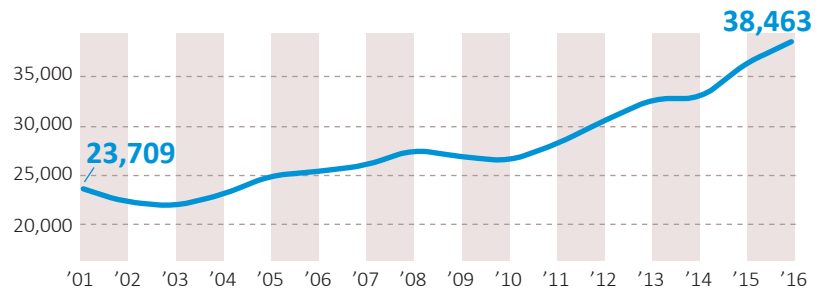
EMPLOYMENT TRENDS

The KCALSI census surveys individual firms. To evaluate longer-term trends requires using data for the 23 industries in which those firms operate. Most are part of the large professional, scientific and technical services sector.

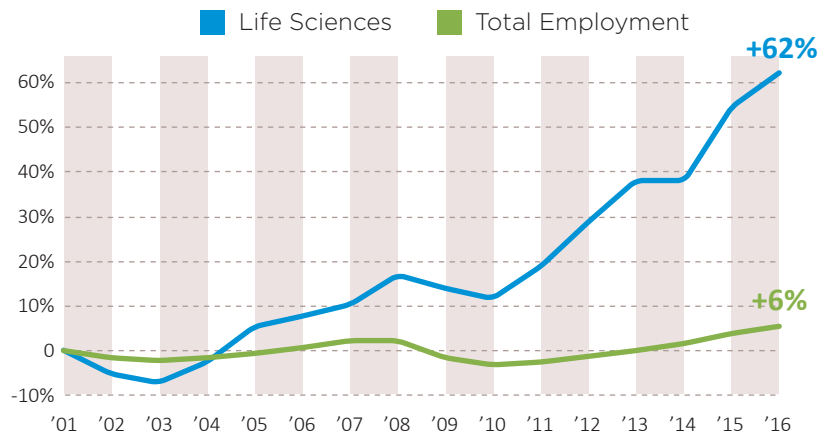
Life science industries in the Kansas City metropolitan area grew by nearly 15,000 jobs from 2001–2016, adding about 1,000 jobs per year to the area’s economy. As a result, these industries are growing 10 times faster than the metropolitan average. While life science industries were not immune to the impact of the Great Recession, they rebounded much more quickly and by 2011 had achieved their pre-recession employment peak — a feat that took three more years for the Kansas City area economy as a whole. About two-thirds of the growth in life science industries, or about 42 percent, has occurred since the recession.

This acceleration of the region’s employment growth in life science industries is readily apparent when compared to national trends for those same industries. Since 2001, U.S. employment in life sciences has grown about 2 percent per year, or 30 percent over the 2001-2016 period. Between 2001 and 2010, life sciences employment in the Kansas City area grew at a pace only a little faster than the U.S., but since 2010 has grown nearly twice as fast.

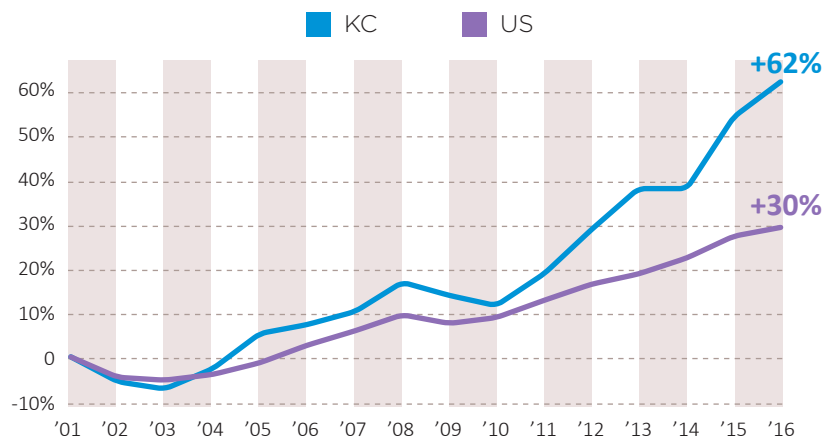
Life Science Employment | Kansas City Metro, 2001-2016



KC Employment Growth | Life Sciences vs. Total



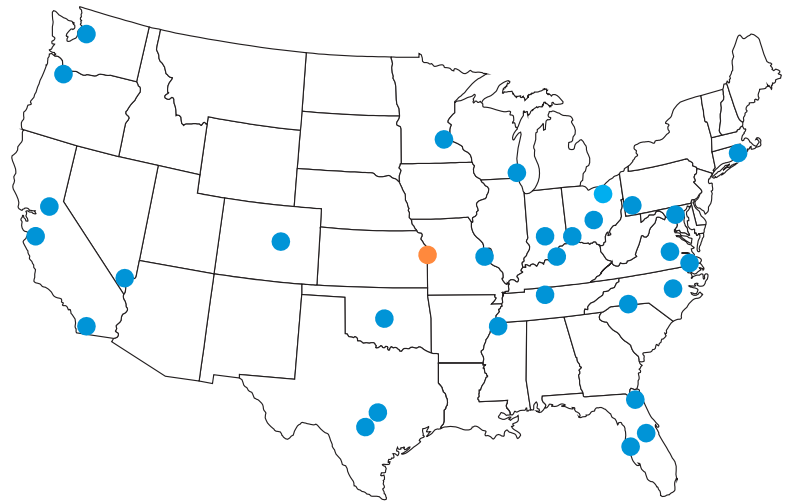
Life Sciences Employment Growth | KC vs. US



Source: Jobs EQ

SPECIALIZATION

The Location Quotient (LQ) formula helps identify industries where the Kansas City metro excels. To figure LQ, we compare the number of jobs in the industry to total jobs to calculate a percentage, both for a metro and for the nation. Then we divide the metro percentage by the national percentage. An LQ greater than one indicates an industry where the region has a specialty or high concentration of jobs, giving it a competitive edge. The tables below compare Kansas City to 30 peer metros.



LIFE SCIENCES LQ OVERALL

San Jose	3.71
San Diego.....	1.87
Austin	1.66
Raleigh.....	1.64
Baltimore.....	1.40
Indianapolis	1.39
Minneapolis.....	1.37
Denver	1.34
Kansas City	1.27
Seattle	1.17
Columbus	1.17
Pittsburgh	1.07
Providence.....	0.97
Tampa	0.95
Milwaukee	0.92
Cincinnati.....	0.92
Portland.....	0.88
St. Louis	0.87
Virginia Beach.....	0.82
Richmond	0.82
Cleveland.....	0.79
Charlotte.....	0.78
San Antonio	0.77
Sacramento	0.75
Memphis	0.73
Jacksonville.....	0.67
Louisville.....	0.63
Orlando	0.62
Nashville	0.55
Oklahoma City	0.53
Las Vegas	0.39

LIFE SCIENCES LQ BIOLOGY

San Diego.....	2.76
San Jose	2.61
Indianapolis	1.66
Minneapolis.....	1.60
Raleigh.....	1.33
Providence.....	1.27
Columbus	1.24
Pittsburgh	1.23
Memphis	1.15
Baltimore.....	1.10
Milwaukee	1.07
Denver	1.04
Cincinnati.....	1.01
San Antonio	1.00
Tampa	0.95
Portland.....	0.93
St. Louis	0.89
Austin	0.88
Kansas City	0.87
Seattle	0.78
Richmond	0.74
Sacramento	0.73
Charlotte.....	0.72
Cleveland.....	0.72
Virginia Beach.....	0.66
Orlando	0.56
Louisville.....	0.55
Oklahoma City	0.53
Jacksonville.....	0.46
Nashville	0.44
Las Vegas	0.42

