



BioNexus | KC

Catalyst for Innovation in Animal & Human Health

**Kansas City
Regional Life Sciences
Industry Census 2018**



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Executive Summary

BioNexus KC has commissioned an industry census of the region's life sciences companies every three years since 2003 to define the regional composition of life sciences companies and to define the scope of economic activity in this vital sector of the region's economy. BioNexus KC contracted with Investment Resources for each census project since 2006, providing consistency in methodology and definitions that permit appropriate comparisons between the 2018 report and the reports completed in 2006, 2009, 2012, and 2015.

The goal of the current census is to:

- Update the previous census of life science companies completed in 2015.
- Illustrate the areas of growth and expansion in the last three years.
- Identify employment and research trends in the region's companies.
- Provide an accurate resource for policymakers, economic and workforce development professionals, educators, scientists, and companies.

Companies included in this census were required to meet a formal definition of a life sciences company. A census life science company is defined as a company that engages in research and development for the benefit of humans, animals or plants and/or directly supports research and development activities within life sciences.

The 2018 census identified 292 companies in 23 counties in the Kansas City MSA, and regions surrounding St. Joseph, MO, Kansas State University in Manhattan, the University of Kansas in Lawrence, and the University of Missouri in Columbia. Conservative employment estimates for these 292 companies indicate about 35,000 employees. A net increase of 43 companies in the region represents impressive 17% growth in companies, with 22% employment growth since the 2015 census.

Human health-focused companies account for two-thirds (67%) of the companies in the region, a similar percentage reported in the 2012 and 2015 censuses. Animal health-focused companies represent one quarter of the region's companies, but only 16% of employment. Plant and crop science-focused companies, comprise a relatively small portion (8%) of the total regional life sciences company portfolio.

Kansas is home to about 64% of the life sciences companies in the region, and about 44% of employment, while Missouri houses about 36% of the companies, and about 56% of the total employment. While both states have grown in company number and total employment, Kansas has continued to gain companies relative to Missouri with the relative share of employment growing less quickly.

Companies in the Biotechnology Research and Testing, and Drugs and Pharmaceuticals segments account for just over half of the companies in the region. The total number of companies in the Biotechnology Research and Testing segment, however, has declined since 2015, while all other segments have grown, with the Health IT segment posting the largest increase, with 20 net new companies in the region since 2015.

Eleven companies: Bayer Animal Health, Bayer Cropscience, Boehringer Ingelheim Vetmedica, Inc., Catalent Pharma Solutions, Cerner Corporation, Hill's Pet Nutrition, Inc., IQVIA, MFA, Inc., Netsmart, PRA International, and Quest Diagnostics are the largest companies in the region, with two-thirds of the total employment in the region.

The significant growth in the number of companies is driven by the number of new companies formed or located in the region, and fewer companies closing or relocating out of the area than in 2015. One hundred of the 292 companies have fewer than 5 employees in 2018. Much of the net gain in the number of companies since 2006 has been companies employing between two and 24 workers, which points to an opportunity for the region to focus efforts on supporting an environment for business growth.

The full report details announced, completed or in process expansions since 2015. Sixteen notable mergers, spin-offs or acquisitions affecting the region were noted in the 2016-2018 Census period.

Significant academic research assets represented by BioNexus KC's stakeholder institutions serve as innovation hubs for the region. One hundred and thirty-one university research centers contribute to the growing regional asset base. Robust clinical trial activity is performed in 25 of the region's hospital and medical centers to advance research.

The Census surveyed companies regarding workforce, sales and research expenditures with about one-third of the region's companies providing requested data. Of the 96 survey respondents, just over half reported an increase in employment in the last year; only six company respondents noted a decrease in staff.

Company respondents were slightly less optimistic regarding workforce projections in 2018 than in 2015, with 86% indicating plans to hire one or more employees in the next three years. Only one respondent noted plans to cut staff, and 14% are expecting stable headcount. The largest company respondents projected larger increases than small companies, although a segment of small and mid-sized companies anticipated double-and triple-digit hiring in the next 3 years.

Demand for Master's and PhD level positions has remained stable in all Census surveys since 2006. However, despite a decline in 2018 relative to past Census survey results, the Bachelor's degree level position is still the largest need, with 50 companies projecting a Bachelor's degree level position in the next 3 years.

About 60% of respondents reported an average time to fill entry level vacancies of more than 30 days, similar to Census surveys in 2012 and 2015. Those respondents, however, also reported an increase in recruitment outside of the region for these positions as compared to 2015. Of the respondents reporting 2018 sales data, 73% have less than \$20 million in sales, and 24% have sales less than \$100K, including 11 companies who report pre-revenue status.

Sixty-two percent of respondents reported estimated research expenditures of less than \$500K in 2018. Research projections for 2019 show a marked increase in the number of company respondents reporting projected expenditures of \$1-5 million relative to current year expenditures, and 31% of company respondents project research expenditures of over \$1 million in 2019. These results indicate expectations of expanding research budgets, and represent the highest number of companies projecting research budgets over \$1 million since the 2006 Census.

The 2018 Life Sciences Industry Census continues to document a robust trend of growth in the regional life sciences cluster since 2006. The triannual assessment represents a one of a kind snapshot of life sciences companies, their subsectors, geography, size, and employment.

Additionally, the report provides insights into workforce development issues, such as long- and short-term hiring, preferred educational attainment, vacancies, and recruitment strategies. BioNexus KC remains committed to positively impacting the growth of life sciences in the region.

Background

BioNexus KC, formerly the Kansas City Area Life Sciences Institute (KCALSII) has commissioned the Life Sciences Census effort every 3 years since 2003 to map the scope and activity of this vital sector. The initial Census was conducted in 2003 by the Kansas City Area Development Council (KCADC) and KCALSII, however, the methodology was significantly less stringent than those used in subsequent years. The 2003 report, spanning a 23-county region, documented 155 life science companies employing about 15,000 people.

The 2006 Census identified 199 life sciences companies in 23 surrounding counties that comprise the Kansas City region. A total of 174 of the 199 companies reported their actual or estimated number of employees, indicating regional companies in this industry sector employ between 17,500 and 20,000 people.

The 2009 Census identified 206 companies in 24 counties, defined as the 18 counties serviced by the Kansas City Area Development Council, the three counties in the University of Missouri/Columbia, MO region, and Riley County in Kansas, home of Kansas State University in Manhattan, KS. One company each was identified in Geary County, Kansas and DeKalb County, Missouri, although those counties were not included in the original search process. Estimates for these 206 companies indicated that regional companies in the life sciences sector conservatively employed between 18,000 and 20,000 people.

The 2012 Census identified 240 companies in 25 counties, both clustered around the Kansas City MSA (metropolitan statistical area) and appropriate counties clustered around the University of Missouri/Columbia, MO region, and Riley County in Kansas, home of Kansas State University in Manhattan, KS. Estimates for these 240 companies indicated that regional life sciences companies conservatively employed between 22,000 and 24,000 people.

The 2015 Census identified 249 companies in 26 counties, both clustered around the Kansas City MSA (metropolitan statistical area) and appropriate counties clustered around the University of Missouri/Columbia, MO region, and Riley County in Kansas, home of Kansas State University in Manhattan, KS. Estimates for these 249 companies indicated that regional life sciences companies conservatively employed between 28,000 and 30,000 people.

The 2018 Census identified 292 companies in 26 counties, including the regions of Kansas City MSA (metropolitan statistical area) and St. Joseph, MO, and appropriate counties clustered around the University of Missouri/Columbia, MO region, and Riley County in Kansas, home of Kansas State University in Manhattan, KS. Conservative estimates for these 292 companies indicate that regional life sciences companies employ nearly 35,000 people.

Census reports have been widely circulated to policymakers, economic and workforce development professionals, scientists, educators, and companies seeking to contribute to the growing regional life science industry. The 2015 Census was downloaded or distributed to over 260 persons in 19 different US states and Sweden. Given that three years have elapsed since the 2015 study, BioNexus KC commissioned a follow-up study of life science companies in the region.

The purpose of the current and previous Census:

- To update the previous Census of life science companies completed in 2015.
- Illustrate the areas of growth and expansion in the last three years.

- Identify employment and research trends in the region’s companies.
- Provide an accurate resource for the many users of the census- including policymakers, economic and workforce development professionals, educators, scientists, and companies.

Methodology

Defining the Life Science Region

Each Census effort since 2006 included the counties designated as the Greater Kansas City Area, plus four counties in the University of Missouri/Columbia, MO region, and three counties in the area of Kansas State University in Manhattan, KS. Additional companies located in adjacent counties over previous Census efforts have added DeKalb and Bates counties in Missouri, and Doniphan County in Kansas. (Figure 1 and Table 1).

Figure 1: Life Sciences Region in 2018 Census

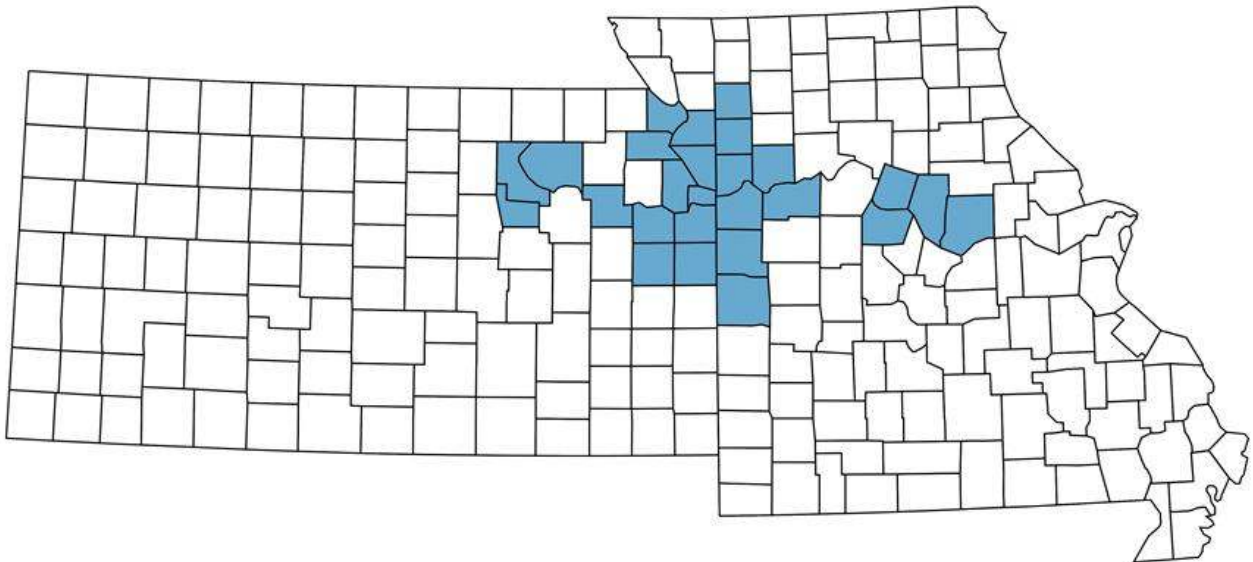


Table 1: Life Sciences Region in 2018 Census

<i>Kansas Counties</i>		<i>Missouri Counties</i>	
Atchison	Miami	Bates	Cooper
Douglas	Pottawatomie	Boone	DeKalb
Doniphan	Riley	Buchanan	Howard
Franklin	Shawnee	Callaway	Jackson
Geary	Wyandotte	Cass	Lafayette
Johnson		Clay	Platte
Leavenworth		Clinton	Ray

It should be noted that while the number of counties searched has increased over the Census period, this expansion has not had a significant impact on the overall count of companies and

employees. In each case, the county was added as a result of the identification of a single company whose activities fell within the Life Sciences definition, which has been consistent since the 2006 Census.

Life Sciences Defined

Reports and surveys often utilize the North American Industrial Classification System (NAICS) codes to classify companies within a definition of life science companies. While industry databases were searched using these codes for initial leads, the key criteria for inclusion in this report was meeting a formal definition of a life sciences company.

For each Census since 2006, **life sciences** are defined as *the study of the biology or chemistry of animals, humans, or plants*. A more elaborate and commonly used definition is “any of the several branches of science dealing with the study of living organisms and their organization, life processes and relationships to each other and their environment.” A **life sciences company** is defined as a company *engaged in research and development within life sciences and/or an organization that directly supports research and development activities within life sciences*. This definition has remained constant in each of the last five reports, to maintain the ability to compare results across previous Census efforts.

Process

Utilization of SIC or NAICS codes that represent life sciences activity provides an initial list of companies to review for inclusion in the Census report. These codes in databases, however, may not fully capture the full activity of the companies, or may be incorrect. A review of the codes provided for about 50 of the 2015 Census companies, indicated that the consistent code list utilized in the 2006 – 2015 Census efforts fell short in identifying some of these companies.

Additionally some changes have been made in the NAICS classification system, which has necessitated the refinement of the Code list to reflect the expansion of NAICS Codes in some industry segments. As a result, 5 additional codes were added to the initial search list. (Table 2) The effect of this addition was not a key factor in the addition of 42 companies to the list since 2015. Most of the companies located as a result of these additional codes were also identified by other resources as noted in the following process.

Initial sources included commercial databases (Hoover’s, InfoUSA/Salesgenie, Business Journal Book of Lists), and internal lists from BioNexus KC. Secondary sources were then utilized to capture additional results due to misclassification, omission, or relocation. This process resulted in a list of over 1000 companies. These companies were then reviewed for suitability for list inclusion, including phone calls, website reviews, and consultation with industry resources.

This refinement process pared the original list to approximately 300 companies. A letter from Wayne Carter, President and CEO of BioNexus KC was sent in May 2018 to these 300 companies explaining the purpose of the Census and providing instructions for completing the census/survey online, or by fax, mail or email. The complete Census questionnaire is provided as part of the Appendix to this report.

Table 2: Industry Codes Used in Preliminary Company Identification

Industry Codes Used in Preliminary Identification				
SIC		NAICS	SIC	NAICS
2048	Prepared feeds, NEC	311119	3844	X-ray apparatus and tubes
2833	Medicinals and botanicals	325411	3845	Electromedical equipment
2834	Pharmaceutical preparations	325412	7372	Prepackaged software
2835	Diagnostic substances	325413	7371	Custom Computer Programming Services
2836	Biological products, except diagnostic	325414	8069	Specialty hospitals, except psychiatric
2869	Industrial organic chemicals, NEC	325199	8071	Medical laboratories
2879	Agricultural chemicals, NEC	325320	8099	All other misc ambulatory healthcare svc
3559	Special Industry Machinery, NEC	333298	8731	Commercial physical research
3821	Laboratory Apparatus and Furniture	*333999	8731	Commercial physical research
3829	Measuring and controlling devices, NEC	339112	8731	R&D in the Physical, Engineering, & Life Sciences
3841	Surgical and medical instruments	339112	8733	Noncommercial research organizations
3842	Orthopedic appliances	339113	8734	Testing laboratories
3843	Dental equipment	339114	8999	Other Scientific & Technical Consulting Svc
3851	Ophthalmic Goods Manufacturing	339115	8748	Other Scientific & Technical Consulting Svc

**additional codes added since the 2015 Census*

As commercially available lists included companies whose activities do not fall within the Life Sciences definition, and omitted some companies whose activities do fall within the definition, secondary sources for identifying additional companies, were used to further refine the list, including:

- Correspondence or conversations with over 20 chamber of commerce or economic development professionals from throughout the region.
- Internal lists maintained by BioNexus KC.
- Companies listed as part of the Animal Health Corridor by Kansas City Area Development Council (KCADC).
- Companies listed as members of BioKansas.
- Companies awarded SBIR or STTR grants in 2015, 2016 and 2017.
- Companies listed as clients in regional business incubators or accelerators.
- Correspondence and interviews with area business development professionals, early stage business advisors, and business incubator managers.

These activities resulted in the identification of about 50 more companies for potential inclusion who were mailed a Census invitation letter in June 2018, and an additional 30 companies who were mailed a Census invitation letter in July 2018, for a total of ~380 mailed requests.

The full scope of the information gathering used to produce this report is referred to as ‘Census’ activity. One activity as part of this information gathering process was the questionnaire sent to all targeted companies, which had two parts: Section One was the census form, or basic classification information:

- Company name and address
- Approximate number of employees
- Primary area of focus – plant, animal or human
- Primary area of expertise (Drugs and Pharmaceuticals, Health IT, etc)

Section Two, referred to in this report as the 'survey', asked companies for insights into workforce needs, sales, research expenditures and growth expectations. Respondents were assured that only aggregate data would be reported to indicate trends and totals to maintain confidentiality.

Respondents had the option of returning the census/survey form via US mail, email, fax, or by completing it online at the BioNexus KC website. Follow up requests were also made via the BioKansas newsletter, KC SourceLink correspondence, and personal outreach by BioNexus KC staff and other supportive contacts throughout the region.