LIFE SCIENCES LQ BIOINFORMATICS

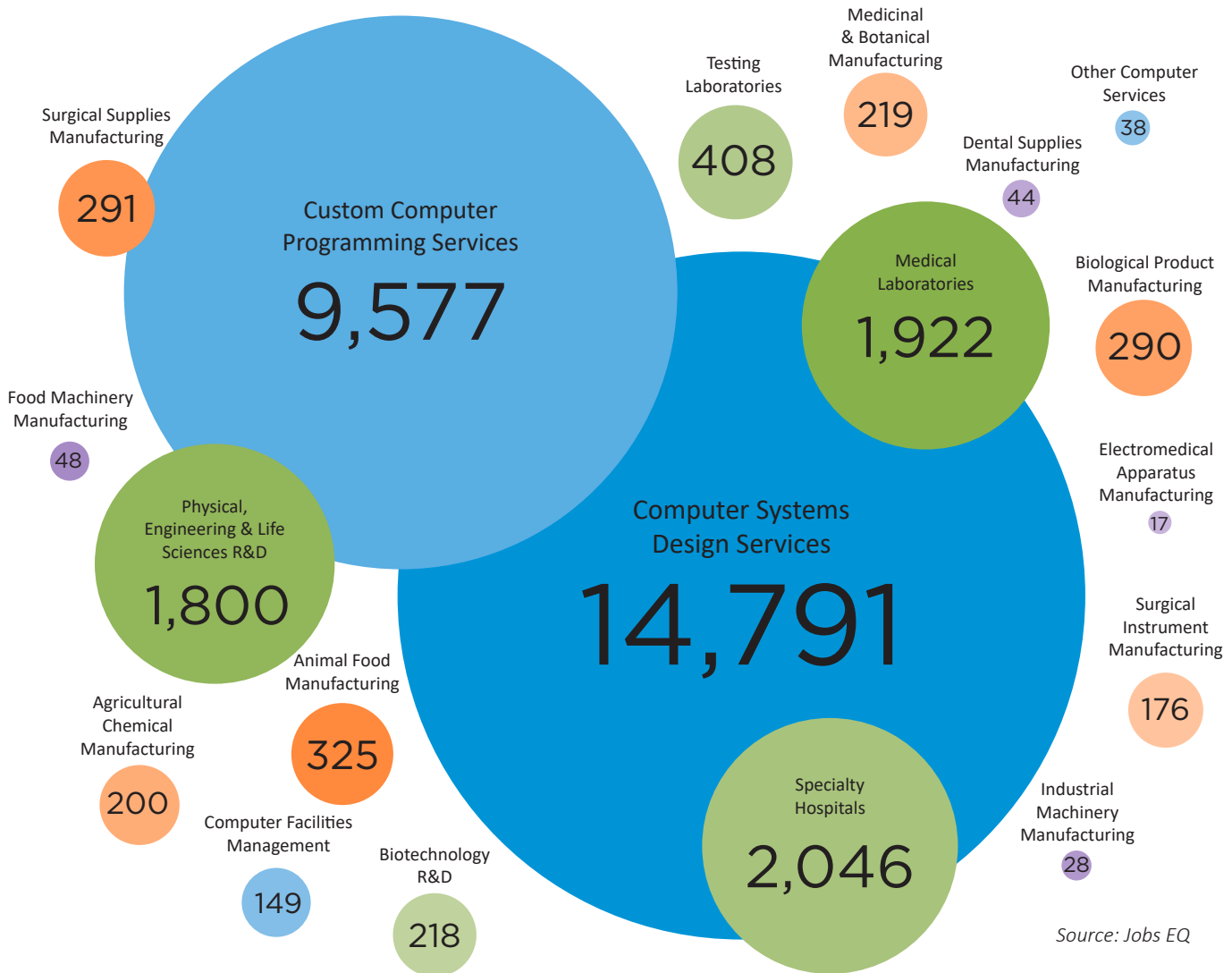
San Jose	4.71
Austin	2.43
Raleigh.....	1.94
Baltimore.....	1.68
Kansas City	1.64
Denver	1.63
Seattle	1.57
Minneapolis.....	1.14
Indianapolis	1.10
Columbus	1.08
San Diego.....	0.99
Virginia Beach.....	0.97
Tampa	0.95
Pittsburgh	0.90
Jacksonville.....	0.90
Richmond	0.89
Portland.....	0.87
Cleveland.....	0.86
Charlotte.....	0.84
St. Louis	0.84
Cincinnati.....	0.82
Sacramento	0.79
Milwaukee	0.77
Louisville.....	0.70
Orlando	0.69
Nashville	0.68
Providence.....	0.67
Oklahoma City	0.54
San Antonio	0.53
Las Vegas	0.39
Memphis	0.31

Note: The 30 peer metros are the 15 immediately above the Kansas City region in population and the 15 immediately below.

Source: Jobs EQ

JOB GROWTH BY INDUSTRY

The chart below shows projected 10-year employment demand for industries in the life sciences sector in the Kansas City MSA. Industries related to information technology are expected to have the highest growth, while life sciences manufacturing will not grow as fast.



The health of an industry's employment is often measured using growth demand, also called net new growth, which measures the net new jobs created in an industry over a given period of time. This is a useful measure, but it does not tell the whole story. Another important component of employment growth is replacement demand — the number of jobs available because workers retire or leave the industry. The numbers above show total demand (growth demand plus replacement).

This is an important figure for educational institutions because it captures the total demand from area businesses, not just the industries that happen to be growing. For example, employment in Kansas City's manufacturing industry overall (not just in life sciences) is expected to shrink by about 5,000 jobs over the next 10 years; however, replacement demand is forecast to add 17,000 jobs over the same time period, leaving a net demand of 12,000 positions to be filled. In other words, 12,000 people will still need training and education to start work in manufacturing.

FASTEST GROWING OCCUPATIONS BY CONCENTRATION

The employment forecast below is based on our historical trend, part of which includes the Great Recession. As a result, these demand numbers are expected to be conservative. Some of the fastest growth in life science manufacturing occupations over the next few years will occur in entry-level positions that require only high school or some college, while most fast-growing jobs in bioinformatics and research and development require at least a bachelor's degree. (Only the top 10 occupations by current life science industry employment are shown for each concentration.)