All companies identified by the above methods were contacted by mail, and those who did not respond to the initial request were contacted by phone at least once. Ninety-six company census responses fitting the primary life sciences definition were received via the online census tool, mail, fax, email or via response over the phone. The remaining company representatives either declined to participate or did not return calls. These companies were investigated using the internet, via a website review, articles written about the company, or third party information such as an economic development professional from their geographic area. From the initial target list of about 380 companies, 88 companies were reviewed and subsequently excluded from the list for the following reasons:

- The company's areas of expertise did not fit the life sciences definition. For example, companies who were identified by a Life Sciences NAICS code in a database but only maintain a sales office in the region were excluded.
- No information could be located about the company – letters were returned, phones disconnected or not answered.
- The company was confirmed as no longer in business, or the location in this region closed.
- The company relocated out of the region.

Criteria for Inclusion on the List

To be considered a "life sciences company" at least one of the company's stated areas of expertise must include **research and development focused on the biology or chemistry of animals, humans, or plants and/or an organization that directly supports research and development activities within life sciences**. While supporting companies play a vital role in sustaining a life sciences economy, the primary focus of this census was creating an accurate picture of companies whose efforts directly support the creation of new products or intellectual property. Past Census efforts have also included 'Life Sciences Software' as an area of expertise. However, information technology contributions to life sciences research have expanded beyond just software. For instance, Orion Integrated Biosciences develops genome analysis algorithms, or iShare Medical provides technology for secure sharing of medical records. As a result, Life Science Software has been renamed Health Care Information Technology (IT) in this 2018 Census report.

Employee Headcounts

For companies who did not respond to the census, estimates for employee headcounts for the report sections regarding employment were obtained via commercial databases, local economic development professionals, media coverage of the company, company press releases, or websites. As these sources are reasonable sources to obtain this information, but may not be the most current figures, employment data should be considered as an estimate. Employment numbers are reported in aggregate either at the headquarters location, or the location where research and development activities take place if the headquarters is not in the region. Each company is listed once, unless the activities at each location differ, as is the case, for example,

for Bayer Animal Health and Bayer CropScience. However, Cerner's company's size and impact on employment totals necessitated that employment figures include a count for both Missouri and Kansas locations, so as not to skew employment totals reported by region.

Industry Presence, Overview & Analysis

Introduction

Despite headwinds in the US due to uncertainties in healthcare reform, rapid technological change, and increasing competitive pressures, the region's life sciences industry continues to grow and innovate in response to these challenges.

In health care, consolidation among providers, especially hospitals, the changing demands and expectations of patients seeking a greater role in their own care; and increasing cost pressures from payors leading to calls for pricing reform are creating a more 'value-based' rather than 'volume-based' industry. As technology evolves from basic descriptive analytics towards the realm of predictive insights, the autonomy of the individual physicians is declining, as rule-based, protocol-driven care is adopted.

The pharmaceuticals industry is at the early stages of a fundamental shift as a focus on precision medicine drives advantages in drug development, such as reducing time-to-market and making R&D processes more efficient. Despite this focus, however, most companies have yet to harness the full potential of precision medicine. External barriers include insufficient access to high-quality data, an unclear regulatory framework, a lack of standards, and data privacy issues. Internally, many companies lack the capabilities — particularly regarding the generation, integration, and analysis of non-trial-related patient data — that precision medicine requires.

The rapidly increasing importance of analytics in life sciences is evidenced in the Census region with the growth in the number of Health Care IT companies. Over the last several decades, the volume and variety of medical information has expanded significantly, a trend driven in large part by continued innovation and large-scale utilization of electronic medical records, high-resolution medical imaging, and next-generation genomics. Companies are now beginning to realize the benefits of analysis, and visualization of large, diverse data sets in cloud-based storage and distributed computing power platforms to drive informed decisions.

The medical device space is also heavily impacted by strides in analytics, as devices can capture data useful to life sciences researchers. With a tightening reimbursement climate, the medical device industry has seen consolidation and increasing collaboration, as end to end solutions to better manage patient health take precedence over single solution providers. For example, Garmin, who has been innovating in wearable technology for the last decade, have begun work on multiple research projects combining the high-quality sensor data from Garmin devices and the health care expertise of KU Medical Center researchers.

According to the Kansas City Area Development Council, between Columbia, Missouri, and Manhattan, Kansas, sits the single largest concentration of animal health interests in the world. While this branded region includes a broader scope of companies than are included in this report, the number of animal health companies in this Census has increased steadily since 2006.

Change has been a constant in this sector, with mergers of Boehringer Ingelheim Animal Health and Merial in 2017; numerous acquisitions by Zoetis, Merck Animal Health and others; and the September Elanco IPO, which raised \$1.5 billion. The November 2018 Bayer announcement that the company was exiting the animal health business signals a continuation of the shifting environment. However, record funding of pet and animal health startups indicates that innovation is continuing at a healthy pace. For example, Mars Petcare and Digitalis Ventures launched a \$100 million Companion Fund in March 2018 to focus exclusively on pet care innovation in areas such as health, diagnostics, nutrition, and services.

Ernst & Young's November 2018 report, *Global Capital Confidence Barometer*, cites ongoing regulatory and policy uncertainty as well as digital disruption concerns as reasons for reduced merger and acquisition (M&A) activity in the global life sciences industry relative to prior years. In 2017, medical device/technology deals rose 50%, while total volume and value of life sciences industry M&A fell nearly 20% compared to 2016. The report notes that ventures such as alliances, asset swaps and joint ventures have been the dominant focus for growth in the past year, although almost half (48%) of the executives surveyed indicated that they intend to pursue M&A in 2019.

A Deloitte survey of life sciences CFO's in 2018 showed that a greater percentage of CFOs noted plans to invest in activities intended to grow their business rather than in share buybacks or M&A. Sixty-five percent of surveyed companies plan to invest in R&D, 55% in general business operations and 50% in capital projects. Share buybacks and M&A ranked fifth and sixth.

Despite evidence of M&A activity slowdowns in the broader US, change has been evident in the Kansas City region. Sixteen noteworthy transactions affecting area companies have been noted since the last Census in 2015, compared to 11 transactions noted in the 2012-2015 period. The largest transactions were in the animal health space, but the biotechnology research and testing and medical device sectors saw the most activity. Cerner continues to expand its innovation and footprint in the region, with the launch of their Innovation Campus in South Kansas City. A dozen other companies announced or launched expansion in the region over the last 3 years, which contributed to overall employment growth of over 6,000 employees since 2015. A record 71 new companies identified in the 2018 Census, with a total of nearly 1,000 employees, points to continued optimism for the Life Sciences industry in the region.

Presence and Overview

While the primary focus of this report is the company Census and survey, the presence of companies in the region is influenced by numerous impacts in and outside of the region, including mergers, acquisitions, expansions, and closures. The life sciences company presence is also bolstered with University and Hospital research, and Business Accelerators, Incubators and New Business Facilities.

Regional Developments 2016-2018

Children's Research Institute Launches Major Expansion

Children's Mercy Hospital launched construction of a new Pediatric research institute at its Adele Hall Campus in Kansas City, MO. Children's Mercy, the only National Cancer Institute (NCI) Children's Oncology Group institution in the Midwest Cancer Alliance, is the pediatric consortium partner for the National Cancer Institute-designated University of Kansas Cancer Center and the Stowers Institute for Medical Research. In January 2018, the Hall Family Foundation and the Sunderland Foundation announced a combined donation of \$150 million to

launch construction and recruitment for the \$200 million Institute. The facility will greatly expand the Institute and support the hospital in carrying out precise diagnosis and treatments for complex childhood diseases and to provide quality care and treatment for some of the most difficult medical cases. With six times more space for carrying out research, the new facility is expected to have more than 3,000 employees.

National Bio and Agro-defense Facility Construction Progresses

The National Bio and Agro-defense Facility, or NBAF, in Manhattan, KS will be America's foremost animal disease research facility. After a three-year site selection process, Manhattan, Kansas, was selected as the location to replace the aging Plum Island Animal Disease Center in New York. The facility is under construction adjacent to Kansas State University's Manhattan campus and is adjacent to the university's Biosecurity Research Institute. The \$1.25 billion biosafety level-4 laboratory, being constructed by the U.S. Department of Homeland Security, remains on pace to reach the program's milestone for achieving initial operating capability for NBAF by May 2021. At that point, the U.S. Department of Agriculture (USDA) will take on all responsibilities for bringing the facility to its full operating capability and executing the NBAF mission. NBAF is expected to be operational by 2022-2023.

Mergers and Acquisitions

ABPathfinder Acquires Ensure Billing

ABPathfinder, Inc. of Overland Park acquired Ensure Billing of Phoenix in early 2016 to create Pathfinder Health Innovations Inc. ABPathfinder is a scalable, cloud-based software solution that helps therapists and educators develop assessments, daily therapy plans and progress tracking for children with behavioral health disorders, specifically autism spectrum disorders. Ensure Billing offers a platform to file insurance claims, help with scheduling, payroll, electronic files, client management and employee management for behavioral health practices. The acquisition provides a turnkey solution for clients to have all their administration processes in one package. The company, renamed Pathfinder Health Innovations, Inc, relocated in 2016 to the Crossroads district in Kansas City, MO.

Boehringer Ingelheim Acquires Merial, Offloads Vaccines to Elanco

Boehringer Ingelheim, the parent company of Boehringer Ingelheim Vetmedica, Inc. (BIVI), acquired French pharmaceutical company Sanofi's animal health subsidiary, Merial, in a swap exchanging Merial for Boehringer Ingelheim's consumer health care business. To gain approval of the deal by U.S. Federal Trade Commission regulators, Boehringer Ingelheim Vetmedica offloaded several of its portfolios. Indianapolis-based Eli Lilly and Co.'s animal health subsidiary Elanco U.S. Inc., acquired its pet vaccines portfolio for \$885 million in October 2016 and Bayer AG acquired BIVI's Cydectin anti-parasitic line in 2017. The deal, which took two years for negotiations and approvals, makes Boehringer Ingelheim the second-largest animal health company in the world, behind Zoetis. While BIVI moved its headquarters to Duluth, Georgia., where Merial was located, they increased production capacity at their St. Joseph, MO facility in 2017.

Bayer and Monsanto Merge

German-based Bayer Group's merger with US-based Monsanto was finalized with Bayer becoming the sole Monsanto shareholder in June 2018, with integration efforts launched in August 2018. The U.S. Department of Justice required divestments of certain Crop Science businesses to be finalized prior to integration. These included Bayer's field crops business,

vegetable seeds business, digital platform xarvio and certain other assets, which were divested by Bayer to BASF in August. With the integration, the name Monsanto will eventually disappear, but brand names such as Dekalb, Asgrow and Channel will remain untouched. Bayer's sale of its crop science division did not include its Kansas City manufacturing facility. Two big mergers last year already have reshaped the global seed and pesticide market: Dow Chemical's combination with DuPont last year, and China National Chemical Corp.'s acquisition of Syngenta, a Swiss seed and pesticide maker.

Bayer Announces Sale of Animal Health Division

Bayer Group announced in late November 2018 that it was evaluating available options as it plans to exit the animal health business. According to a statement released by the company, Bayer aims to strengthen its core life science businesses with a focus on core areas in pharmaceuticals, consumer health and crop science. In a company press release, Bayer stated that the company will be seeking a buyer for the animal health business in Shawnee, Kansas and will not be closing the site.

Eurofins Acquires EAG Laboratories

Eurofins Scientific, a global bioanalytical testing company, announced its acquisition of EAG Laboratories on September 18, 2017. The acquisition provides Eurofins an entry into the dynamic and growing Materials and Engineering Sciences markets, where EAG was number one in its core markets. This represents an entirely new business line for Eurofins, and provides a platform with significant organic and inorganic growth potential. EAG provides highly advanced investigative testing of organic and inorganic materials, serving a wide range of industries and differentiates itself with proprietary testing systems, software and processes. EAG has a location in Columbia, MO, acquired in the purchase of ABC Laboratories in 2015. Eurofins also acquired Lee's Summit based ViraCor-IBT Laboratories in 2014.

Kangen Pharmaceuticals Co., Ltd. Acquires KC Specialty Therapeutics

Kangen Pharmaceuticals announced an agreement with KC Specialty Therapeutics, LLC (KCST) to acquire the assets of KCST in December 2017. Kangen intends to retain operations in Kansas City, KS, with expansions in Japan and the US. KC Specialty is a US-based pharmaceutical company founded in 2012 as a subsidiary of Stason Pharmaceuticals focused on the development of quality therapeutics for niche markets, and unmet medical need such as for orphan indications. Kangen, formerly known as Stason Pharma Japan, has several ongoing projects in various stages of the FDA review process.

Huvepharma® Acquires AgriLabs

Huvepharma®, a privately owned Bulgarian global pharmaceutical company announced in early 2018 that it acquired the human and animal health firm AgriLabs, which operates a plant on the North end of St. Joseph, MO. Steve Schram, president and chief executive officer for AgriLabs, said the company will operate as a division of Huvepharma® and remain in place at its facility in St. Joseph. Both companies will continue operations under their current identities as integration opportunities are identified in 2018, according to a joint statement. Huvepharma®, established in 2000, is an animal health and nutrition company serving the animal food producing industry.

Henry Schien Spins Off Animal Health Business, Merges with Vets First Choice

Henry Schein, Inc. and Vets First Choice announced in April 2018 that Henry Schein was spinning off its Animal Health business and merging it with Vets First Choice to form a new publicly traded company. The new company, to be called Vets First Corp., will harness insights and analytics to provide pro-active prescription management, and combined with Henry Schein's leading global animal health solutions to create an animal health service and

technology platform dedicated to supporting the veterinary market. Vets First Choice, founded in 2010, is a provider of technology-enabled health care services for companion and equine veterinary practitioners. The company has a location locally in Manhattan, KS.

Ligand Pharmaceuticals Acquires Verrow Pharmaceuticals

Verrow Pharmaceuticals, developers of a technology which can prevent kidney damage caused by many popular and powerful drugs for cancer and autoimmune diseases and diagnostic imaging, was acquired by Ligand Pharmaceuticals Inc., in early 2018 for \$2 million in cash plus earnouts. Ligand is a San Diego-based company that advances pharmaceutical products through the drug development process. Dr. Vernon Rowe, a neurologist who also owns Lenexa-based Rowe Neurology Institute, created Verrow Pharmaceuticals Inc. in 2008. Ligand also acquired then Lenexa-based CyDex Pharmaceuticals Inc. for \$134 million in January 2011.

ProPharma Group acquires Drug Safety Solutions

ProPharma acquired Drug Safety Solutions, a Florida-based clinical safety services business in 2017 to allow the company to help pharmaceutical companies even earlier in drug development. The company has been active in expanding their global presence. In 2016, ProPharma Group expanded and relocated their Asia-Pacific contact center within Australia in 2016, and opened a new Medical Information contact center in Tokyo, Japan in 2017. ProPharma, founded in 2001, provides medical information and compliance services to pharmaceutical, biotechnology and medical device companies. The company was acquired by Linden Capital Partners, a Chicago-based private equity firm, in 2017.

Pivot International Acquires Avatar Engineering

Pivot International, with global headquarters in Lenexa and offices in Europe and Asia, acquired Avatar Engineering, an expert in technology design and manufacturing based in Lenexa, in May 2017. Avatar Engineering provides hardware, software and mechanical packaging solutions for OEMs in a variety of industries including the scientific instruments market and was listed in the 2015 Census. Pivot has also completed acquisitions of WideBlue, an engineering firm in Glasgow, Scotland, with expertise in digital optics and imaging technology, in April of 2018, Omaha-based Electronic Design and Manufacturing in September 2017, and Mid-Continent Custom Electronics (MCCE) and DigitTron in 2016. Pivot International has also continued to expand organically, adding staff in London, UK to support the European market, an office in Hong Kong to support the Asian market, expanded their US national sales force, and built company-owned manufacturing plants in the US and Asia. Pivot provides innovation, quality and design, engineering and manufacturing as a single-source expert serving clients in a broad range of industries, including medical and scientific products.

Quintiles Merges with IMS Health

In May 2016, IMS Health Holdings, Inc. and Quintiles Transnational Holdings Inc. announced approval of a definitive merger agreement, with the companies combined in an all-stock merger of equals transaction. At the time of the announcement, the equity market capitalization of the joined companies was more than \$17.6 billion and the enterprise value was more than \$23 billion. Among the aims of the merger, the companies aim to improve clinical trial design, recruitment and execution in the \$100 billion biopharma product development market by combining IMS Health's global information solutions with Quintiles' industry-leading product development skills. In 2017 the combined entity announced a rebrand as IQVIA. According to company spokespersons, the new name echoes the origin of the company's services as from IMS (I) and Quintiles (Q), "but it is 'VIA', the path forward that we hope to inspire and ignite real change."

Scientific Analytics Inc. Completes Acquisition of DARI Motion

Scientific Analytics Inc. (SAI) completed the asset purchase of Dynamic Athletic Research Institute, LLC (DARI/DARI Motion) in the fourth quarter of 2017. DARI Motion is a markerless motion analytics software platform that delivers validated 3D kinematic and kinetic motion analytics without sensors, markers, or force plates. The company launched a formal partnership with SAI in 2016. With noted success with helping people get ahead of small biomechanical issues before they become large, expensive problems, SAI decided to formally purchase the assets of the company.