10-year Demand Forecast

Occupation	Current Jobs	Average Wage	Entry-Level Credential	Growth Demand	Replacement Demand	Total Demand
Top 10 in Research and Development						
Medical Scientists	318	\$104,300	Doctoral	+70	+103	+173
Computer Hardware Engineers	268	\$99,900	Bachelor	+126	+57	+184
Mechanical Engineers	222	\$77,800	Bachelor	+39	+76	+115
Chemists	217	\$68,100	Bachelor	+41	+51	+92
Biological Technicians	201	\$43,400	Bachelor	+33	+55	+87
Industrial Engineers	166	\$82,700	Bachelor	+37	+54	+92
Chemical Technicians	154	\$41,100	Associate	+31	+48	+79
Electrical Engineers	153	\$93,300	Bachelor	+29	+38	+68
Electronics Engineers	142	\$88,700	Bachelor	-1	+33	+32
Biochemists and Biophysicists	131	\$84,100	Doctoral	+31	+41	+71
Top 10 in Bioinformatics						
Software Developers, Applications	3,391	\$94,100	Bachelor	+1,501	+600	+2,101
Computer Systems Analysts	2,161	\$84,100	Bachelor	+937	+329	+1,267
Software Developers, Systems Software	1,836	\$95,600	Bachelor	+700	+274	+974
Computer Programmers	1,731	\$75,600	Bachelor	+378	+374	+752
Computer User Support Specialists	1,655	\$50,200	Some college	+556	+245	+801
Network & Computer Systems Admins.	910	\$76,000	Bachelor	+260	+134	+394
Computer Network Architects	525	\$95,400	Bachelor	+112	+72	+184
Computer Network Support Specialists	498	\$61,700	Associate	+70	+72	+142
Web Developers	407	\$58,900	Associate	+142	+78	+220
Computer Occupations, All Other	392	\$84,200	Bachelor	+71	+65	+136
Top 10 in Manufacturing						
Inspectors, Testers, Sorters, Weighers	225	\$42,800	High school	+23	+61	+84
Packaging and Filling Machine Operators	187	\$32,900	High school	+26	+67	+93
Mixing and Blending Machine Operators	175	\$38,000	High school	+11	+45	+56
Team Assemblers	150	\$43,300	High school	+45	+35	+80
First-Line Supervisors	148	\$57,300	High school	+5	+27	+32
Maintenance and Repair Workers	146	\$37,000	High school	+15	+39	+54
Computer and Office Machine Repairers	126	\$37,600	Some college	+23	+30	+54
Laborers and Goods Movers	119	\$28,700	< High school	+17	+38	+55
Chemical Plant and System Operators	98	\$67,600	High school	+5	+48	+53
Dental Laboratory Technicians	83	\$40,000	High school	+16	+22	+37

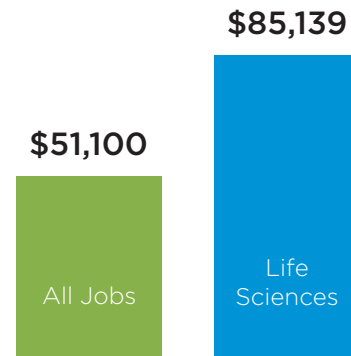
Source: Jobs EQ, MARC

WAGE ANALYSIS

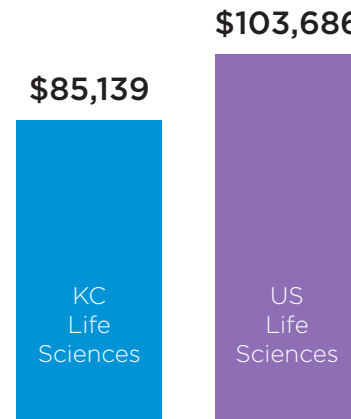
KC area life science jobs are high paying compared to all jobs in the MSA, but below average compared to the US and right in the middle of our 30 peer metros.

In each individual concentration — bioinformatics, manufacturing, and research and development — the Kansas City region ranks below the halfway mark, as shown on the following page. But since 64 percent of the region’s life sciences jobs are in the higher-paying bioinformatics field, Kansas City places 16th in average wages when all three concentrations are combined.

KC Average Annual Wages | All Jobs vs. Life Sciences

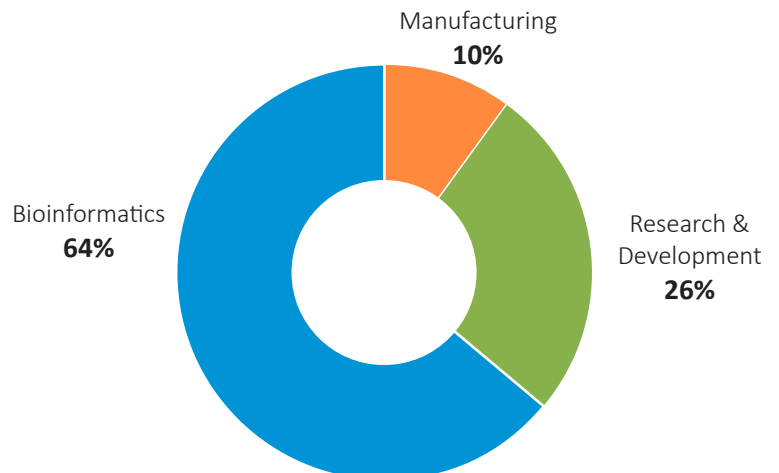


Average Annual Wages, Life Sciences | KC vs. US



Average Annual Wage LIFE SCIENCES	
San Jose	\$184,812
San Diego.....	\$143,988
Indianapolis	\$114,934
Sacramento	\$106,706
Minneapolis.....	\$104,706
▶ USA	\$103,686
Austin	\$103,621
Seattle	\$103,118
Raleigh.....	\$102,352
Baltimore.....	\$101,703
Denver	\$94,143
Portland.....	\$93,200
Providence.....	\$91,894
Columbus	\$91,523
Memphis	\$87,120
Milwaukee	\$85,773
▶ Kansas City	\$85,139
Orlando	\$84,930
Richmond	\$84,897
St. Louis	\$84,741
Pittsburgh	\$84,722
Virginia Beach.....	\$82,802
Charlotte.....	\$82,575
Nashville	\$80,525
Las Vegas	\$78,894
Jacksonville.....	\$77,923
San Antonio	\$77,432
Cincinnati.....	\$77,050
Cleveland.....	\$76,393
Tampa	\$74,150
Oklahoma City	\$71,623
Louisville.....	\$66,131

Life Sciences Concentration | KC Metro



Source: Jobs EQ

WAGE ANALYSIS, continued

Average Annual Wage BIOINFORMATICS	
San Jose	\$180,431
Austin	\$116,029
Seattle	\$108,002
Baltimore	\$106,638
San Diego	\$105,276
Denver	\$105,237
Portland	\$103,041
Minneapolis	\$102,151
Sacramento	\$99,611
Raleigh	\$91,762
Richmond	\$91,655
St. Louis	\$91,459
Las Vegas	\$90,175
Columbus	\$89,784
Nashville	\$89,508
Indianapolis	\$89,443
Charlotte	\$89,368
Tampa	\$88,748
Providence	\$88,032
Kansas City	\$87,959
Pittsburgh	\$86,765
San Antonio	\$85,407
Milwaukee	\$84,114
Cincinnati	\$81,960
Orlando	\$80,752
Cleveland	\$79,589
Virginia Beach	\$78,368
Jacksonville	\$77,562
Memphis	\$76,365
Louisville	\$74,986
Oklahoma City	\$67,859

Average Annual Wage MANUFACTURING	
Indianapolis	\$196,666
San Jose	\$141,837
San Diego	\$128,882
Raleigh	\$110,165
Providence	\$108,067
Minneapolis	\$105,184
Austin	\$103,884
Milwaukee	\$98,779
Memphis	\$95,860
Oklahoma City	\$92,814
Seattle	\$90,799
Baltimore	\$85,166
Denver	\$84,401
Richmond	\$82,869
Columbus	\$76,378
St. Louis	\$76,173
Sacramento	\$75,118
Kansas City	\$71,798
Pittsburgh	\$71,413
Charlotte	\$69,658
Cincinnati	\$68,129
Orlando	\$68,048
Cleveland	\$66,640
San Antonio	\$66,637
Nashville	\$66,308
Virginia Beach	\$65,000
Louisville	\$60,792
Tampa	\$59,470
Jacksonville	\$58,518
Portland	\$56,887
Las Vegas	\$53,094