Tyson Expands Feed Ingredient Efforts with AMPRO Acquisition

Subsidiaries of Tyson Foods Inc. announced a May 2018 agreement to buy the poultry rendering and blending assets of American Proteins Inc. and AMPRO Products Inc. AMPRO Products, a subsidiary of American Proteins, provides custom-blended protein feed products at four locations, including Corcordia, MO. The acquisition is part of Tyson's effort to expand its presence in the growing animal feed ingredient business, according to a company statement regarding the transaction.

Wilbur-Ellis Feed Acquires Ameri-Pac

In October 2018, Wilbur-Ellis Feed, LLC announced the acquisition of the assets of Ameri-Pac Inc., a family-owned, value-added manufacturing business focused on animal health and nutrition specialty products for the pet food, companion animal, livestock and aquaculture industries. Wilbur-Ellis Feed noted plans to keep Ameri-Pac's business facilities and existing employees in the St. Joseph metro area. According to the company, the acquisition strengthens Wilbur-Ellis Feed's Midwest presence and expands its premix capacity.

Xenometrics Acquired by Citoxlab Group

Xenometrics, LLC, based in Stillwell, KS announced their sale in October 2017 to a French buyer, Citoxlab Group. Founded in 2006, Xenometrics grew to about 100 employees and specialized in performing studies tied to safety pharmacology, toxicology, pharmacology and pharmacokinetics. Citoxlab is a nonclinical contract research organizations with seven facilities that employ more than 1,200 people. The company will continue to operate in Stillwell, serving as central location to the combined entity's U.S. customers. The acquisition also will help Xenometrics offer more services and expand into global markets.

Expansions and Relocations

Cerner Launches New Innovations Campus

Cerner Corporation began the move of employees to its new Innovations Campus in February 2017. The North Kansas City-based health care IT company's \$4.5 billion campus in South Kansas City, MO, is expected to bring in a grand total of 16,000 employees when completed over the next 10 years. The expansion comes on the heels of a Department of Defense contract to develop the MHS Genesis health records system, which was instrumental in Department of Veterans Affairs' choice of Cerner to replace their legacy VistA system developed 40 years ago. The two departments' EHR systems are to be integrated. The contract, awarded in May 2018, has a ceiling of \$10 billion over 10 years will bring together the VA's disparate record systems into one platform.

Bayer Announces Crop Science Facility Expansion

Bayer Crop Science LP announced a \$42.7 million expansion of its Kansas City manufacturing facility in July 2018. The expansion, expected to be completed in 2019, will consume 40,000 square feet at the property. The expansion will retain 100 jobs and could generate new ones with potential expansion in 2022, according to a development plan filed by the company.

Biomin Establishes North American Headquarters in Overland Park

Biomin America Inc., a global agricultural research company producing feed additives, established a new headquarters in Overland Park in March 2018 after moving its regional office from San Antonio. Biomin was joined by its parent, Austrian agricultural holding company Erber Group, in establishing a hub in Overland Park, KS. The move brings Biomin closer to its customers, as it develops additives for poultry, swine and cattle to reduce antibiotic use and prevent harmful mold and fungi in feed. The company noted that the local pool of animal health talent helped to drive the decision, and hired 10 employees initially.

Compass Minerals Expands Plant Science Efforts

Compass Minerals International, Inc. opened a new facility in Johnson County to research plant science in February 2018. The Overland Park-based company hired scientists from a number of disciplines, including geologists, agronomists and chemists, to develop new products in its 14,000-square-foot North American Innovation Center. The facility, located in the Midwest Bioscience Research Park in Stilwell, KS, features a 3,400 square foot greenhouse, a growth chamber and 14 acres of field trials. The innovation center currently has a staff of 12; the company plans to boost that number to 20 in 2019.

Garmin R&D Expands Efforts in Health Monitoring

Garmin International, Inc., a unit of Garmin Ltd. announced collaboration with the University of Kansas Medical Center in May 2018 with a goal of fostering innovation and increasing understanding of how wearables can assist in the detection and management of significant medical conditions. KU Medical Center research provides clinically based data that can aid in the development of algorithms capable of identifying conditions like sleep apnea and atrial fibrillation. Another research collaboration with KUMC is focused on healthy aging. Garmin Health has also announced other collaborations in 2018 with data management platform Fitabase, the Cardiogram heart health app, and an employer-sponsored, wearable device wellness program with UnitedHealthcare Motion.

Kindred Biosciences Establishes a Kansas Presence

Kindred Biosciences, Inc. announced the acquisition of manufacturing facility in Elwood, Kansas, formerly owned by Boehringer Ingelheim and by Strategic Veterinary Pharmaceuticals, Inc., in June of 2017. The purchase includes approximately 8 acres of land and two buildings encompassing approximately 180,000 square feet with clean rooms, utility, equipment, and related quality documentation suitable for small molecule and biologics manufacturing. Kindred Biosciences is a development-stage biopharmaceutical company focused on identifying compounds and targets that have already demonstrated safety and efficacy in humans and developing therapeutics based on these validated compounds and targets for dogs, cats and horses. KindredBio is headquartered in Burlingame, CA.

Likarda Doubles Space in Move to Former Marion Site

Biotech research laboratory Likarda, LLC, a leading regenerative medicine company for companion animals, creates three-dimensional cell clusters, or tiny organs, that can be used for transplants to manage diabetes in dogs and cats. The company was operating out of the Bioscience and Technology Business Center on the University of Kansas Medical Center campus. The new laboratory space in south Kansas City, in the former Marion Laboratories building doubles their space, giving the company room to scale its operations. Likarda relocated seven employees to the new space and plans to create 16 jobs as it continues to grow.

Mediware Expanding in Overland Park

Mediware Information Systems, a health software company headquartered in the region, announced in July 2018 that it would be relocating their Lenexa corporate headquarters to 66,000 square feet in the mixed-use CityPlace development in Overland Park in mid-2019. The company is growing rapidly and has made numerous acquisitions since it was acquired by Thoma Bravo for \$195 million in 2012. The company was acquired again last year by private equity fund TPG Capital and has continued to make acquisitions, the latest being Fazzi Associates, a Massachusetts-based medical coding company that also is known for consulting, education and research services. Mediware's plans to grow their local employment to 368 within the next decade — a 360 percent jump from its current employment, was key in landing them a ten-year, 50 percent property tax abatement on the move to Overland Park.

Netsmart Expands; Assumes Teva HQ Lease

Netsmart, provider of electronic health record, health information exchange, and data analytics services for behavioral health; senior living, care at home and social services communities, announced in September 2018 that they would be expanding into the building currently occupied by Teva Pharmaceuticals. As Teva consolidates their headquarters in a planned New Jersey headquarters, they will sublease the 156,000-square-foot building in Overland Park to Netsmart, who already has a presence in the area. Netsmart will begin moving employees in 2019, with plans to occupy the entire facility in 2020, and assume Teva's lease through 2028. Netsmart has grown rapidly, expanding through organic growth and acquisitions. The company closed on home health and hospice business Change Healthcare last month, adding an additional 200 employees. In 2016, Allscripts and GI Partners acquired 51 percent of Netsmart for \$950 million through a joint venture where Netsmart absorbed Allscripts' Homecare business. In August, Allscripts announced a letter of intent to sell its stake in the company, with details to be provided in the coming months.

Orion Integrated Biosciences Expands with Manhattan Location

Orion Integrated Biosciences, based in Larchmont, New York, opened a new office in Kansas State University's Research Park in mid-2016 to work more closely with Kansas State University scientists and capitalize on the future opening of the National Bio and Agro-defense Facility, or NBAF. As a biodefense company, Orion specializes in applying computer technology to manage large sets of genomic data. The company gathers, stores, integrates and analyzes data to identify patterns that can be applied to a new generation of agro-defense countermeasures. Orion's current projects are funded by the U.S. Departments of Homeland Security and Defense, and by the National Institutes of Health. The company has agreements with the Army and Navy to develop technologies that will protect military personnel deployed to environments where infectious diseases are endemic.

PBI-Gordon Relocating Corporate Headquarters to Shawnee

PBI-Gordon announced its purchase of the Shawnee Crossings office building in Shawnee, KS, in March of 2018 for a new headquarters building that will accommodate the company's growth. PBI-Gordon is a manufacturer of consumer and professional turf and landscape products, and animal health, nutrition and grooming products headquartered in the Kansas City metro area since its founding in 1947. Success in the 100 percent employee-owned manufacturer led to a search for a building to accommodate growth as the company had outgrown its Kansas City, MO location in the West Bottoms. The company expects the move to be completed by January of 2019.

PRA Health Sciences Expand in Lenexa

PRA Health Sciences announced in June of 2018 that it will build a new laboratory in Lenexa, KS. The company will expand its Kansas City-area footprint with a new, 48,000-square-foot bioanalytical lab. The new lab, expected to add 80 more jobs in the next five years, will be used to grow bioanalytical and biomarkers for small and large molecule detection in medications. It also will be able to provide quality control, pharmaceutical manufacturing and safety testing at the site. The expansion will include relocating 90 existing jobs from PRA's current location at Renner Ridge Corporate center to its new facility at Strang Line Road. PRA also plans improvements to its Lenexa location at 9755 Ridge Drive.

Purina Animal Nutrition replacing one of its facilities

Purina Animal Nutrition, in St. Joseph, MO, announced in November 2017 that it would be replacing its existing facilities with an updated 17,000 square foot animal feed manufacturing plant. The \$13.9 million project is planned for 2019 according to a spokesperson for the company. Purina Animal Nutrition's parent company is Land O'Lakes; the local facility produces a variety of lifestyle animal feeds. The company has not commented on when the project would start or how many jobs the new facility could create.

Announced Closings

EternoGen Aesthetics Relocated to Massachusetts

EternoGen Aesthetics, LLC (EA), developer and manufacturer of advanced collagen scaffolds to deliver Bio Dermal Restoration, announced the opening of new offices within the Massachusetts Medical Device Development Center (M2D2). According to the company, the new office will allow the company to be close to their manufacturing site in Massachusetts and to capitalize on the skill base that comes with the dense clustering of similar firms in the region. EternoGen was founded and initially located in Columbia, MO.

Integrated Animal Health Closes Lawrence Headquarters

Australian animal health company Integrated Animal Health after announcing it would move its global headquarters to Lawrence in April 2015 has ceased operations. City staff reported to the Lawrence City Commission in April 2018 that they understood that company was no longer operating.

Sanofi Closes and Sells its Kansas City Manufacturing Facility

French Pharmaceutical firm Sanofi closed and sold its 692,000-square-foot facility to Cerner in November 2016. According to the certificate of value, the transaction was for \$12.5 million. The 40-year-old building was one of the last facilities with a direct tie to the former Marion Laboratories, which became owned by Sanofi through a series of mergers and acquisitions. Sanofi first announced the plant would close in 2009. Cerner will include the building as part of its Realization campus which focuses on turning ideas into products.

Synexus and Radiant Research Combine Operations

Synexus and US based Radiant Research announced their full operational integration to create the world's largest site network for clinical research in May 2017. European headquartered at the time of the announcement, Synexus ran 195 sites across 11 countries and offering access to over 100 million patients in key clinical development markets. Radiant Research had 75 sites across the US. Together both companies enrolled over 10,500 patients into trails in 2016. As part of the integration, the Overland Park, KS location was closed. The company no longer has operations in the Kansas City area.

Teva Consolidating Locations in New Jersey

Israeli drugmaker Teva Pharmaceutical Industries Ltd. announced in July 2018 that it will relocate its U.S. headquarters into a planned New Jersey facility. Teva currently hosts its U.S. headquarters in the Philadelphia area and has a specialty pharmaceutical business in Overland Park. The company announced in December that it would cut 14,000 jobs and consolidate its seven U.S. locations into one main campus. In April 2018, Teva confirmed it sold AssistRx, Inc. its patient services and solutions segment, which provided on-call nurses and support for patients using Teva's specialty products, such as treatments for multiple sclerosis and Parkinson's disease. AssistRx announced a takeover of a portion of Teva's Overland Park offices and plans to hire roughly 200 of Teva's employees.

Life Sciences Capital

Access to capital is a critical factor in company formation and growth, especially in the life sciences where the path to profitability can be long and uncertain. Nationally, PricewaterhouseCooper's (PwC) Money Tree 3rd Quarter 2018 report notes that investment capital funding has grown steadily through the last 8 quarters, reaching a quarterly funding record, with \$27.5 billion invested in VC-backed startups and 55 mega-rounds. Conversely, VC-backed deal volume is down to a level not seen since Q4 of 2012.

The US State Science and Technology Institute (SSTI) analyzes NVCA-Pitchbook Venture Capital Monitor data, and reports a similar trend: fewer deals, but larger funding amounts. SSTI analysis looked at accelerator/incubator, angel, and seed funding rounds through the 3rd quarter of 2018, and noted overall declines in early stage funding. Nationally, all pre-VC financings are down 28 percent in the first three quarters of 2018 compared to the first three quarters of 2017. Accelerator and incubator deals have particularly fallen off (down 42%) and activity has also slowed for angel and seed investors. While Missouri activity has also declined over the same period, Kansas deal value has risen. In total activity, both states' activity is dwarfed by Midwest rivals Texas and Colorado, and the Midwest is dwarfed overall by California, which benefits from 65-70% of the deals and funding value in the US. SSTI cautions that 2018 data at this point could change, as early stage deals are the most likely to be reported late or not at all.

Table 3: SSTI Analysis of Early Stage Funding

Deal Type	All Industries Pre-VC Investment					
	2017 (Quarters 1-3)		2018 (Quarters 1-3)		Y/Y Growth	
Year	Deal Count	Value (mm)	Deal Count	Value (mm)	Deal Count	Value
Kansas	16	\$19.9	11	\$27.3	-31%	37%
Missouri	57	\$47.8	45	\$29.5	-21%	-38%
Texas	387	\$264.7	342	\$318.2	-12%	20%
Colorado	236	\$225.1	146	\$141.8	-38%	-37%
California	2,048	\$2,167.8	1,342	\$2,057.7	-34%	-5%
U.S. Total	6,521	\$6,411.9	4,675	\$5,972.3	-28%	-7%

Source: SSTI analysis of PitchBook data

Both SSTI and PwC findings highlight the long-standing trend that the U.S. venture capital (VC) market remains concentrated on the coasts with nearly three-quarters of total deals and nearly 88 percent of VC dollars going to the West Coast states, the Mid-Atlantic states, and the New England states.

Regional and community leaders, including BioNexus KC, have promoted access to capital as a critical need for early stage and high growth companies in the region for the last decade. These efforts have led to increasing local investor participation in venture funding. According to KC SourceLink’s *We Create KC* report published in April 2018, the number of local investors in the area has outpaced investors from outside the region from 2015 to 2017. The report also noted that nearly half of the region’s capital sources for early stage companies are new since 2013.

KC SourceLink analyzed investment activity for companies in the Life Sciences/Health Care space both within a 150-mile radius of downtown Kansas City, as well as nationally. Life Sciences companies included those classified as Biotechnology, Disease Diagnosis, Drug Delivery, Drug Development, Drug Discovery, Drug Manufacturing, Medical Devices & Equipment, and Medical Information. The data indicates that the region lags Midwest states with technology hubs such as Texas and Colorado, and that the Midwest region lags California by a significant margin.

Table 4: Local and National Life Science Venture Capital Funding

Deal Type	Life Sciences Investment					
	2015		2016		2017	
Year						
Region	Deal Count	Value (mm)	Deal Count	Value (mm)	Deal Count	Value (mm)
KC Metro Region*	7	\$5.7	7	\$3.3	5	\$2.9
Missouri	34	\$118.3	16	\$159.5	17	\$61.1
Kansas	6	\$4.7	8	\$3.6	6	\$2.1
Texas	73	\$386.3	80	\$374.5	75	\$299.0
Colorado	34	\$186.0	39	\$186.3	51	\$332.3
California	448	\$5,820.0	418	\$5,330.0	484	\$8,260.0
U.S. Total	1,551	\$14,800	4,675	\$13,700	2,780	\$28,300

* Within 150 Miles of 64108

Source: KCSourceLink

It should be noted that smaller funding transactions are not always captured in the funding databases that track venture funding in the United States. The above data may not include early stage funding from private or angel sources. Despite the relatively few noted transactions in the region, the number and kinds of funding resources in the region is expanding.

The 2015 Census report detailed 10 formal capital sources active in the life sciences in the region. The list has grown since 2015 to 17 capital sources, listed below, that have invested in, or have investment criteria that include life sciences companies in the Census region.

BioNovus Innovations

BioNovus Innovations, LLC was established in August, 2015 by a group of local investors to focus on development of innovations emanating from the University of Kansas Institute for Advancing Medical Innovation. Investment focus includes drugs, devices, diagnostics, data and health care delivery models.

Dundee Venture Capital

Headquartered in Omaha with offices in Chicago and Minneapolis, Dundee Venture Capital (DVC) invests in seed stage startups between the East and West coasts and Canada. Dundee has invested locally in healthcare technology firm Pathfinder Health Innovations.

Firebrand Ventures

Kansas City based Firebrand Ventures invests in early stage startups in the greater Midwest, from Austin to Minneapolis, Boulder to Columbus. The venture capital fund closed its \$17.7 million seed fund, which was oversubscribed by about 250 percent, in April 2018. Firebrand has made 12 investments to date, 11 of which are either headquartered in their defined Greater Midwest territory or will have a significant presence there, including life sciences companies FitBark and Sickweather.

Flyover Capital

Flyover Capital was formed to invest in early-stage technology companies to create the next generation of technology success stories in 'flyover' region. Headquartered in Leawood, Kansas, Flyover Capital, founded in 2014, has invested in 12 Midwest-based companies. Five of those companies are based in or with a significant presence in the Kansas City area, including medical device company Innara Health in a Series B round offering in 2015.

Fulcrum Global Capital

Fulcrum Global Capital invests in innovative and promising agriculture (including agtech) and animal health companies that capitalize on the compelling market opportunities driven by the explosive growth of the global population and the resulting strain on the food supply. Fulcrum seeks to bring value beyond capital through industry expertise and strategic partners to early stage companies. Based in Kansas City, the fund launched in 2017, and has closed on two investments to date, both outside of the region.

iiM, LLC

iiM: Innovation in Motion invests in seed stage companies where the founder has personally invested in the company; raised some money from friends and family; and has a plan for how to scale the company. The fund focuses on companies, mostly in the Midwest, in animal health, human health or agribusiness. Regional life science portfolio companies to date are Mobility Designed and Mazen Animal Health.

KCRise Fund

KCRise Fund is a co-investment fund which invests with institutional venture capital investors in early stage companies based in the Greater Kansas City area. Launched in 2016 in conjunction with the regional KC Rising economic initiative, the \$19 million KCRise Fund has 15 companies in its portfolio, including healthcare technology firm Bardavon Health Innovations.

Open Air Equity Partners

OpenAir Equity Partners is a venture capital firm solely focused on the wireless communications and mobile Internet sectors. Founded in 2008 in Kansas City, the investment team is comprised of wireless pioneers and experts who invest only in that market sector where experience, knowledge, industry contacts, and ability to navigate through the complex wireless and communications ecosystem will power ventures and companies to success.

Open Prairie Ventures

Open Prairie, headquartered in Effingham, IL was founded in 1999 as a venture capital firm focused on Midwest-based technology companies. Since its initial founding, Open Prairie has

managed three funds and over \$100M in investments with a strong focus on agriculture technology and medical devices. Open Prairie has invested in local companies Metactive, Flow Forward Medical and Innara Health.

Royal Street Ventures

Royal Street Ventures, an investment fund focused on entrepreneurship, was created out of the Royal Street Innovation and Investment Corporation in 2015. The company is headquartered in Park City, Utah. In 2016, Royal Street announced the launch of a \$25 million fund targeting early-stage startups from the Midwestern and Western United States, and the opening of a Kansas City office.

Technology Accelerator Partners, LLC

Technology Accelerator Partners LLC, or TechAccel, is a technology and venture development enterprise in the agriculture and animal health sector founded in 2014 by Michael Helmstetter, Kansas State University and the Bicknell Family Holding Company. TechAccel was the first private capital, technology co-development partner in these sectors, injecting capital and providing world-class research through its relationships with universities. In 2017, it announced a partnership with the Donald Danforth Plant Science Center in St. Louis to award grants to help drive agricultural innovations to market. TechAccel announced a novel partnership with Reliance Animal Health Partners in August 2018 to focus exclusively on bringing animal health innovations to market under the name of Covenant Animal Health Partners.

Angel Capital and Pre-Seed Stage Funding

Angel Capital Group

The Angel Capital Group is a national Angel investing organization specializing in funding companies with unique products or services in large opportunity markets typically needing \$300,000 - \$1,000,000 in capitalization. The first chapters of the group were in Nashville and Knoxville, Tennessee, but the group has a chapter in the Kansas City Region. Since 2008, the Group has invested \$48 million in 140 companies nationwide. Regional companies funded include Innara Health, TVAX Biomedical, and ABPathfinder.

Digital Sandbox KC

Digital Sandbox KC provides proof-of-concept resources including market validation, prototyping and beta testing support for development of digital technologies within new and existing businesses. Life sciences companies HeartToHeart Network, PatientsVoices, pHLOGISTIX, TeraCrunch, and Zorilla Research have received early stage support from Digital Sandbox.

LaunchKC

LaunchKC is designed to attract tech entrepreneurs locally, regionally and nationally to apply and compete for grant funding to launch their business. Since 2015, LaunchKC has awarded \$1.5 million in cash grants to 20 startup businesses willing to call Downtown Kansas City home. Life sciences companies iShare Medical, Mobility Designed and Sickweather have been a part of the LaunchKC grants program.

Mid-America Angels

Founded in 2006, Mid-America Angels (“MAA”) is a regional network of accredited investors dedicated to identifying and funding the most promising early stage companies in the Kansas-Missouri region. The MAA network funds deals in the investment range of \$250,000 to \$1,500,000. MAA typically participates in seed, Series A and Series B rounds. Depending on the size of the capital raise, MAA can either lead the round or be part of the investment

syndicate. Life science companies funded included Aratana Therapeutics, Flow Forward Medical, Metactive Medical, and TVAX Biomedical.

Northland Angel Investor Network

Northland Angel Investor Network (NAIN) works with the Clay County Economic Development Council to match financial capital and assistance with qualified companies willing to locate in Clay County, Missouri.

Women's Capital Connection

Women's Capital Connection (WCC) is a regional network of accredited angel investors dedicated to identifying and funding the most promising start-up business opportunities in the region. Fourteen companies have received funding, with over \$2.2 million dollars contributed to the region since 2008.

Incubators, Accelerators, and New Business Facilities

Business incubation catalyzes the process of starting and growing companies, providing entrepreneurs with the expertise, networks and tools they need to make their ventures successful. Incubation programs diversify economies, commercialize technologies, create jobs and build wealth.

An incubator's main goal is to produce successful firms that graduate from the program as financially viable and freestanding businesses. These incubator "graduates" create jobs, revitalize neighborhoods, commercialize critical new technologies and strengthen local and national economies.

Critical to the general definition of an incubator is on-site management, which develops and orchestrates business, marketing and management resources tailored to a company's needs. Incubators usually also provide clients access to appropriate rental space and flexible leases, shared basic office services and equipment, technology support services, and assistance in obtaining the financing necessary for company growth.

The term 'incubator' has expanded over time to include facilities that include formal company development programs both with and without permanent physical space for companies to locate. The following list provides an overview of the resources available to fledgling life sciences companies in the region.

Betablox

BetaBlox is a business incubator that can increase an entrepreneur's likelihood of success by more than twice the national average. Betablox awards 10 entrepreneurs at a time with a package designed to accelerate a startup's growth and increase its valuation. In exchange, the Betablox team joins the founding team by taking a small piece of equity instead of charging upfront cash. This mutually aligns the Betablox team with that of the founding team. Since its inception in 2012, the incubator has helped several hundred companies get off the ground, and their combined revenues have more than doubled, annually.

Biomedical Devices of Kansas Medical Device Park

Biomedical Devices of Kansas (BMDK) is a business accelerator for the medical device or pharmaceutical company that is ready to graduate or has graduated from an existing incubator or is in need of a facility which offers an FDA and ISO 13485-approved facility and quality management systems that can be licensed to BMDK clients. This unique offering helps clients save time, money and reduce the time to market. The accelerator offers an ISO class 8 – ISO

class 5 clean spaces, including aseptic, analytical lab space and production space. BMDK teams with local and international professionals, and academia to offer not only complete design and development support but also regulatory support and submissions and management of clinical trials. The accelerator is strategically located 30 minutes from downtown Kansas City in the heart of the bioscience corridor, offering technology, convenience and value.

Bioscience & Technology Business Center (BTBC) Main Facility

The BTBC Main Facility, which opened in 2010, is a 51,400 square foot facility located on the University of Kansas (KU) West Campus in Lawrence, Kansas. The BTBC provides wet lab and office space, and professional business services to emerging bioscience and technology companies, spinouts from the University of Kansas, KU research collaborations, and established companies benefiting from close proximity to university assets. The BTBC is a unique partnership between the City of Lawrence, Douglas County, KU, and the Lawrence Chamber of Commerce.

Bioscience & Technology Business Center (BTBC) – KUMC Facility

The BTBC-KUMC Facility is located on the Kansas University Medical Center Campus in Kansas City, Kansas. The building is comprised of 20,000 square feet of office and wet lab space adjacent to the KUMC Hospital. It houses emerging bioscience and technology startups, university startups and collaborations, and companies seeking to locate close to resources at the KUMC Hospital.

Bloch Venture Hub

Located just north of the Country Club Plaza, the Bloch Venture Hub is powered by the resources of Country Club Bank and the Regnier Institute for Entrepreneurship and Innovation at UMKC's Henry W. Bloch School of Management. The facility's unique three-story layout offers entrepreneurs a place to meet with mentors, attend educational programming, access start-up resources and engage with peers and industry experts.

Christopher S. "Kit" Bond Science and Technology Incubator

The 25,000 square foot wet laboratory incubator is located at Missouri Western State University (MWSU) and operated by the Institute for Industrial and Applied Life Sciences, DBA Innovation Stockyard, an independent 501(c)(3) organization, under a long term management agreement as a state-affiliated Innovation Center. The incubator has a primary focus on animal health and nutrition start-up companies, seeking to leverage St. Joseph's long history in this sector and the facility's central location within the Animal Health Corridor. Innovation Stockyard-Driving ideas to Market.

Dean L. Hubbard Center for Innovation

The Hubbard Center, opened in 2009, is a 47,000-square-foot building housing Northwest Missouri State University's School of Agricultural Sciences as well as natural sciences programming related to nanoscale science and chemistry. In addition to lecture halls and staff offices, the building offers state-of-the-art soils and research laboratories.

Enterprise Center of Johnson County

The Enterprise Center in Johnson County is a non-profit organization that connects entrepreneurs with the resources they need to grow and scale by providing education, mentoring, coworking space and connections to capital through the Mid-America Angels investment network and the Fountain Innovation Fund. Since it was founded in 1994, ECJC-assisted companies have had a 3.2 billion impact on the regional economy.

Independence Regional Ennovation Center

The Independence Regional Ennovation Center (“Ennovation Center”) is a mixed-use business incubator which focuses on three core areas for the development of new businesses in the biotechnology, kitchen/culinary, and business technology sectors. The 28,000 square foot facility opened in late 2010 as part of the renovation of the former Independence Regional Health Center (IHRC) on Truman Road. The center includes office space, collaborative office suites, work stations, common areas, and four laboratories of varying sizes (600 to 1200 square feet). In addition to the business technologies and life sciences-focused wet laboratory incubator, the Ennovation Center also houses a culinary business incubator equipped with five commercial kitchens. Upon date of publication the Ennovation Center is home to over 55 developing and operating companies.

Manhattan-Kansas State Innovation Center

The Innovation Center is a 30,000 square foot wet laboratory incubator on the Kansas State University campus and managed by K-State's Institute for Commercialization. Separately, the City of Manhattan owns the Kansas Entrepreneurial Center, a 6,000 square foot wet lab incubator facility for emerging bioscience and manufacturing companies, as well as those using university and research technologies in collaboration with Kansas State University. This facility was renovated by the KEC partnership which consists of the City of Manhattan, the Manhattan Area Chamber of Commerce, the Pottawatomie County Economic Development Corporation, KSU-IC and the North Central Kansas Regional Planning Commission (Beloit, KS). The facility is managed by the Manhattan Area Chamber of Commerce for the City of Manhattan.

K-State Office and Research Parks

The Kansas State University Foundation owns 56-acres of developable land on the north edge of the Kansas State University Campus and adjacent to the National Bio & Agro-defense Facility. Multiple lab and office buildings have been developed in the parks. The first phase of the office park, a 60,000 square-foot building on the northwest corner of Kimball and Denison avenues, was completed in October 2015. The KSU Foundation occupies two-thirds of the new building, with the remainder leased to seven corporate tenants. The second of four 60,000 square-foot office buildings — phase two of the project (1880 Kimball), is 38 percent pre-leased and is expected to be complete in Fall 2018.

MU Life Science Business Incubator at Monsanto Place

This 33,000 square foot wet laboratory facility opened in 2009 in Columbia, Missouri and is currently home to 30 biomedical, animal health, technology and Internet/software ventures. These companies participate in the technology commercialization program offered by the Missouri Innovation Center. Seventeen of the resident companies are University of Missouri spin-off companies; the incubator also recruits both domestic and international companies to the region. As a result, The International Business Innovation Association (InBIA) designated the incubator an International Soft Landings Incubator, offering specialized programs for non-domestic startups entering the US market, and is one of only eighteen such incubators in the US. The incubator facility is owned by the University of Missouri and managed by the Missouri Innovation Center, an independent, non-profit organization focused on the translation of research innovations into technologies, products, processes, and new ventures that benefit society.

Sprint Accelerator

The Sprint Accelerator is the hub for corporate innovation and entrepreneurial engagement. Sprint Accelerator delivers year-round programming, including the 90+ Corporate Accelerator, 6-month Mentor Network, STEM programs, entrepreneurial community collaboration, and

coworking space. The Corporate Accelerator program is a three-month, immersive, mentorship-driven startup accelerator based in Kansas City, Missouri. In 2017, the Sprint Accelerator joined with the Sprint and the Dairy Farmers of America to increase collaboration among corporations and startups. Selecting startup companies that align with each corporation’s strategic goals gives the corporations access to innovative products and services. Each startup selected for the program receives resources from program corporate sponsors. Sprint opened the award-winning Sprint Accelerator in the Crossroads Arts District of Kansas City in 2014.

UMKC Innovation Center

From whiteboard to boardroom, the UMKC Innovation Center partners with the university and the community to spark entrepreneurial efforts within our region and across the country. With a suite of high-impact programs, the center helps emerging and existing business owners, whether they are students, faculty or community members, hone their business basics, evaluate commercialization opportunities and connect with the right resources at the right time. Key programs include UMKC Small Business and Technology Development Center; Whiteboard2Boardroom, a partnership between 23 regional research institutions that works with entrepreneurs to move innovative technologies to market; Digital Sandbox KC, a proof of concept center for digital innovations; ScaleUP! Kansas City, a program funded by the U.S. SBA that helps already successful businesses aim for their first million in revenue; and KCSourceLink a network of 240+ organizations that provide assistance and capital to growing companies.