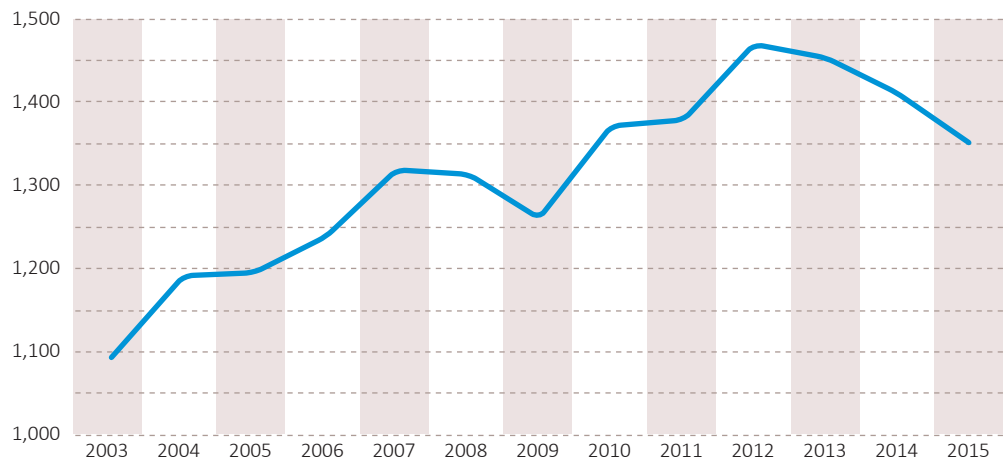
Average Annual Wage RESEARCH & DEVELOPMENT	
San Jose	\$206,279
San Diego	\$146,518
Raleigh	\$124,993
Sacramento	\$108,632
Seattle	\$103,150
Minneapolis	\$101,583
Baltimore	\$99,693
Orlando	\$94,649
Columbus	\$93,391
Pittsburgh	\$85,026
Portland	\$83,549
Virginia Beach	\$82,757
Indianapolis	\$80,265
Austin	\$79,833
Charlotte	\$79,319
Memphis	\$75,860
Cincinnati	\$74,675
Richmond	\$74,207
St. Louis	\$73,551
Cleveland	\$73,424
San Antonio	\$73,319
Denver	\$72,095
Las Vegas	\$67,460
Providence	\$66,254
Nashville	\$63,796
Kansas City	\$63,017
Oklahoma City	\$61,886
Tampa	\$56,820
Milwaukee	\$53,131
Louisville	\$51,941
Jacksonville	\$49,069

Source: Jobs EQ

EXPORTS

The region's life science industry exports trended lower over the last three years, but show an overall increase from \$1.09 billion in 2003 to \$1.35 billion in 2015.

KC Life Sciences Exports | 2003-2015, in millions



Source: Brookings Institution

INDUSTRY LEADER PERSPECTIVES

The TIE process included a series of facilitated discussions with industry leaders and educators to capture their insights on life science industry trends, challenges and opportunities.

The discussions, held in October 2016, focused on growing a talented workforce and key issues related to research and development, bioinformatics, and the nexus between animal and health science.

Growing a Talented Workforce

In general, life sciences industries in the Kansas City region prefer home-grown talent. In a survey of industry leaders, 65 percent said they had not recruited outside the region for entry-level positions in the past year, and another 19 percent said out-of-region recruitments were rare. While some entry level jobs require only a high school diploma or associate degree, most employers prefer to hire employees who have earned at least a bachelor's degree. It is critical for industry representatives to maintain open lines of communication with educational institutions across the educational continuum to ensure graduates enter the workforce with the necessary skill sets to succeed in life science companies.



"Our company is challenged with getting enough talent to fill our needs. Each company can do its own thing, but then you hit the issue of scale as a community. You can inspire 10 kids with a program, but you can't start to address the scale that's needed without a coordinated effort."

"Our main need is in the technical space. But even knowing that technical skill set, we can't articulate what people will be building two years from now."

"For a community college or four-year school to initiate a new program like bioinformatics takes a lot of resources — not only money, but faculty."



OPPORTUNITIES

Scalable Talent

- Use teacher externships to create an industry knowledgebase that can reach a larger scale.
- Incorporate applied/experiential learning strategies focused on core competencies.

Business/education partnerships

- Maximize business participation in experiential learning opportunities by providing structure.
- Create a system to connect business leaders with educational opportunities without bombarding them with requests.

Adaptability at educational institutions

- Move quickly to create certification programs that meet industry needs.
- Create industry-specific, stackable career credentials with a direct career pathway.

INDUSTRY LEADER PERSPECTIVES

Research and Development

Today, only about 26 percent of life science industry jobs are in traditional research and development. There is a general trend to outsource these roles to contract research organizations (CROs) and consultants. Large companies also buy innovation by licensing technologies from academic institutions or acquiring startup companies. Shrinking internal research and development capabilities within large pharmaceutical companies (both animal and human) have increased the importance of small and medium-sized biotechnology companies as external pipeline sources for new drugs, diagnostics, medical devices and technologies.



“R&D used to be an in-house function for a lot of companies. In 2007, Pfizer was spending \$8 billion on research and development. If you could take that and get ideas from universities and contract with CROs instead of having that power plant and equipment on the ground, it’s a tremendous cost savings and it’s a much more efficient operation.”



OPPORTUNITIES

- Promote the region’s CRO strengths as a one-stop shop for large companies.
- Encourage public/private partnerships between companies and universities.
- Create a vibrant life science ecosystem, including access to capital, to support startup companies.
- Support incubators and accelerators that support the life science industry and bring innovative solutions.
- Ensure universities and industry are well-connected in the region to facilitate collaboration and transfer of intellectual property.

ABOUT CROs

Contract Research Organizations (CROs) have become an increasingly significant component in the development of new pharmaceuticals, diagnostics and medical devices in the life sciences industry. Large pharmaceutical companies started reducing their internal R&D capacity in the late 1990s and increasingly rely on the basic research services, clinical trials capabilities and regulatory science expertise of CROs.

Kansas City is home to more than 90 CROs that serve U.S. and international companies, generating regional revenue in excess of \$1 billion per year. Their presence here is due in large part to Marion Laboratories, founded by Ewing Kauffman. As a result of its growth and multiple acquisitions and mergers, many former Marion employees stayed in Kansas City to start their own CROs — making the region a prime location to support the broader pharma industry.



INDUSTRY LEADER PERSPECTIVES

Bioinformatics

The term bioinformatics is used in its broadest context, including medical informatics, big data applications, clinical research informatics and health information technologies in support of outcomes research. All of these areas support research, development, and the application of computational tools and approaches for expanding the use of biological, medical, behavioral and health data. These systems are able to acquire, store, organize, archive, analyze and visualize data. With large informatics companies such as Cerner and Netsmart — and a fertile environment for bioinformatics startups — the region has the potential to be a national leader in this industry. People with a solid foundation in biology or chemistry who are skilled with information technology tools and applications are highly sought employees.



“We believe that Kansas City can absolutely be a national leader in the health IT and outcomes research area. We really believe that over the next 10 years, if we develop this ecosystem, we can truly be a national leader in the bioinformatics space. It’s up to us.”

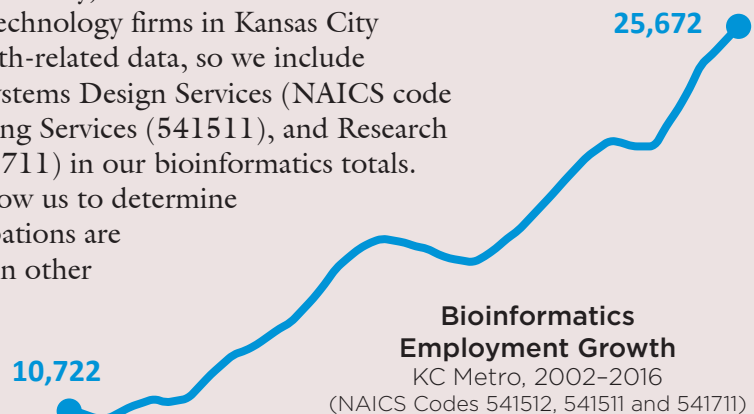


OPPORTUNITIES

- Grow our ability to analyze and apply data collected by groups such as the Kansas Health Information Network and the Lewis and Clark Information Exchange.
- Take advantage of significant high-performance computing capabilities found at major research universities.
- Define the job spectrum, necessary skill sets and education needs in the bioinformatics industry.

DEFINING BIOINFORMATICS

Bioinformatics is a high-paying, growth industry, but it is not well defined. We know that many of the information technology firms in Kansas City (such as Cerner) work with bio- and health-related data, so we include three NAICS codes — Computational Systems Design Services (NAICS code 541512), Custom Computer Programming Services (541511), and Research and Development in Biotechnology (541711) in our bioinformatics totals. Unfortunately, available data does not allow us to determine exactly how many workers in these occupations are employed in life sciences and how many in other industries. Even with this broader definition, the employment trendline clearly shows that Kansas City has the talent capacity to support this growing industry.



Source: Jobs EQ

INDUSTRY LEADER PERSPECTIVES

Nexus of Animal and Human Health

The animal health industry accounts for about 20 percent of the employment and 25 percent of the companies in life sciences in our region, which is recognized nationally and internationally as the Animal Health Corridor. By comparison, the much larger regional human health industry accounts for about 75 percent of the employment and 66 percent of the companies in life sciences in the region, yet it receives far less attention. Strategically, industry leaders seek to leverage our strengths in both human and animal health and the recognize the overlap between human and animal diseases. Discoveries in animal health may apply to human health and vice versa, but regulatory approvals for animal health products often take half the time at one-tenth the cost as for human health.



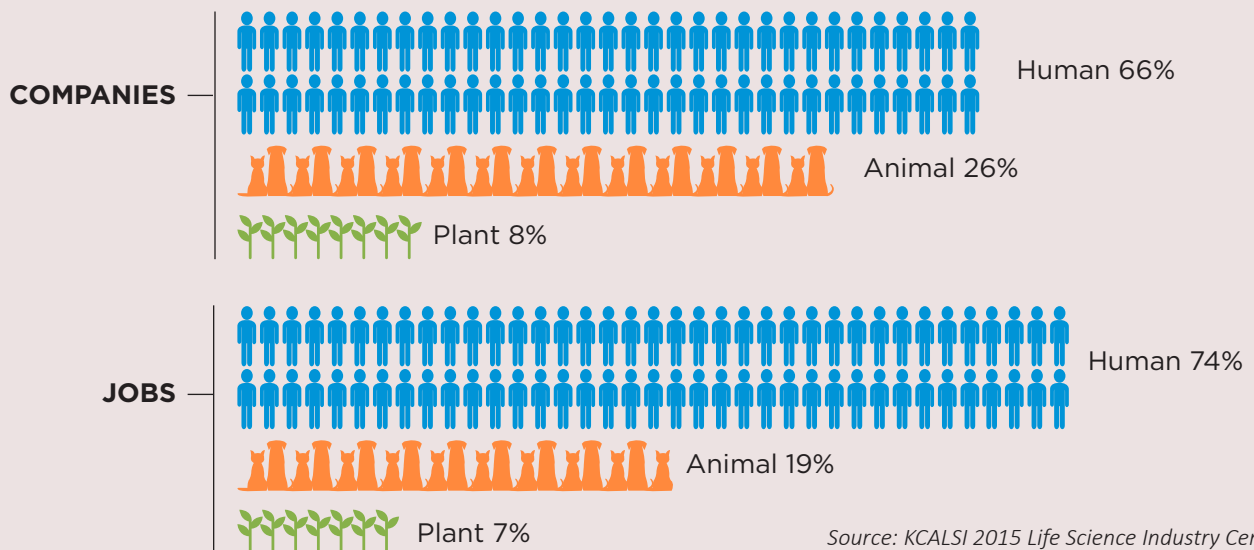
“This is definitely an area where there’s an intersection. When you have human health discoveries that can be applied to animal health, you have an earlier benefit that actually helps the human health because you provide more revenue and funding so there’s a quicker pathway to profitability.”



OPPORTUNITIES

- Identify and promote intersections between animal and human health. Humans and their pets share the same environment and often the same diseases, such as obesity that leads to diabetes.
- Overcome silos in industry, education and funding streams.
- Improve and expand interdisciplinary collaborations.

LIFE SCIENCES CONCENTRATION BY TYPE:



Source: KCALSI 2015 Life Science Industry Census (249 companies, 28,269 jobs)

HIRING DIFFICULTY

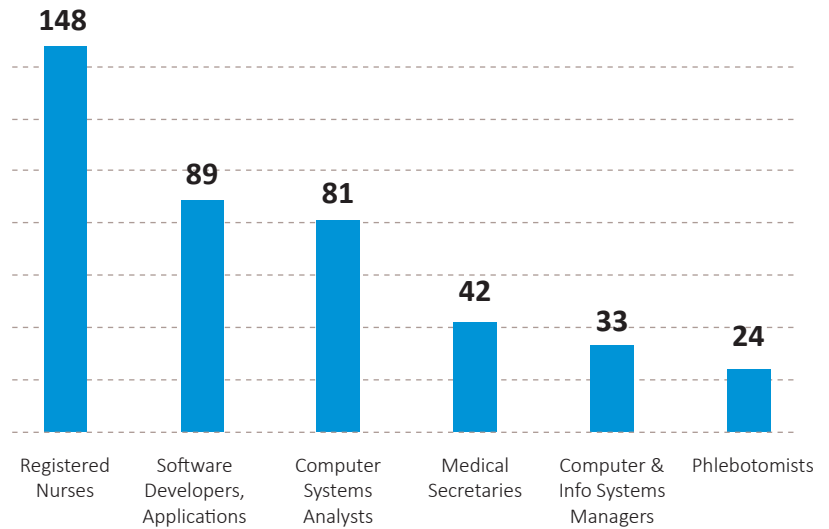
Workforce data shows that several key life-science occupations are consistently difficult to fill in the Kansas City region, leading to annual workforce supply gaps.

This does not appear to be due to a lack of educational output, as we have the educational capacity to meet workforce needs (see page 18). It is also not a compensation issue, as the wages for these specific positions appear to be competitive. One likely cause for workforce gaps is the competition for these occupations within the region.

Life sciences firms compete with a wide range of industries for IT workers, and clinical research firms compete with the local health care industry for medical professionals, making hiring more difficult and adding to the employment deficit.