Universities

University and Hospital Research Centers were not included as life sciences companies due to the academic nature of their research activities; however, they represent critical centers of discovery and innovation that feed into the regional life sciences industry. Moreover, they employ a significant number of life sciences workers in addition to the data published in the current study. Due to the broad range of position classifications within these institutions, this Census makes no employment estimates of those associated with life sciences research and development. The region is home to 131 University and Hospital Research Centers actively contributing to the intellectual capital and research base of the life sciences industry. (Table 5)

Table 5: University Research Centers

<i>University Research Centers</i>
<i>Children’s Mercy Hospital & Clinics</i>
Children’s Research Institute
-Center for Clinical Effectiveness
-Center for Data Science
-Center for Health Services and Outcomes Research
-Center for Innovation in Healthcare Delivery
-Center for Pediatric Genomic Medicine
-Center for Pediatric Precision Therapeutics
Biostatistics and Epidemiology Core
Center for Bioethics
Center for Children’s Healthy Lifestyles and Nutrition
Center for Pediatric Cancer Research
Center for Perinatal Research
Ward Family Heart Center

<i>University Research Centers</i>
<i>University of Kansas</i>
Advanced Computing Facility
Biodiversity Institute
Center for Environmentally Beneficial Catalysis
Higuchi Biosciences Center
-Cancer/Molecular Biology/Developmental Biology
-Chemical Biology and Drug Design
-Drug Metabolism, Toxicity and Pharmacogenomics
-Infectious Diseases and Vaccine Discovery
-Neuroscience and Neurodegenerative Diseases
-Protein Structure and Function
Information & Telecommunication Technology Center
Institute of Bioengineering Research
Kansas Biological Survey
Kansas Vaccine Institute
Schiefelbusch Institute for Life Span Studies
-Beach Center on Disability
-Biobehavioral Neurosciences in Communication Disorders Center
-Center for Community Health and Development
-Center for Research on Learning
-Kansas Center for Autism Research and Training
-Kansas Intellectual and Developmental Disabilities Research Center
-Kansas University Center on Developmental Disabilities
NIH Chemical Methodologies
NIH Specialized Chemistry and Library Development Center of Excellence
<i>Kansas University Medical Center</i>
Center for Advancing Latino Health
Center for American Indian Community Health
Center for Children's Healthy Lifestyles and Nutrition
Center for Epigenetics and Stem Cell Biology
Center for Healthcare Informatics
Center for Outcomes Research & Education
Center for Telemedicine & Telehealth
Center for Viral Pathogenesis
Frontiers: University of Kansas Clinical and Translational Science Institute
Hoglund Brain Imaging Center
Institute for Advancing Medical Innovation
Institute for Neurological Discoveries
Institute for Reproductive Health and Regenerative Medicine
-Center for Perinatal Research
-Center for Reproductive Sciences

<i>University Research Centers</i>
<i>Kansas University Medical Center</i>
Kansas IDeA Network of Biomedical Research Excellence
Kansas Intellectual and Developmental Disabilities Research Center
Kidney Institute
KU Alzheimer's Disease Center
KU Clinical Research Center
KU Diabetes Institute
Landon Center on Aging
Liver Center
Midwest Stem Cell Center
Polycystic Kidney Disease Center
Program in Integrative Medicine
University of Kansas Cancer Center
<i>Kansas State University</i>
Beef Cattle Institute
Biosecurity Research Institute - BRI
Biotechnology Core Facility
Bulk Solids Innovation Center
Center for Genomic Studies on Arthropods Affecting Human, Animal, and Plant Health
Center for Outcomes Research and Epidemiology
Center for STEM Education
Center of Excellence for Emerging and Zoonotic Animal Diseases
Center of Excellence for Vector-Borne Diseases
Center of Excellence for Translational and Comparative Oncology Research
Center on Aging
Ecological Genomics institute
Food Innovation Accelerator
Food Science Institute
Institute for Environmental Research
Institute of Computational Comparative Medicine
Johnson Cancer Research Center
K-State Olathe Innovation Accelerator
Kansas Cooperative Fish and Wildlife Research Unit
Kansas Lipidomics Research Center
Konza Prairie Biological Station
KSU Bioinformatics Center
KSU Herbarium
Midwest Institute for Comparative Stem Cell Biology
Nanotechnology Innovation Center of Kansas State
Sensory Analysis Center
US-China Center for Animal Health

University Research Centers
University of Missouri – Columbia
Center for Agroforestry
Center for Applied Research and Environmental Systems (CARES)
Center for Health Care Quality
Christopher S. Bond Life Sciences Center
Dalton Cardiovascular Research Center
Ellis Fischel Cancer Center (clinical trials)
Health Activity Center
Grape and Wine Institute
Health and Behavior Risk Research Center
Informatics Institute
Institute for Clinical and Translational Science
Interdisciplinary Center on Aging
Interdisciplinary Plant Group
International Institute of Nano and Molecular Medicine
Laboratory for Infectious Disease Research (BSL3-level laboratory)
Missouri Innovation Center
MU Research Reactor (MURR)
Mutant Mouse Regional Resource Center (NIH)
National Center for Gender Physiology
National Center for Soybean Biotechnology
National Swine Resource and Research Center (NIH)
Rat Resource and Research Center (NIH)
Research Center for Human-Animal Interactions
Thompson Center for Autism and Neurodevelopmental Disorders
University of Missouri Bioinformatics Consortium (UMBC)
University of Missouri – Kansas City
Center for Aging Studies
Center for Applied Environmental Research
Center for Economic Information
Center for Health Insights
Center of Excellence in the Study of Dental and Musculoskeletal Tissues
Institute for Human Development
National Center of Excellence in Women's Health
Shock Trauma Research Center
Vision Research Center
Saint Luke's Hospital
Saint Luke's Neuroscience Institute
Saint Luke's Cancer Institute
Saint Luke's Mid America Heart Institute

<i>University Research Centers</i>	
<i>Kansas City University of Medicine and Biosciences</i>	
Center for Clinical Competence	
Score 1 for Health	

Hospitals

Hospitals are not listed as life sciences companies in this report. However, their role in conducting clinical trials is a critical part of the overall life sciences research effort. Twenty-five hospitals or health systems in the region were listed as clinical trial sites on the clinical trials registry run by the United States National Library of Medicine at the National Institutes of Health.

Table 6: Hospitals Conducting Clinical Research

<i>Hospitals Conducting Clinical Research</i>			
<i>Hospital</i>	<i>City</i>	<i>ST</i>	<i>County</i>
Cancer Center of Kansas-Manhattan	Manhattan	KS	Riley
Centerpoint Medical Center, LLC	Independence	MO	Jackson
Children's Mercy Hospital & Clinics	Kansas City	MO	Jackson
Ellis Fischel Cancer Center	Columbia	MO	Boone
Harry S Truman Veterans Memorial Hospital	Columbia	MO	Boone
Heartland Regional Medical Center	St. Joseph	MO	Buchanan
Kansas City Veterans Affairs Medical Center	Kansas City	MO	Jackson
Lawrence Memorial Hospital	Lawrence	KS	Douglas
Menorah Medical Center	Overland Park	KS	Johnson
Minimally Invasive Surgery Hospital	Lenexa	KS	Johnson
North Kansas City Hospital	Kansas City	MO	Jackson
Olathe Medical Center	Olathe	KS	Johnson
Providence Medical Center	Kansas City	KS	Wyandotte
Research Medical Center	Kansas City	MO	Jackson
Saint Francis Hospital and Medical Center	Topeka	KS	Shawnee
Saint Luke's South Hospital	Overland Park	KS	Johnson
Shawnee Mission Medical Center	Overland Park	KS	Johnson
St. Joseph Medical Center	Kansas City	MO	Jackson
Saint Luke's Health System	Kansas City	MO	Jackson
Stormont-Vail Regional Health Center	Topeka	KS	Shawnee
The University of Kansas Cancer Center	Kansas City	KS	Wyandotte
Truman Medical Center	Kansas City	MO	Jackson
University of Kansas Health System	Kansas City	KS	Wyandotte
University of Missouri Health System	Columbia	MO	Boone
VA Eastern Kansas Health Care	Leavenworth	KS	Leavenworth

Source: ClinicalTrials.gov

Analysis

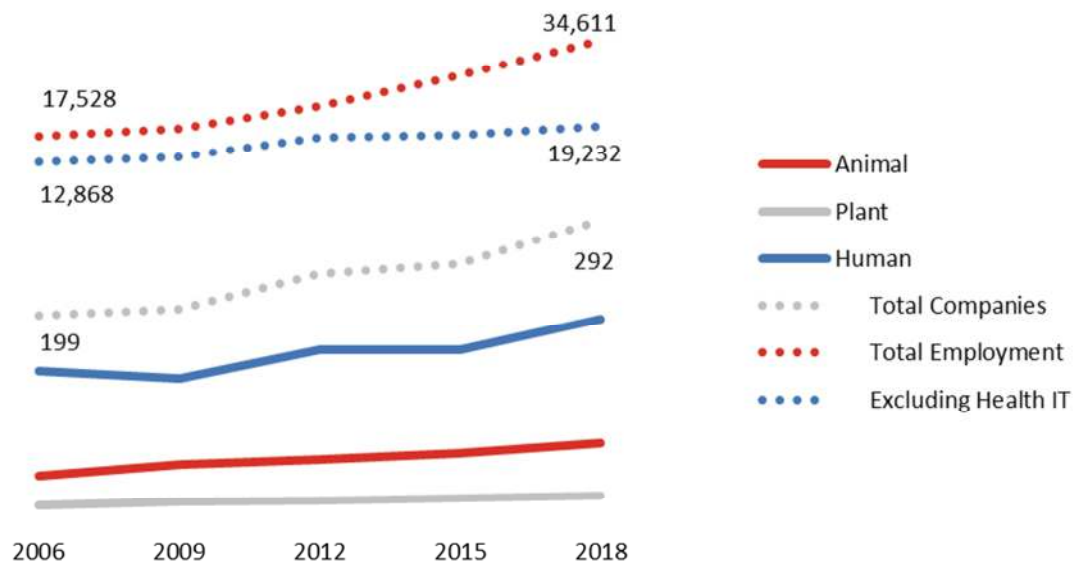
The total number of life sciences companies in the region has grown by nearly 17% since the 2015 Census, from 250 companies in 2015, to 292 companies. Employment gains also have been solid with a 22% increase since 2015. Companies with a primary research focus on human health represent two-thirds of the industry and three quarters of employment.

Table 7: Life Science Industry Focus

Focus	# of Companies	%	Employment	%
Human	196	67%	26,200	76%
Animal	74	25%	5,425	16%
Plant	22	8%	2,986	9%
Total Companies	292		34,611	

The proportional representation of the industry has changed little since 2015, when 66% of companies had a primary focus on human health, and 74% of overall employment. Animal health research focused companies have gained prominence over the 12 years of Census reporting rising from 21% of the region's companies in 2006 to 25% in 2018. Plant science focused companies have represented 6% to 8% of the total companies since 2006.

Figure 2: Life Sciences Industry Focus over Time



All companies:	2006	2009	2012	2015	2018
Human	145	137	166	166	196
Animal	42	53	58	64	74
Plant	12	16	16	20	22
Total Companies	199	206	240	250	292
Total Employment	17,528	18,836	22,865	28,269	34,612
Excluding Health IT	12,868	13,911	17,337	17,872	19,233

The overall presence and employment of life sciences companies has increased steadily over time. Although a significant portion of the employment growth can be attributed to the growth of the Health IT sector, led by Cerner’s expansion in the region, overall employment and company presence has also been noted throughout the industry in the region. (Figure 2)

Company Changes Over Previous Census Reports

A review of the Census company lists since 2006 reveals industry changes over the last 12 years. Since 2006, 111 companies remain on the list as life sciences companies in the Census region. Some have changed names over the years, due to mergers, acquisitions, or rebranding efforts, but have remained in the region.

Table 8: Changes to the List over Time

<i>Companies Over Time</i>	<i>2006</i>	<i>2009</i>	<i>2012</i>	<i>2015</i>	<i>2018</i>
Total Companies	199	206	240	250	292
Net Increase from Previous Census		7	34	10	42
Companies New to the List		45	65	65	71
Companies from Previous Census Removed		38	31	55	29
Companies still in the region in 2018 from this year	111	137	171	221	

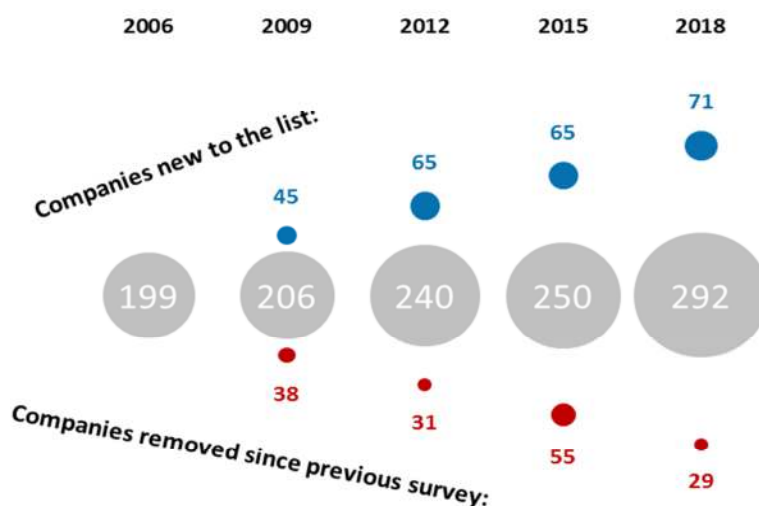
The Appendix section of the report lists the companies still in the region from each of the Census periods. While some of the companies may have been in the region for longer than listed, the list notes their presence in the year they were identified in the process of compiling the report. While the identification process is very thorough, it is still possible that a company may be missed.

Companies are removed from previous Census lists due to various reasons:

- Company has been confirmed as closed, or no current information can be located about the company
- Company has relocated out of the Census region
- Company merges with or is acquired by another company located in the region
- Company merges with or is acquired by a company, and the location in the region is subsequently closed or relocated
- Company response to a Census outreach indicates that their activities no longer fit with the life sciences definition
- Several physician practices who were included due to research efforts and/or clinical trials have been acquired by hospital systems

In the 2009 Census, the life sciences definition criteria was amended slightly to exclude hospitals and university centers from the list of census companies. The 2006 Census included a small number of hospitals and university centers in the region. The 2009 and newer Census reports include such entities in report headings outside of the company list.

Figure 3: Life Sciences Company List: Changes over Time



The 2018 list of 292 life sciences companies in the region includes 71 companies not listed in 2015. Companies new to the list include:

- Companies that were started in the 3 years since the last census,
- Companies that located into the region,
- Companies that may have been overlooked in previous Census efforts, and
- Companies whose activities expanded into life sciences research since the last Census.

For example, Garmin’s collaborative efforts in healthcare monitoring with the University of Kansas medical center researchers placed the company in the medical device category in this year’s Census.

The most striking trend is the increase of new companies in the Health IT space, which is driven by increasing focus on technology and data analysis in the health care market. Despite the addition of 71 companies to the list, the overall company total was also impacted by the removal of 29 companies from the list, resulting in a net increase of 42 companies since 2015.

Table 9: Companies New to the List

Industry Segment	Companies Added Since the Previous Census			
	2009	2012	2015	2018
Biotechnology Research and Testing	11	22	22	12
Drugs and Pharmaceuticals	13	13	15	18
Food Science/Feed or Plant-Based Products	5	5	4	8
Health IT	1	5	10	19
Medical Device Firms	15	19	12	12
Organic or Agricultural Chemicals	0	1	2	2
Total Number of Companies	45	65	65	71

Of the 221 companies who were reported in the 2015 Census, and are still listed in the region in 2018, 17 have changed names since the last Census report. For example, The Altasciences Group of Quebec acquired Vince & Associates Clinical Research in 2013 but has been using ‘Vince & Associates Clinical Research, an Altasciences company’ in press releases, so the

name was changed to reflect this. Some are rebranding efforts, such as Del Monte Food’s pet business rebranding as Big Heart Pet Brands or American Proteins change to AMPRO Products. Others are the result of mergers or acquisitions, such as IMS Health and Quintiles’ 2016 merger that led to a rebranding as IQVIA. (Table 10)

Table 10: Companies with Name Changes 2015-2018

Company Name in 2018	Company Name in 2015
Altasciences Clinical Research	Vince & Associates
AMPRO Products	American Proteins, Inc.
Big Heart Pet Brands	Del Monte Pet Products
Catalent Pharma Solutions	Catalent Cts, Inc.
CIA Labs	Paradox, Inc.
Eir Pharmaceuticals	Zorilla Research
ENDOVAC Animal Health	IMMVAC
Excite Pharma Services	Certified Energy/Environmental Labs, LLC
IntelligeneDX	IntelligeneCG
IQVIA	Quintiles
Johnson County Clintrials, LLC	Johnson County Clinical Trials
MGP Ingredients, Inc.	MGPI Processing, Inc.
Phoenix Medical Research	CTT Research
SCD Probiotics	Biosyntropy Solutions, LLC
Schroer Manufacturing Company	Shor-Line
TCI Peptide Therapeutics	Tensive Controls
Viracor Eurofins	Viracor-IBT Laboratories, Inc.

Fourteen companies in the region have been part of a merger or acquired since the 2015 Census. While there is some duplication with the above (Table 10), the following list includes all transactions that closed in the last three years and may not have resulted in a name change as of the publication of this report.

Table 11: Companies Merged or Acquired 2015-2018

Merged with or Acquired by another company; still in the region	
Acquired/Merged	Purchaser
AgriLabs	Huvepharma
Ameri-Pac, Inc.	Wilbur-Ellis Feed
AMPRO Products	Tyson
Bayer Group	Monsanto
DARI	Scientific Analytics Inc.
EAG Laboratories	Eurofins
MidAmerica Neuroscience Research Foundation	Rowe Neurology Institute
Quintiles	IMS Health Holdings, Inc. (now IQVIA)
ViraCor-IBT Laboratories, Inc.	ViraCor Eurofins

<i>Merged with or Acquired by another company; removed from the list</i>	
Avatar Engineering, Inc.	Pivot International, Inc.
KCGI	HCA
Radiant Clinical Research, Inc.	Synexus, closed location
St Joseph Oncology Inc.	Mosaic Life Care
Verrow Pharmaceuticals Inc.	Ligand, moved to San Diego

Four companies have been acquired by companies in the region. KCGI and St. Joseph Oncology are now part of the region's larger Hospitals or Health Systems, so were removed from the individual company list. Mid-America Neuroscience Research Foundation has joined with Rowe Neurology Institute, and Pivot International, Inc. headquartered in Lenexa, KS, acquired Avatar Engineering, also located in Lenexa. (Table 11)

From 2015 to 2018, 24 companies were dropped from the list due to relocation, closure, or inability to locate current information regarding the company's operating status, such as mail returned, website down, and/or phone number disconnected. Of the 29 total companies removed from the list, eight relocated from the region, and three were branch locations who left the region.