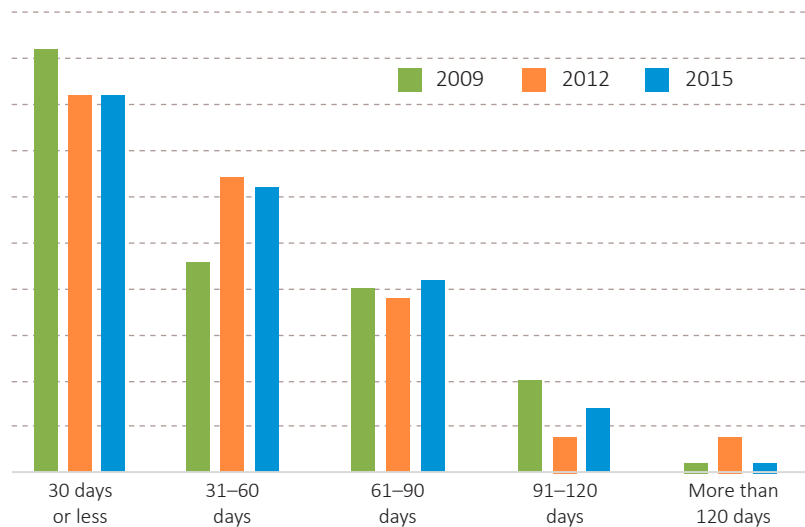
According to KCALSI's census of life science companies, vacancies are taking a bit longer to fill. In 2009, 45 percent of job openings were filled in 30 days or less. In 2015, 41 percent were filled within 30 days; more than half took one to three months to fill.

Annual Worker Supply Gap | Kansas City MSA



Source: Jobs EQ

Average Length of Vacancies | KCALSI Census



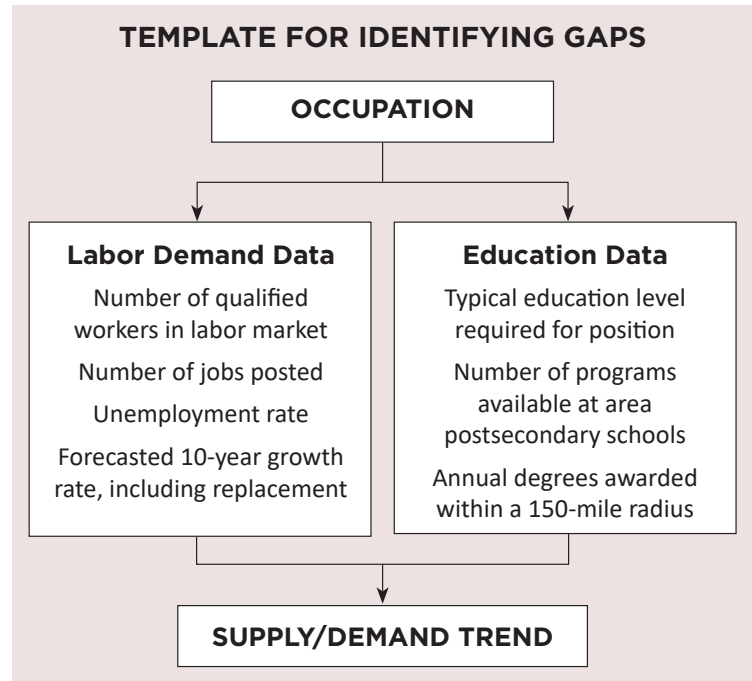
Source: KCALSI

LABOR DEMAND

To further examine workforce supply gaps in specific occupations, we developed a template to compare labor demand with educational output. By comparing total growth demand to the number of graduates expected over the next 10-years, we can anticipate trends and make adjustments to meet industry needs.

Using this template, a completed analysis of the Medical and Clinical Lab Technologist occupation is shown below.

For occupations that are common across more than one industry the template can yield unexpected results. For example, a similar analysis for registered nurses would show the region having a good balance between supply and demand; yet we continually hear from employers that there is a shortage of registered nurses. It may be that more nursing graduates leave the region or take non-traditional positions, adding to the labor demand gap.



OCCUPATION: Medical & Clinical Lab Technologist

LABOR DEMAND

Qualified workers in labor market today	1,500
Jobs posted	88 jobs at 31 employers
Unemployment rate	1.2% <i>(indicates low labor supply)</i>
10-year growth forecast	1.5%
Replacement	+697
Growth	+362
Total demand	+1059



EDUCATIONAL CAPACITY

Typical entry-level requirement	Bachelor's degree
Programs available at area schools	4 bachelor programs
Degrees awarded in a 150-mile radius	54 <i>(2014-2015)</i>
Anticipated awards over 10 years	540

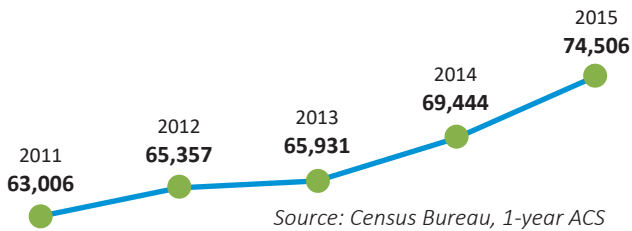
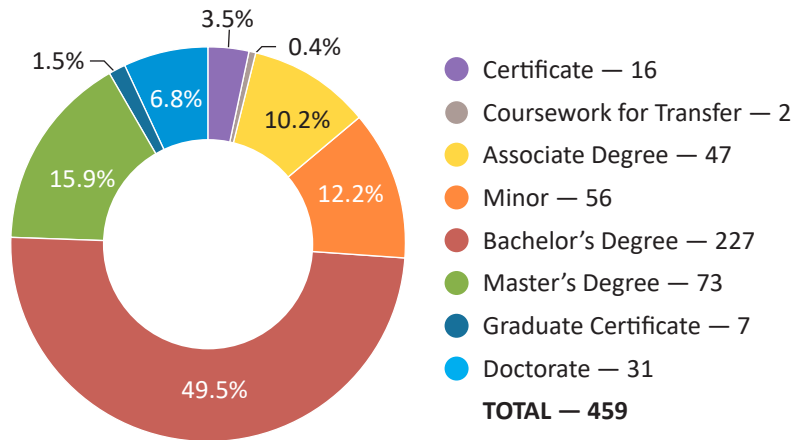
TREND: 540 graduates in 10 years will meet only 51 percent of demand

GROWING AND ATTRACTING TALENT

MARC's 2016 Educational Asset Inventory found a total of 459 life science credentials available at 34 public, private and for-profit colleges and universities in the region. Just over half of the available degrees are at the bachelor's level.

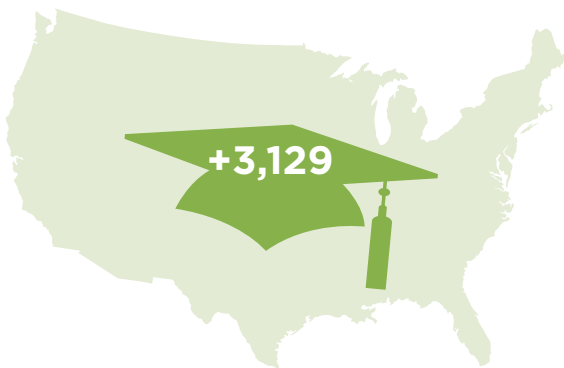
The full asset inventory, including a list of programs by institution, is available online at kcworkforce.com/reports.htm.

Life Science Credentials Available by Type



STEM Degrees Among Young Adults Kansas City MSA

The region has seen a 13 percent increase in the number of young people (25-34) holding STEM degrees since 2011.



Brain Gain

In 2015, the Kansas City region had a net brain gain, as 3,129 more people with bachelor's degrees moved into the region than moved out.

Source: Census Bureau, 1-year ACS

Degrees Awarded | Select life science occupations, 2014-15 school year, within a 150-mile radius

Occupation	2-Year	4-Year	Post-Grad	Total
Phlebotomist	101	0	0	101
Medical Scientist	5	202	170	377
Registered Nurses	1,320	2,983	771	5,074
Medical and Clinical Lab Technologists	0	56	0	56
Medical and Clinical Lab Technicians	47	12	0	59
Software Developers and Programmers	367	848	1,107	2,322
Chemical Technicians	0	0	0	0
Radiologic Technologists	186	67	0	253
Chemist	7	355	69	431
Biological Technicians	16	0	63	79
Biological Scientists	83	1,817	225	2,125
Medical Secretaries	192	0	0	192

Source: Jobs EQ

COMMON SECTOR COMPETENCIES

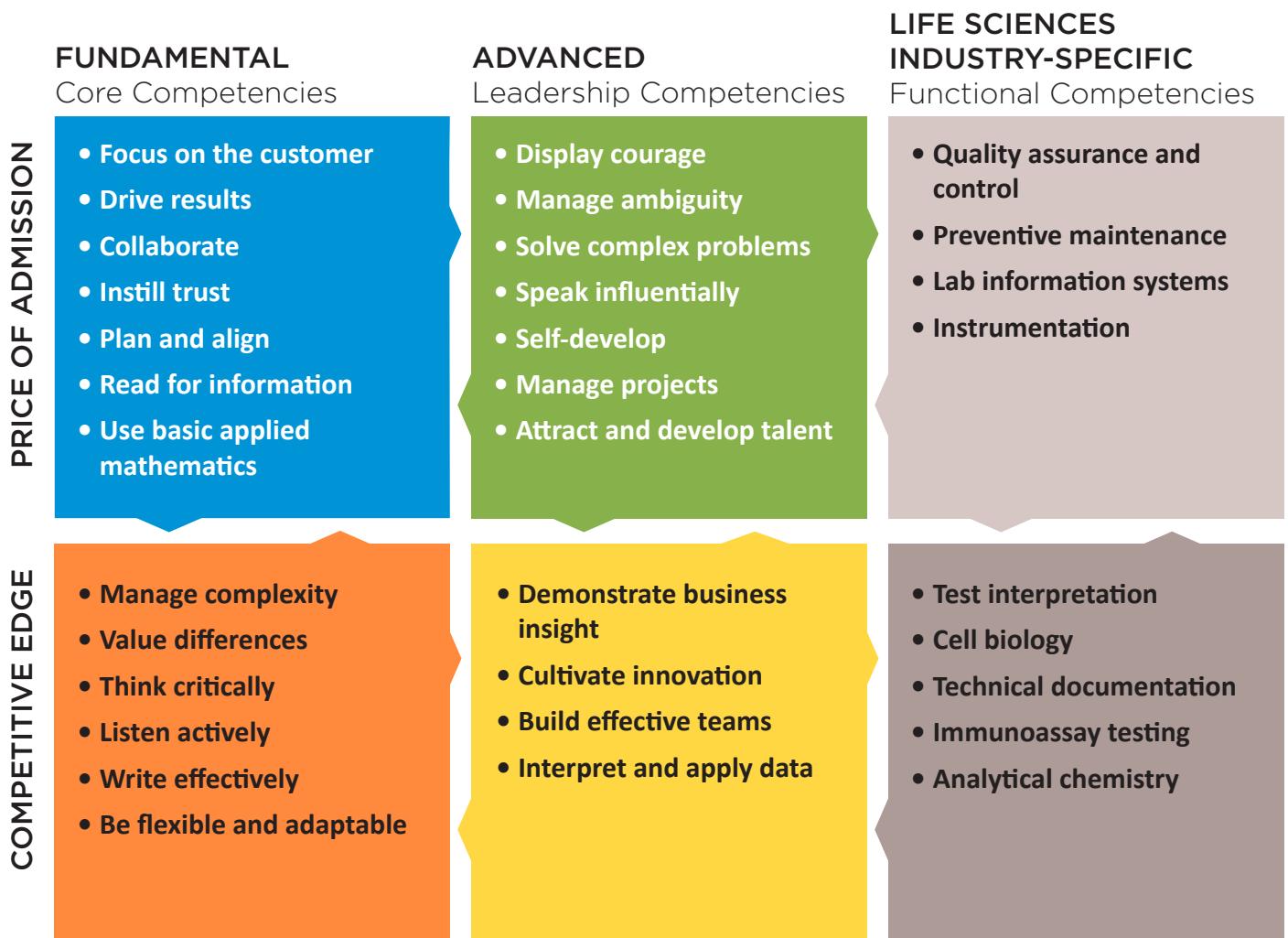
The KC Rising Human Capital Common Sector Competencies Task Force developed the model below to illustrate progression in competencies that lead to a more skilled workforce.

A competency is the combination of observable and measurable knowledge, skills, abilities and personal attributes required to successfully perform tasks in a defined work setting.

Common sector competencies (in the left and middle columns) are the key strengths and essential qualifications for employee performance across key industries and sectors

in the Kansas City region. Industry-specific competencies for life sciences industries are shown in the right column. In addition, competencies are grouped by “price of admission” in the top row — skills that are easier to find or train — and “competitive edge” in the bottom row, with skills that are less intuitive, more difficult to develop, and often in short supply.

These lists were created using established collections of competencies, job postings, and surveys of hiring managers and industry leaders about their competency needs.



CAREER LADDERS

The life sciences industry offers good career ladders, with a wide variety of entry-level positions and opportunities for advancement as an employee continues his or her education and gains work experience.

Kansas City-area life science companies often prefer to recruit local talent and promote from within. Professional advancement typically takes one of two paths — technical positions or management positions.

The career ladder diagrams shown here are adapted from a publication on biotechnology careers produced by KCALSI. The full report will be published in March 2017 and available online at www.kclifesciences.org.

KNOWLEDGE AND SKILLS FOR CAREER ADVANCEMENT

TOP 10 SKILLS SOUGHT | US Biotech Industries

- Complex Problem Solving
- Judgment and Decision Making
- Systems Evaluation
- Systems Analysis
- Instructing
- Coordination
- Time Management
- Quality Control Analysis
- Social Perceptiveness
- Service Orientation