Table 12: Companies with No Information/Moved From the Region

<i>Closed, no information or no longer operating in the region</i>	
Company Name	Status
AgBiTech	Now in Fort Worth, TX
Avacta Animal Health	Closing to start a new business
Axenic Biomedical, LLC	Closed
Biova	KS Location closed
Clinipace, Inc.	Closed
EternoGen Aesthetics	Now in Boston, MA
Foresite Healthcare	Now in St. Louis
IGXBio	Closed
Innervo Technology, LLC	Now in Chicago, IL
Integrated Animal Health	KS Location closed
Intellispeak, LLC	Closed
International Clinical Research Institute, Inc.	Closed
Ligand Pharma	Now in San Diego
Midwest Bio Services, LLC	Closed
Midwest Psychiatric Research	Closed
Nanocine	Closed
NextSource Biotechnology, LLC	Now in Miami, FL
Odontex, Inc.	Closed
Orion Bioscience Inc.	Now in Omaha, NE
Oxbow Animal Health	Now in Omaha, NE
PepPro Analytics, LLC	Closed
Precise Clinical Research Solutions	Closed
SmartVet	Closed
Sunhai Bioadhesive Technologies, LLC	Closed

While the Biotechnology Research and Testing segment has been the largest segment in terms of overall company count until the current Census, it has also seen the most turnover. An analysis of companies removed from the list due to closure, change in focus, relocation, or merger/acquisitions, reveals that nearly two-thirds of the companies dropped during the last four Census periods were in the Biotechnology Research and Testing, and Drugs and Pharmaceuticals industry segments. (Table 13) These two segments also are the largest segments, and also have historically higher counts of new companies relative to the other industry segments. (See Table 8)

Table 13: Dropped Company Analysis

	<i>Total Removed</i>	<i>PHARM</i>	<i>HEALTH IT</i>	<i>RESEARCH</i>	<i>MED DEV</i>	<i>AG CHEM</i>	<i>FEED/PLANT</i>
2009*	28	8	1	10	4	1	4
2012	31	4	1	12	7	1	6
2015	55	14	4	22	10	1	4
2018	29	8	2	10	6	1	2

* Companies who were dropped due to criteria changes in this Census were excluded.

Care should be taken when interpreting these results, as the reasons for removal are varied, and are part of the changes that occur naturally with company formations and closures in any industry. However, it should be noted that some of the Biotechnology Research and Testing companies dropped from the list due to industry consolidation in this segment over the past 12 years. Additionally, pharmaceutical companies face long development times from formation to revenue, increasing the risk that the company will fail to reach profitability.

Company Structure

Nearly three-quarters of the region's life sciences companies are single locations, or company headquarters, with about 20% branch locations with headquarters outside of the region. The overall composition has not changed significantly since the last census, although a proportionally slight increase was noted in the number of companies who are classified as US headquarters of a multinational company in 2018. (Table 14) This information was only gathered for survey respondents in 2006 and 2009.

Table 14: Life Sciences Companies by Company Structure

<i>Life Sciences Company Structure</i>	<i>2012</i>	<i>2015</i>	<i>2018</i>
Headquarters of company/Single location	180	192	212
Branch location	52	48	61
US headquarters of a multinational company	8	10	19

Companies by Life Sciences Industry Segment

While SIC and NAICS codes were used to provide an initial list of companies, these codes are too broad and included companies poorly aligned with the definition used for the census reports since 2006. The industry segments delineated from the initial listing of SIC and NAICS codes and other primary sources were refined and grouped into the following industry segments:

- Biotechnology Research and Testing
- Drugs and Pharmaceuticals
- Food Science/Feed or Plant-Based Products
- Healthcare & Life Science IT (Health IT)
- Medical Device
- Organic or Agricultural Chemicals

In previous Census efforts, companies who responded to the census survey sometimes changed their industry segment classification from one Census to the next. While some of this change is a response to strategic shifts or pivots, some change possibly resulted from a lack of clarity in the segment definitions. As a result, the 2018 survey provided the following guidance to respondents who were asked about their company's primary area of expertise:

- **Biotechnology Research and Testing** - Laboratories providing critical analysis and services, excluding exclusive consumer health labs, and/or firms performing Research and Development to advance new discoveries, treatments or services.
- **Drugs & Pharmaceuticals** - Developing and or manufacturing medicinal, botanical, and biological products for therapeutic or diagnostic applications.
- **Food Science/Feed or Plant-Based Products** - Food science companies research, develop and produce products integrating biological, chemical, and physical sciences. Plant-based product companies engage in research and development activities producing biofuels, composite materials, enhanced nutritional feeds/food, or synthetic meats.
- **Healthcare & Life Science IT** - Developing software and technology to expand the capabilities of the bioscience industry
- **Medical Devices and Instruments** – Researching & Developing products with applications for animal or human health
- **Organic or Agricultural Chemicals** - Companies whose research and/or development support plant science and agricultural sectors within the life sciences

Past Census efforts included a category of Software and Medical Information Services, that was shortened to 'Software' as an area of expertise. As information technology contributions to life sciences research have expanded beyond just software to data analysis and research support, the terminology for this report has changed to Healthcare & Life Science IT, or 'Health IT' to better define this industry segment.

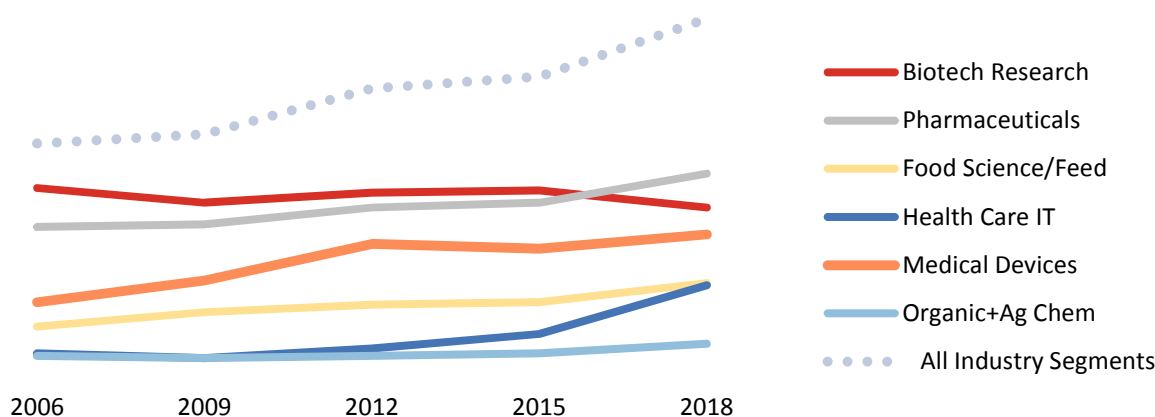
The census survey forms asked respondents to identify their *primary* expertise, and were also given the opportunity to indicate areas of secondary expertise. If companies did not respond to the census request, industry segments were assigned utilizing company websites, and/or third party resources, such as economic developers or innovation center directors. It should be noted that many companies claim expertise across more than one area. For example, many medical device companies are capturing data for research and analysis, but their primary expertise is developing products for animal or human health. For the purpose of this analysis, however, only one primary area was associated with each company to avoid counting companies more than once, and to provide comparisons with previous Census results.

For the first time since the Census reports have been published in 2006, Drugs and Pharmaceuticals is the largest segment, supplanting Biotechnology Research and Testing. While Health IT is fifth in terms of number of companies, the segment employs a substantial percentage of the overall region's life sciences employment. (Table 15 and Figure 4)

Table 15: Life Sciences Companies by Industry Segment

<i>Industry Segment 2018</i>	<i># of Companies</i>	<i>% of Industry</i>	<i>Employment Estimates</i>	<i>% of industry</i>
Biotechnology Research and Testing	68	23%	5,518	16%
Drugs and Pharmaceuticals	82	28%	6,970	20%
Food Science/Feed	37	13%	3,417	10%
Health IT	36	12%	15,379	44%
Medical Devices	57	20%	1,398	4%
Organic or Agricultural Chemicals	12	4%	1,929	6%
Total Number of Companies	292		34,611	

Figure 4: Historical Life Sciences Industry Segments



	<u>2006</u>	<u>2009</u>	<u>2012</u>	<u>2015</u>	<u>2018</u>
Biotechnology Research and Testing	76	70	74	75	68
Drugs and Pharmaceuticals	60	61	68	70	82
Food Science/Feed	19	25	28	29	37
Health Care IT	8	6	10	16	36
Medical Devices	29	38	53	51	57
Organic or Agricultural Chemicals	7	6	7	8	12
All Industry Segments	199	206	240	249	292

In comparison to the 2015 census, the largest proportional increases were found in the Drugs and Pharmaceuticals and Health Care IT segments. Biotechnology Research and Testing has been relatively flat since 2006, and declined in the total number of companies in 2018. After a large increase in Medical Device companies in the 2009-2012 period, the number of companies has only grown slightly in the following years.

Drugs and Pharmaceuticals

Drugs and Pharmaceuticals companies comprise the largest industry segment in the 2018 Census, with 82 companies representing 28% of the total number of companies, and nearly

7,000 employees, or 20% of the life sciences employment base. Human Health is the primary focus for 57 of these companies, while 25 have a primary focus on Animal Health.

Companies in this segment develop and/or manufacture medicinal, botanical, and biological products for therapeutic or diagnostic applications. Several companies in this category provide supporting products or services to the pharmaceutical industry, including contract research organizations that provide direct benefit to pharmaceutical research companies, such as testing, clinical trials, or placement of researchers. Additional companies provide services encompassing the entire spectrum of clinical development programs and/or perform *in vitro* drug metabolism and drug-drug interaction studies for pharmaceutical and chemical companies.

After relatively flat growth in the last two census periods, the net number of companies in this segment has grown by 12 companies since 2015, a 17% increase. Eighteen companies are new to the list, while eight have been removed from the list, and two changed their primary industry segment to Drugs and Pharmaceuticals since the last census. Employment has grown from roughly 6,100 to nearly 7,000 in the same period, a 15% increase. Eighteen companies employing 187 people have been added since the last census, most of them early stage companies with fewer than 25 employees. Their small size is a contributing factor to the company increase percentage being greater than the employment percentage increase.

This segment has seen continuous employment growth in each Census period, with employment growth of 71%, from roughly 4,000 employees in 2006 to nearly 7,000 in 2018. Notable employment growth has occurred in animal health companies Boehringer Ingelheim Vetmedica, Inc. and Ceva Animal Health, and human health company Millipore Sigma, formerly known as SAFC Biosciences, Inc. The eight companies removed from the list employed about 70 people; five are closed, and three have relocated. Teva Pharmaceuticals' beginning transition of its Overland Park headquarters into a planned New Jersey facility has resulted in this segment's largest company reduction in headcount.

Table 16: Drugs and Pharmaceuticals

Drugs and Pharmaceuticals			
#	Company	City	State
Human Health			
1	Acceleration Laboratory Services, Inc.	Lee's Summit	MO
2	Altasciences Clinical Research, Vince & Associates	Overland Park	KS
3	Analab Clinical Research	Lenexa	KS
4	B.F. Ascher & Company, Inc.	Lenexa	KS
5	Bio Med Valley Discoveries, Inc.	Kansas City	MO
6	BioNovus Innovations, LLC	Kansas City	MO
7	Biopharma Services	Columbia	MO
8	Bond Biosciences	Lawrence	KS
9	Cardinal Health Regulatory Services	Overland Park	KS
10	Catain Laboratories, LLC	Kansas City	MO
11	Catalent Pharma Solutions	Kansas City	MO
12	Celgene Corporation	Overland Park	KS
13	Center For Pharmaceutical Resarch	Kansas City	MO
14	Central Solutions Inc	Kansas City	KS

<i>Drugs and Pharmaceuticals</i>			
<i>#</i>	<i>Company</i>	<i>City</i>	<i>State</i>
15	Cingulate Therapeutics	Mission	KS
16	Clinical Research of The Ozarks, Inc.	Columbia	MO
17	Crititech, Inc.	Lawrence	KS
18	Deciphera Pharmaceuticals	Lawrence	KS
19	EAG Laboratories	Columbia	MO
20	Effexus Pharmaceutical	Leawood	KS
21	Eir Pharmaceuticals	Leawood	KS
22	Fennik Life Sciences, LLC	Kansas City	KS
23	Hafion, LLC	Lawrence	KS
24	Heart of America Eyecare, PA	Overland Park	KS
25	Hunkeler Eye Institute	Overland Park	KS
26	Hyalogic, LLC	Riverside	MO
27	HylaPharm	Lawrence	KS
28	IMT Labs	Lawrence	KS
29	Itamark Diagnostics, LLC	Columbia	MO
30	Johnson County Clintrials, LLC	Lenexa	KS
31	Kangen Pharmaceutical	Kansas City	KS
32	Kansas City Safety Alliance & Research	Lenexa	KS
33	KrolPharma Resources	Overland Park	KS
34	Microprotein Technologies, Inc.	Lenexa	KS
35	Millipore Sigma	Lenexa	KS
36	Motega Health	Lawrence	KS
37	Nostrum Laboratories, Inc.	Kansas City	MO
38	Novadiol, Inc.	Shawnee	KS
39	Now System, Inc.	Kansas City	KS
40	Oncimmune USA, LLC	De Soto	KS
41	One Medicine Consulting	Olathe	KS
42	Osteogenex Inc.	Overland Park	KS
43	PETNET Solutions, Inc.	Overland Park	KS
44	PRA International	Lenexa	KS
45	Propharma Group, Inc.	Overland Park	KS
46	Proteon Therapeutics	Kansas City	KS
47	Quality Research Services	Lenexa	KS
48	Rowe Neurology Institute	Lenexa	KS
49	Silergate Pharmaceuticals, Inc.	Overland Park	KS
50	Sopharmbique	Atchison	KS
51	TCI Peptide Therapeutics	Columbia	MO
52	Teva Pharmaceuticals	Overland Park	KS
53	Trinity Biotech	Kansas City	MO
54	TVAX Biomedical, LLC	Olathe	KS
55	UBC - An Express Scripts Company	Kansas City	MO

<i>Drugs and Pharmaceuticals</i>			
<i>#</i>	<i>Company</i>	<i>City</i>	<i>State</i>
56	Ventria Bioscience	Junction City	KS
57	Veritas Clinical Specialities	Topeka	KS
<i>Animal Health</i>			
1	Addison Biological Laboratory, Inc.	Fayette	MO
2	AgriLabs	St. Joseph	MO
3	Aratana Therapeutics	Leawood	KS
4	Argenta Research, LLC	Lawrence	KS
5	Bayer Animal Health	Shawnee	KS
6	BioPharmaPotentials	Kansas City	MO
7	Boehringer Ingelheim Vetmedica, Inc.	St. Joseph	MO
8	Ceva Animal Health	Lenexa	KS
9	Clipper Distributing Co	St. Joseph	MO
10	Conklin Company, Inc.	Kansas City	MO
11	Dechra Veterinary Products	Leawood	KS
12	Elanco Animal Health	Overland Park	KS
13	ELIAS Animal Health, LLC	Olathe	KS
14	ENDOVAC Animal Health	Columbia	MO
15	Jinyu Bio-technology	Manhattan	KS
16	Kindred Biosciences	Elwood	KS
17	Likarda	Kansas City	KS
18	Mazen Animal Health	St. Joseph	MO
19	Merck Animal Health	De Soto	KS
20	Nika Biochemicals, Inc.	Overland Park	KS
21	Norbrook, Inc.	Lenexa	KS
22	Parnell, Inc.	Overland Park	KS
23	Prommune Innovation in Immunotherapy	Overland Park	KS
24	Sinclair Research Center	Auxvasse	MO
25	Sparhawk Laboratories, Inc.	Lenexa	KS

Biotechnology Research and Testing

Biotechnology Research and Testing companies comprise the second largest industry segment in the region, with 68 companies representing 23% of the total number of companies and about 5,500 employees, or 16% of the region's life sciences employment base.

This industry segment is comprised of laboratories providing critical analysis and services, excluding exclusive consumer health labs, and/or firms performing Research and Development to advance new discoveries, treatments or services. Companies within this sector can be broadly classified into two primary groups:

- Companies generating new products or processes.
- Companies providing research and/or testing services to support companies that develop new products and technology.

Laboratories whose primary function is to provide testing services to the consumer health market were excluded. Those companies conducting testing for both research purposes and consumer health, however, were included on the list. Employee numbers were not broken out by function, so counts reflect all of those working in the region at their respective companies, which is consistent with the methodology for the past Census reports.

Of the 68 companies in this industry segment 50 have a primary focus on human health, 16 focus on animal health, and two provide research and testing for plant sciences companies. The 12 companies new to the list are early stage companies, employing a total of 68 people. Ten companies were removed from the list; seven were closed, one relocated and two were acquired and closed. Nine companies changed their primary industry segment focus since the 2015 Census. The 2018 Census was the first to provide formal definitions for each of the industry segments to the respondents, which improved clarity for the respondents, so it is possible that company primary focus had not changed, but was more clearly identified in the 2018 Census. The net result of these changes was a decline in the number of Biotechnology Research and Testing companies from 75 in 2015 to 68 companies in 2018.

While some of the decline in the total number of companies can be attributed to company shifts in primary focus, decline in this segment relative to others is also due to consolidation in this industry and fewer new entrants to the segment. Twenty-two new entrants to the segment were listed in both the 2015 and 2012 Census reports, compared to 12 new entrants in 2018.