TOP 10 KNOWLEDGE AREAS SOUGHT

| US Biotech Industries

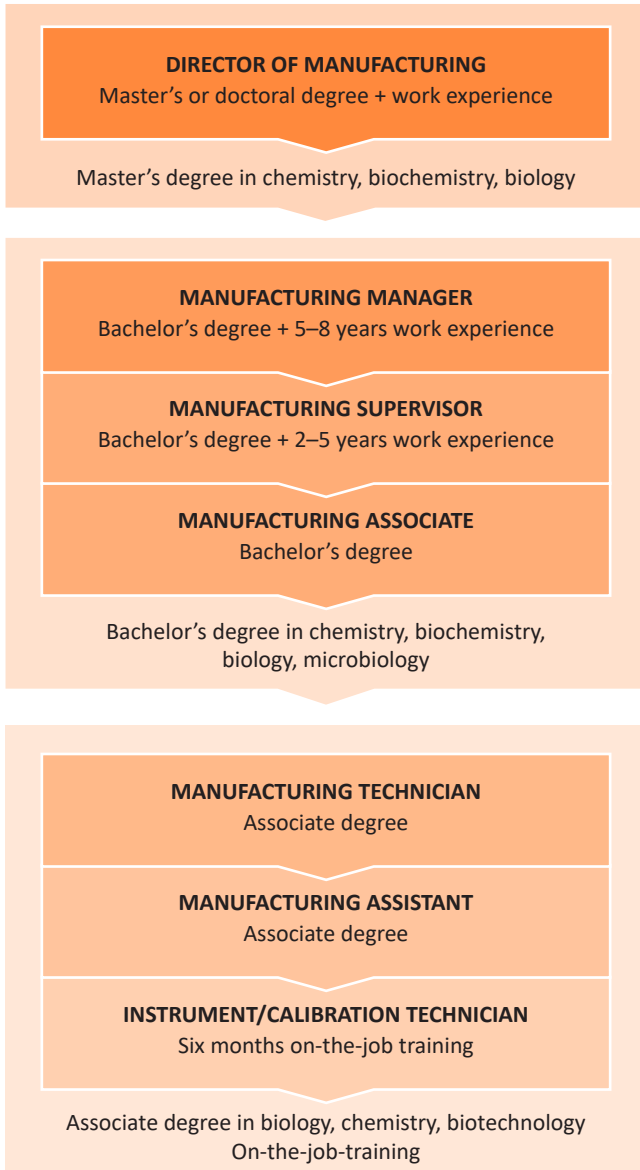
- Computers and Electronics
- Mathematics
- English Language
- Customer and Personal Service
- Education and Training
- Engineering and Technology
- Administration and Management
- Clerical
- Design
- Telecommunications

Source: O*Net and Jobs EQ

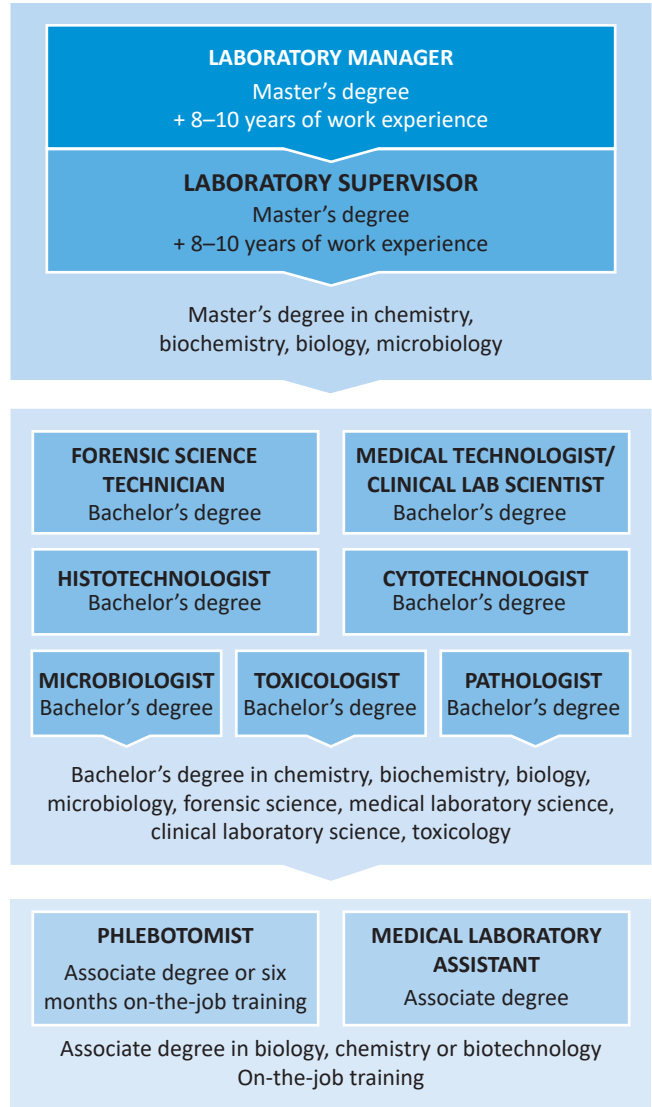
RESEARCH & DEVELOPMENT



MANUFACTURING

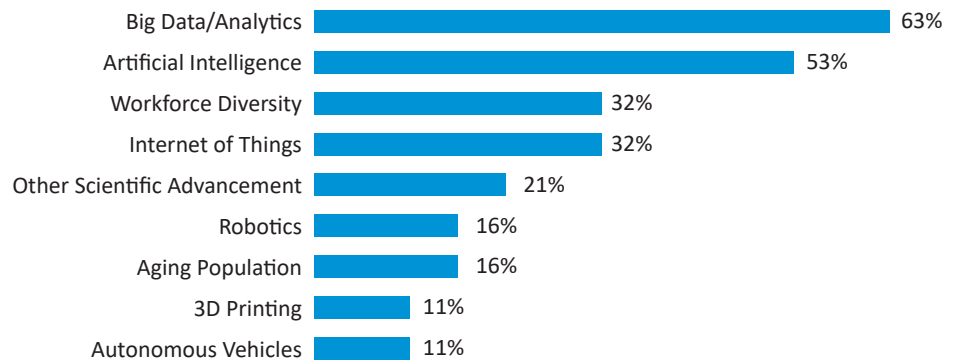


DIAGNOSTIC/TESTING



POTENTIAL INDUSTRY DISRUPTORS

In our survey of life science industry leaders, we listed a series of potential disruptors and asked which they thought might have the most impact on their companies in the near future. The results are shown here.



CONCLUSION AND NEXT STEPS

The life-sciences industry is an important, multi-billion dollar component of Kansas City's regional economy. While the region already has some specialization in this area, we have the industry base and educational assets necessary to increase that specialization. As this labor analysis illustrates, we have a strong combination of established companies and innovative startups, along with the ability to develop and retain a talented workforce. We can define our future and determine what role we want Kansas City to play on the national stage.

In the coming months, civic, industry and educational partners will use this analysis to create an action plan that identifies strategies to meet workforce needs; provides a timeline for implementation; identifies potential funding sources; makes policy recommendations; proposes an evaluation strategy; and recommends a strategy leader.

As the life sciences Talent-to-Industry Exchange action plan is developed, work is already underway on the next TIE labor analysis, KC Global Design, which will analyze the region's specialization in architecture and engineering.



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UP NEXT:



The next TIE will focus on the region's Global Design industry. An industry-led committee has been established and business engagement is underway. Look for the KC Global Design labor analysis later in 2017.

APPENDIX

LIFE SCIENCES INDUSTRIES BY NAICS CODE

This report analyzes data in 23 life science industries, some of which overlap with other sectors. The specific NAICS codes used are shown in the table below.

NAICS #	Industry Title
311119	Other Animal Food Manufacturing
325320	Pesticide and Other Agricultural Chemical Manufacturing
325411	Medicinal and Botanical Manufacturing
325412	Pharmaceutical Preparation Manufacturing
325414	Biological Product (except Diagnostic) Manufacturing
333241	Food Product Machinery Manufacturing
333243	Sawmill, Woodworking, and Paper Machinery Manufacturing
333244	Printing Machinery and Equipment Manufacturing
333249	Other Industrial Machinery Manufacturing
334510	Electromedical and Electrotherapeutic Apparatus Manufacturing
334517	Irradiation Apparatus Manufacturing
339112	Surgical and Medical Instrument Manufacturing
339113	Surgical Appliance and Supplies Manufacturing
339114	Dental Equipment and Supplies Manufacturing
541380	Testing Laboratories
541511	Custom Computer Programming Services
541512	Computer Systems Design Services
541513	Computer Facilities Management Services
541519	Other Computer Related Services
541711	Research and Development in Biotechnology
541712	Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)
621511	Medical Laboratories
622310	Specialty (except Psychiatric and Substance Abuse) Hospitals