Employment in this segment declined from about 6,200 employees in 2015 to just over 5,500 employees in 2018, an 11% decline. The decline can in part be attributed to two larger companies, Ceva Animal Health, whose response to their primary industry focus changed from Research in 2015 to Drugs and Pharmaceuticals in 2018, and Biomin, who changed from Research to Feed Science in 2018, which reduced overall employment totals in the segment. MRI Global reported the largest decline in headcount, and a roughly equal number of companies showed gains or declines in employment since the last Census.

The largest gains in employment have been at the largest companies in the segment. IQVIA, formerly Quintiles, and Quest Diagnostics have added nearly 1,900 employees since the 2006 Census. Midwest Anatomic Pathology Lab, and Physicians Reference Laboratory in the region have been acquired by LabCorp in the last six years, which has also relocated its regional laboratory to Dallas during this period, which has resulted in a net loss of about 350 jobs in the region.

Overall, this segment can be characterized by 10 companies with over 100 employees that employ 85% of the people in this segment, with the remaining 58 companies employing 15%. These 10 companies have added 2,400 employees since 2006, but these gains have been offset by smaller companies that either closed, reduced staff, or were relocated from the region following acquisitions. (Table 17)

Table 17: Biotechnology Research and Testing

<i>Biotechnology Research and Testing</i>			
#	Company	City	State
<i>Human Health</i>			
1	4m Healthcare, LLC	Olathe	KS
2	Alburtylab, Inc.	Drexel	MO
3	Ansera Analytics	Olathe	KS
4	BioFluidica	Lawrence	KS
5	Brenoak Labs, LLC	Columbia	MO
6	Cancer Research Center	Columbia	MO
7	Cardiovascular Imaging Technologies L.L.C.	Kansas City	MO
8	Cardiovascular Outcomes	Kansas City	MO
9	C C Medical (aka ArNeu)	Olathe	KS
10	Clinical Reference Laboratory, Inc.	Lenexa	KS
11	Clinical Research Consultants	Kansas City	MO
12	Compliant Clinical Research	Olathe	KS
13	CryoCrate	Columbia	MO
14	DeNovo Genomics	Kansas City	KS
15	Durrie Vision	Overland Park	KS
16	Evogen Inc.	Overland Park	KS
17	Certified Energy/Environmental Labs, LLC	Lee's Summit	MO
18	Exodus Biosciences	Lawrence	KS
19	GTC Research	Shawnee	KS
20	ImmuPep, Inc.	Lawrence	KS
21	IntelligeneCG	Olathe	KS
22	IQVIA	Overland Park	KS
23	KanPRO	Lawrence	KS
24	Kansas City Allergy & Asthma	Overland Park	KS
25	Kansas Regenerative	Manhattan	KS
26	Kantar Health	Overland Park	KS
27	K C Bio, LLC	Lenexa	KS
28	KCAS, LLC	Shawnee	KS
29	Keystone Laboratories, Inc.	Kansas City	KS
30	Lab Corp (was PRL)	Overland Park	KS
31	Liberty Pharma Inc.	Liberty	MO
32	Mawd Pathology Group, Inc.	Kansas City	MO
33	Meta Bioscience, LLC	Overland Park	KS
34	Missouri Cancer Associates, LLC	Columbia	MO
35	MRIGLOBAL	Kansas City	MO
36	Nectagen, Inc.	Kansas City	KS
37	Pace Analytical Services, Inc.	Lenexa	KS
38	pHLOGISTIX, LLC	Fairway	KS
39	CTT Research	Prairie Village	KS

<i>Biotechnology Research and Testing</i>			
#	Company	City	State
40	ProTox Services	Lenexa	KS
41	PTC Laboratories, Inc.	Columbia	MO
42	Quest Diagnostics Inc	Lenexa	KS
43	Sekisui XenoTech, LLC	Kansas City	KS
44	SJK Global, LLC	Olathe	KS
45	Stowers Institute For Medical Research	Kansas City	MO
46	The Great Plains Laboratory	Lenexa	KS
47	Thermo Fisher Scientific Inc.	Lenexa	KS
48	Triad Isotopes, Inc..	Kansas City	MO
49	Viracor Eurofins	Lee's Summit	MO
50	Xenometrics, LLC	Stilwell	KS
<i>Animal Health</i>			
1	AlcheraBio, LLC	Lawrence	KS
2	Allied Monitor Inc	Fayette	MO
3	Antech Diagnostics, Inc.	Overland Park	KS
4	Centaur Animal Health	Olathe	KS
5	Central Biomedica Inc.	Lenexa	KS
6	Paradox Inc., dba CIA Labs	St. Joseph	MO
7	Ecto Development Corporation	Blue Springs	MO
8	Enso Discoveries	Manhattan	KS
9	Hennessy Research Associates	Shawnee	KS
10	Herschel J Gaddy & Associates	St. Joseph	MO
11	Identigen North America, Inc.	Lawrence	KS
12	IDEXX BioResearch	Columbia	MO
13	Orbis Biosciences, Inc.	Lenexa	KS
14	Veterinary and Biomedical Research Center, Inc.	Manhattan	KS
15	Veterinary Specialty Products, Inc.	Overland Park	KS
16	Zoetis, Inc.	Kansas City	MO
<i>Plant and Biologicals</i>			
1	Global Biologics, LLC	Columbia	MO
2	SCD Probiotics	Kansas City	MO

Medical Device

Medical Device companies comprise the third largest industry segment in the 2018 Census, with 57 companies representing 20% of the total number of companies. The region's medical device companies employ roughly 1,400 employees, or 4% of the region's life sciences employment base. (Table 18)

Companies in this segment research and develop products with applications for human health, human health, or plant sciences. Companies who produce or distribute medical devices, but do not have a research and development capability in the Census region were excluded from the list.

This segment is comprised of mostly small companies with an average of only 25 employees compared to the average of ~80 employees per firm company in the Biotechnology Research and Testing, and the Drug and Pharmaceutical segments. Of the 57 companies in this industry segment, 50 have a primary focus on human health, six focus on animal health, and one develops equipment for plant sciences companies. The 12 companies new to the list are early stage companies, employing a total of 125 people. Six companies were removed from the list; three were closed, one, Avatar Engineering was acquired by Pivot International in Lenexa, and two relocated from the region.

The medical device segment has seen the largest increase in the total number of companies since 2006, growing from 29 companies in 2006 to 57 companies in 2018. Employment has grown from just over 450 employees in 2006 to nearly 1,400 in 2018. Only three companies, Schroer Manufacturing, Labconco, and Pivot International have over 100 employees, and Pivot's organic growth and acquisitions have made it the fastest growing company in the segment.

Table 18: Medical Device Companies

<i>Medical Device</i>			
<i>#</i>	<i>Company</i>	<i>City</i>	<i>State</i>
<i>Human Health</i>			
1	ARE Labs Inc.	Olathe	KS
2	ASP Medical, LLC	Kansas City	KS
3	Bio-Interface Engineering	Columbia	MO
4	Biomedical Devices of Kansas, LLC	Tonganoxie	KS
5	Blue Endo	Overland Park	KS
6	Brownmed, Inc.	Kansas City	MO
7	Cardioptimus, LLC	Columbia	MO
8	Certtech, LLC	Lenexa	KS
9	Clara Diagnostics	Lawrence	KS
10	ContourMD	Overland Park	KS
11	Cramer Products, Inc.	Gardner	KS
12	Creche Innovations	Stilwell	KS
13	CSS Analytical Co Inc	Shawnee	KS
14	Disposable Instrument Company	Lenexa	KS
15	Ehrhardt Clinical Research, LLC	Belton	MO
16	EMCI (Epic Medical Concepts and Innovations)	Mission	KS
17	Engenious Design	Overland Park	KS
18	Evoke Medical	Lawrence	KS
19	Exocytronics, LLC	Columbia	MO
20	Flow Forward Medical	Olathe	KS
21	Hans Rudolph, Inc.	Shawnee	KS
22	HEMCO Corp	Independence	MO
23	ImpeDx Diagnostics	Kansas City	KS
24	Innara Health	Olathe	KS
25	InnovaPrep, LLC	Drexel	MO
26	J2 Scientific	Columbia	MO

<i>Medical Device</i>			
<i>#</i>	<i>Company</i>	<i>City</i>	<i>State</i>
<i>Human Health</i>			
27	Knit-Rite, Inc.	Kansas City	KS
28	Labconco Corporation	Kansas City	MO
29	Medical Device Solutions	Lenexa	KS
30	Medical Positioning	Kansas City	MO
31	Metactive Medical, Inc.	Olathe	KS
32	Mobility Designed	Kansas City	MO
33	Nanova Inc	Columbia	MO
34	Nexus Medical, LLC	Lenexa	KS
35	Oceanic Medical Products, Inc.	Atchison	KS
36	Ortho-Care, Inc.	Overland Park	KS
37	Pinnacle Technology Inc.	Lawrence	KS
38	Pivot International	Lenexa	KS
39	Plastikon Healthcare, LLC	Lawrence	KS
40	QVM Svc	Trimble	MO
41	RBC Medical Innovations	Lenexa	KS
42	Scientific Analytics Inc.	Overland Park	KS
43	Simplicated Innovation	Kansas City	MO
44	Southwest Technologies Inc.	N Kansas City	MO
45	Spinal Simplicity	Overland Park	KS
46	Vitalograph, Inc.	Lenexa	KS
47	West Device Innovations, LLC	Kansas City	KS
48	Worldwide Innovations & Tech	Lenexa	KS
49	Woundcare 360	Olathe	KS
50	Zutron Medical	Lenexa	KS
<i>Animal Health</i>			
1	Equinosis, LLC	Columbia	MO
2	Phoreus Biotechnology, Inc.	Olathe	KS
3	Pulse Needle Free Systems Inc.	Overland Park	KS
4	Schroer Manufacturing Company	Kansas City	KS
5	Simcro	Lawrence	KS
6	Stone Manufacturing & Supply Co., Inc.	Kansas City	MO
<i>Plant</i>			
1	Steinlite Corp	Atchison	KS

Food Science/Feed or Plant-Based Products

Food Science companies comprise the 4th largest industry segment in the 2018 Census, with 37 companies representing 13% of the total number of companies. This segment employs about 3,500 people, or 10% of the region's life sciences employment base.

Food science companies research, develop and produce products integrating biological, chemical, and physical sciences. Plant-based product companies engage in research and

development activities producing biofuels, composite materials, enhanced nutritional feeds/food, or synthetic meats.

Companies in this segment are generally larger, with an average employment of close to 100, and have generally seen fewer changes over the last 12 years. Eight companies were added to the list since 2015: three located in the region from outside the area, four are new companies, and one, Compass Minerals expanded with a new facility to research plant nutrition. These eight companies employ 293 people in the region. Two companies, Biozyme Incorporated and Heartland Plant Innovations changed primary focus to Food Science from Research since 2015. Two companies were removed from the list, one closed, and one closed its branch location in the region, both with minimal impact on employment.

Hill's Pet Products is largest company in the segment, although 12 of the 37 companies in this segment employ more than 100 people. Food Science/Feed companies have added just over 2,000 net employees in the region in the last 12 years, a 144% increase from the nearly 1,400 employed in 2006. While Hill's has added 300 employees over this time, net gains in this segment have come from a mixture of growth of existing companies, and addition of new companies in the region, minus some employment declines or closures of some companies over the Census timeframe.

Table 19: Food Science/Feed or Plant-Based Product Companies

<i>Food Science/Feed or Plant-Based Products</i>			
#	Company	City	State
1	Advanta Seeds	Manhattan	KS
2	AIB International	Manhattan	KS
3	American Proteins Inc	Concordia	MO
36	Ameri-Pac, Inc.	St. Joseph	MO
4	Big Heart Pets	Lawrence	KS
5	BioGen Ag	Spring Hill	KS
6	Biomin	Overland Park	KS
7	Biozyme Incorporated	St. Joseph	MO
8	Cargill Animal Nutrition	Kansas City	KS
9	Cargill Inc	Kansas City	MO
10	Cereal Ingredients, Inc.	Leavenworth	KS
11	Compass Minerals	Overland Park	KS
12	Corbion	Lenexa	KS
13	DeLaval Manufacturing (West Agro)	Kansas City	MO
14	DuPont Industrial Biosciences	New Century	KS
15	DuPont Nutrition & Health	St. Joseph	MO
16	Great Plains Analytical Laboratory	Kansas City	MO
17	Heartland Plant Innovaitons	Manhattan	KS
18	Hill's Pet Nutrition, Inc	Topeka	KS
19	Ioditech, Inc.	Kansas City	MO
20	iVet Professional Formulas	Parkville	MO
21	Lifeline Foods, LLC	St. Joseph	MO
22	Manna Pro Products, LLC	Kansas City	KS

<i>Food Science/Feed or Plant-Based Products</i>			
<i>#</i>	<i>Company</i>	<i>City</i>	<i>State</i>
23	Mars Petcare	Kansas City	MO
24	MGPI Processing, Inc.	Atchison	KS
25	Mid-South Milling Company, Inc.	Kansas City	KS
26	MS Biotec	Wamego	KS
27	NBO3 Technologies	Manhattan	KS
28	Nestle Purina PTC	St. Joseph	MO
29	PrairieChar	Lawrence	KS
30	Pro-Pet	Kansas City	KS
31	Purina Mills, LLC	St. Joseph	MO
32	Star Labs (Forage Research)	Clarksdale	MO
33	Tiger Energy Solutions	Columbia	MO
34	Tonistry Inc.	St. Joseph	MO
35	Vita A Zine Inc	Butler	MO
37	ZuPreem	Shawnee	KS

Health IT

Health Information Technology companies are playing a bigger role in the Life Sciences industry, as researchers seek to better understand and utilize data to improve outcomes and efficiencies. This segment has had the largest employment growth since 2015, with the net addition of nearly 5,000 employees in the region.

Health IT companies comprise the 5th largest industry segment in the 2018 Census, with 36 companies representing 12% of the total number of companies. This segment employs about 15,400 people, or 44% of the region's life sciences employment base.

Healthcare and Life Science Information Technology companies develop software and technology to expand the capabilities of the bioscience industry. Past Census efforts included a category of Software and Medical Information Services, that was shortened to 'Software' as an area of expertise. As information technology contributions to life sciences research have expanded beyond just software to data analysis and research support, the terminology for this report has changed to Healthcare & Life Science IT, or 'Health IT' to better define this industry segment.

The Health IT segment employment is dominated by the presence of Cerner, a provider of health information technology solutions and services to health systems, which is headquartered in the region. This segment is also bolstered by the addition of 19 companies to the list with a total of 250 employees. While Garmin was added to the list as a result of their health data research collaborations, an estimate of those employees focused on these efforts was utilized, to not skew the results by adding the entire Garmin workforce to the segment total. Two companies were removed from the list since 2015, one closed and the other relocated. Additionally, two companies changed their primary focus to Health IT from Research and Testing in their 2018 census response.

Table 20: Health IT Companies

Health Information Technology			
#	Company	City	State
Human Health			
1	Adaptivepharma, LLC	Leawood	KS
2	Advanced Clustering Technologies, Inc.	Kansas City	KS
3	AEGLE Palette, LLC	Shawnee	KS
4	AKCIA Inc	Kansas City	MO
5	AnalyzeDirect	Overland Park	KS
6	Asuun	Kansas City	MO
7	Bardavon Health Innovations	Overland Park	KS
8	Captify	Lenexa	KS
9	Cerner Corporation	Kansas City	MO
10	Chronic Cow, LLC	Kansas City	MO
11	EMB Statistical Solutions	Overland Park	KS
12	Engage Mobile Solutions	Kansas City	MO
13	Enovation, LLC (iRheum)	Kansas City	KS
14	Garmin International Inc.	Olathe	KS
15	Health Outcomes Sciences	Overland Park	KS
16	HeartToHeart Network, LLC	Fairway	KS
17	I Share Medical	Kansas City	MO
18	Illuminate	Overland Park	KS
19	Informed Health Solutions	Overland Park	KS
20	LifeScience Technologies, LLC	Leawood	KS
21	Mediware Information Systems, Inc.	Lenexa	KS
22	Netsmart	Overland Park	KS
23	Oberd	Columbia	MO
24	Orion Integrated Biosciences	Manhattan	KS
25	Pathfinder Health Innovations Inc.	Kansas City	MO
26	PatientsVoices	Parkville	MO
27	Play-it Health Adherence Management	Overland Park KS	KS
28	Quest Analytics, LLC	Independence	MO
29	Redivus Health	Olathe	KS
30	Sickweather	Kansas City	MO
31	Telecare Global, LLC	Kansas City	MO
32	TeraCrunch	Leawood	KS
33	TheraWe Connect	Lawrence	KS
Animal Health			
1	FitBark Inc.	Kansas City	MO
2	Innovative Products, Inc.	Mission	KS
3	Rex Animal Health	Kansas City	MO

Organic or Agricultural Chemicals

Organic or Agricultural Chemical companies comprise the smallest industry segment in the 2018 Census, with 14 companies representing 4% of the total number of companies. This segment employs about 2,000 people, or 6% of the region's life sciences employment base.

Organic or Agricultural Chemical companies perform research and/or development to support plant science and agricultural sectors within the life sciences. Four companies: Albaugh, Bayer Cropscience, MFA and PBI/Gordon are the largest companies in this segment, with 90% of the employment.

While the number of companies is small, and has remained small since 2006, the segment has seen an increase of 1,200 employees in this time. Of the five companies added to the list in 2018, Inovatia Laboratories and SynTech Research changed their primary focus to Agricultural Chemicals from Research and Testing since the 2015 Census, and Phytotechnology Laboratories changed to Agricultural Chemicals from Feed/Plant. Chemical formulator and product development company HPI and crop protection product company Omnium, LLC are new to the list. AgBiTech relocated from the area and was removed from the list.

Table 21: Organic or Agricultural Chemicals

<i>Organic or Agricultural Chemicals</i>			
#	Company	City	State
1	Albaugh, LLC	St. Joseph	MO
2	BASF Corporation	St. Joseph	MO
3	Bayer Cropscience LP	Kansas City	MO
4	HPI	St. Joseph	MO
5	Inovatia Laboratories, LLC	Fayette	MO
6	KALO Inc	Overland Park	KS
7	MFA Inc	Columbia	MO
8	Omnium, LLC	St. Joseph	MO
9	PBI/Gordon	Kansas City	MO
10	Phytotechnology Laboratories, L.L.C.	Lenexa	KS
11	Rockwell Laboratories, Ltd.	Kansas City	MO
12	SynTech Research	Stilwell	KS

Companies by Geographic Segment

Companies with more than one location in the region are counted by the location of their headquarters, or by the primary research facility location. The exception to this rule is the employee count for Cerner. Due to their large size the headcount by state was obtained to properly account for employees in each state. Roughly two-thirds of the region's life sciences companies are located, or have their primary headquarters or research facilities in Kansas, with the remaining third located in Missouri.

While both Kansas and Missouri have gained companies over time, Kansas has increased a larger proportional share of companies and employment over the last 12 years. (Table 22)

Table 22: Companies & Employment by State over Time

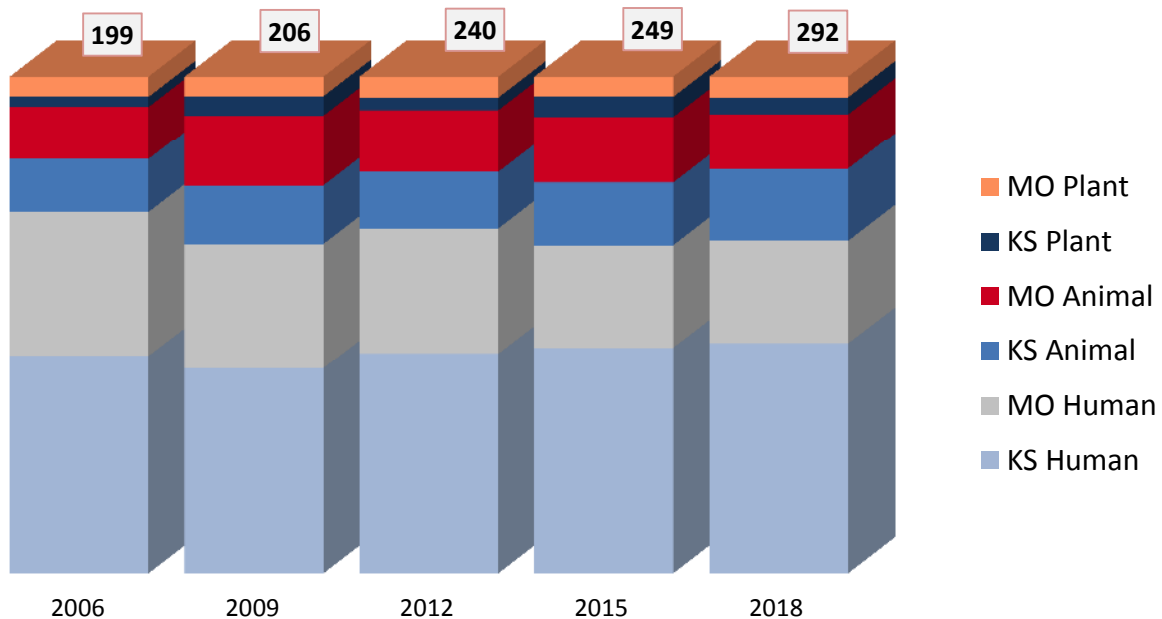
<i>Companies and Employment by State 2018</i>				
<i>Primary Focus</i>	<i>KS Companies</i>	<i>KS Employees</i>	<i>MO Companies</i>	<i>MO Employees</i>
Human Health	135	11,137	61	15,063
Animal Health	42	3,005	32	2,420
Plant Science	10	947	12	2,039
2018 Totals	187	15,089	105	19,522
Percent of Overall Region	64%	44%	36%	56%
Change from 2015 Census	22.2%	28.9%	9.4%	17.8%

<i>Companies and Employment by State over Time</i>				
<i>Primary Focus</i>	<i>KS Companies</i>	<i>KS Employees</i>	<i>MO Companies</i>	<i>MO Employees</i>
Total for 2006 Census	112	7,128	87	10,400
Percent of Overall Region	56%	41%	44%	59%
Total for 2009 Census	117	8,505	89	10,331
Percent of Overall Region	57%	45%	43%	55%
Total for 2012 Census	139	10,243	101	12,621
Percent of Overall Region	58%	45%	42%	55%
Total for 2015 Census	155	11,807	95	16,462
Percent of Overall Region	62%	42%	38%	58%

Of the 71 new companies added to the list since 2015, 50 of the companies were in Kansas; 18 Kansas companies were removed from the list due to closure, merger or relocation, for a net gain of 32 companies. In Missouri, 21 of the companies added to the list were located in the state, and 11 companies were removed from the list due to closure, merger or relocation, for a net gain of 10 companies.

Kansas largest gains have been in the human health segment over the last 12 years, while Missouri's primary gains in absolute numbers have been in animal health companies, although proportionally, Kansas has gained a greater share of Human, Animal and Plant-focused companies relative to Missouri since 2006. (Figure 5)

Figure 5: Companies and Primary Focus over Time



	2006	2009	2012	2015	2018
MO Plant	8	8	10	10	12
KS Plant	4	8	6	10	10
MO Animal	21	29	30	33	32
KS Animal	21	24	27	31	42
MO Human	58	52	61	52	61
KS Human	87	85	106	113	135
Total	199	206	240	249	292

Industry clusters consist of companies, suppliers and service providers, as well as government agencies and other institutions that provide education, information, research and technical support to a regional economy. Industry clusters are associated with higher levels of economic growth, as increased support and resources can facilitate company growth and formation. Most companies identified were in close proximity to universities, counties with major population centers from which to draw employees, and/or other life sciences companies with shared expertise, training and support which are critical to creating an atmosphere of growth.

Ten companies are located at the Kansas Bioscience Park - Venture Accelerator in Olathe, KS. All are small companies, with a total of about 50 employees. This building has been listed for sale, so the location of the companies at this address in the future is not assured as this report is being published. In addition to these 10 companies, 30 other Kansas companies are located at one of the state's business incubators or research parks. Nine life sciences companies list their address at a Missouri business incubator.

Of these 49 companies:

- Four were listed in the 2006 and 2009 Census reports
- Twelve were listed in the 2012 Census report, and
- Twenty-five were listed in the 2015 Census report

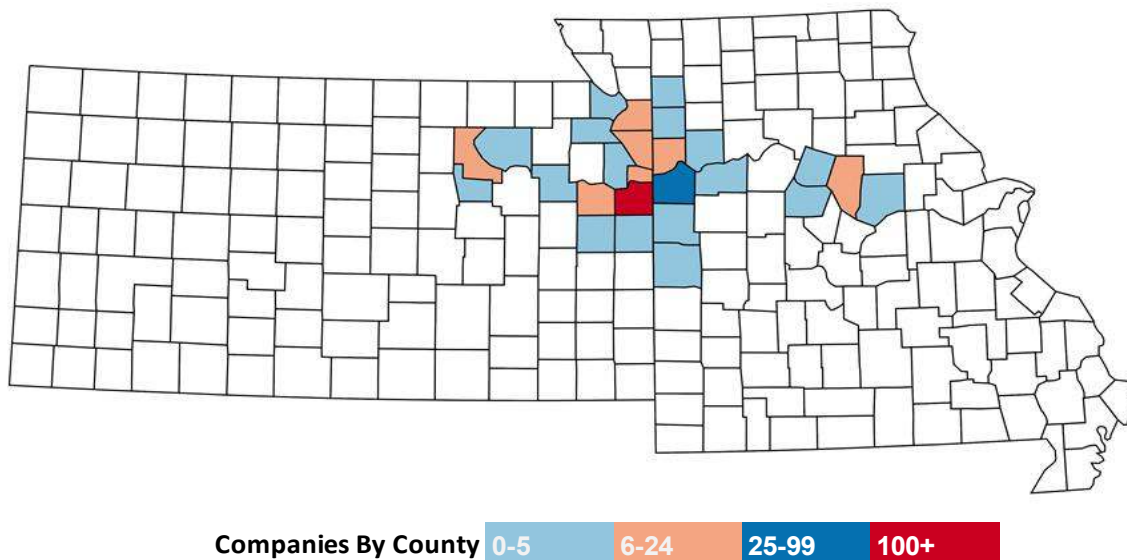
Two of these companies have been in the Lawrence incubator since 2006. Small company employee headcounts can fluctuate and some headcounts for this analysis are estimates, but about 170 employees work at these businesses in 2018, and none have more than 25 employees in the region.

Table 23: Companies and Employees by Region

Area of Region 2018	# of Companies	%	Employment Estimate	%
Atchison/Leavenworth Area - KS	7	2%	449	1%
Topeka/Manhattan Area - KS	13	4%	957	3%
St. Joseph Area - MO	19	7%	2,364	7%
Kansas City Region - KS	20	7%	3,136	9%
Lawrence, KS	22	8%	312	1%
Columbia Region - MO	26	9%	1,418	4%
Kansas City Region - MO	60	21%	15,740	45%
Johnson County Region - KS	125	43%	10,235	30%
Total Companies	292		34,611	

When examining the presence in individual counties, 17 of the 26 counties in the census region have five or fewer life sciences companies. (Figure 6)

Figure 6: Concentration of Life Sciences Companies



The seven counties in the orange-shaded regions have 36% of the companies, and 47% of the region’s life sciences employees. Jackson County is home to 40 (14%) of the region’s life sciences companies, with about 6,700 employees, or roughly 20% of total employment. Johnson County leads the region with 124 (42%) of the companies, and about 30% of the employment.

The largest number of companies is found in Johnson County, and this county has also had the largest increase, with a net gain of 16 companies since the 2015 census. The Kansas City

Missouri region has seen a net increase of 10 companies since 2015. All other areas have seen a net increase since 2015, except for the Columbia, MO region, with a net loss of four companies since 2015.

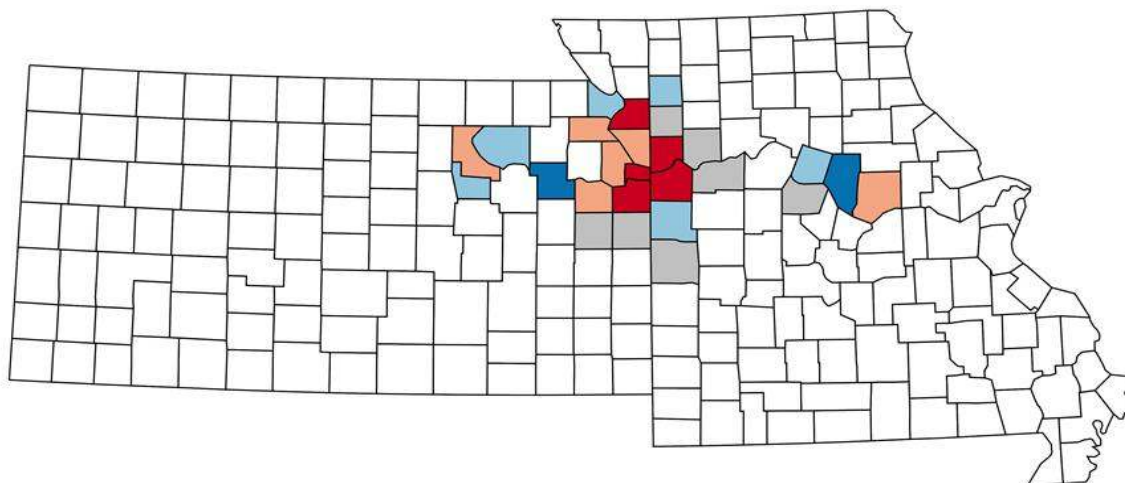
Table 24: Employment Change by Region

Region	Change from 2015-2018	
	Change in Companies	Employment Change
Atchison/Leavenworth Area - KS	+2	+225
Columbia Region - MO	-4	+325
Topeka/Manhattan Area - KS	+2	-234
Johnson County Region - KS	+16	+892
Kansas City Region - KS	+7	+2540
Kansas City Region - MO	+10	+2012
Lawrence, KS	+6	-37
St. Joseph Area - MO	+3	+619

Despite the net loss of companies since 2015, the Columbia, MO region has seen a net gain of employment of over 300 people since 2015. The largest employment gains were noted in the Kansas City, MO, and Kansas City, KS regions, both with gains of over 2,000 employees since 2015. It should be noted when evaluating these results that Cerner’s campus expansions in both of these regions have impacted these totals. Johnson County gained just under 900 employees, indicating that much of the growth in this region is by small companies.

Employment counts are highest in the immediate Kansas City region, and in St. Joseph, MO, which has continued to gain animal health jobs. Smaller employment concentrations are centered around the region’s universities: K-State in Manhattan, KS (Riley), KU in Lawrence, KS (Douglas), and MU in Columbia, MO (Boone). (Figure 7)

Figure 7: Regional Life Sciences Employment

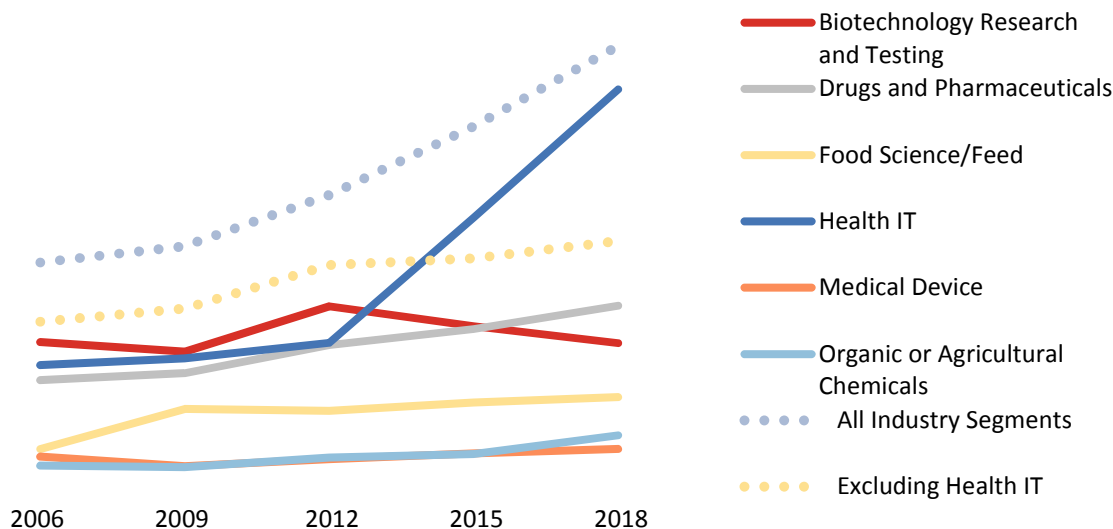


Employment By County: 0-9 10-49 50-499 500-1499 1500+

Companies by Employment

Companies who responded to the census form provided an employment total for the region, For the companies that did not respond, estimates were based on published databases, company websites, third parties such as economic development professionals, and coverage of the company in the local press. With that information, it can be conservatively estimated that the region has more than 34,000 employees associated with life sciences companies. The largest industry sectors, by employment, are Drugs and Pharmaceuticals, Biotechnology Research and Testing, and Healthcare Information Technology, with an estimated 80% of the total workforce.

Figure 8: Life Sciences Employment Change by Industry Segment



	<u>2006</u>	<u>2009</u>	<u>2012</u>	<u>2015</u>	<u>2018</u>
Biotech Research	5,553	5,182	6,940	6,175	5,518
Drugs/Pharma	4,069	4,347	5,443	6,060	6,970
Medical Device	1,099	730	1,006	1,224	1,398
Food Science/Feed	1,398	2,957	2,881	3,208	3,417
Health IT	4,660	4,925	5,528	10,397	15,379
Org + Ag Chem	749	695	1,067	1,205	1,929
All Industry Segments	17,528	18,836	22,865	28,269	34,611
Excluding Health IT	12,868	13,911	17,337	17,872	19,232

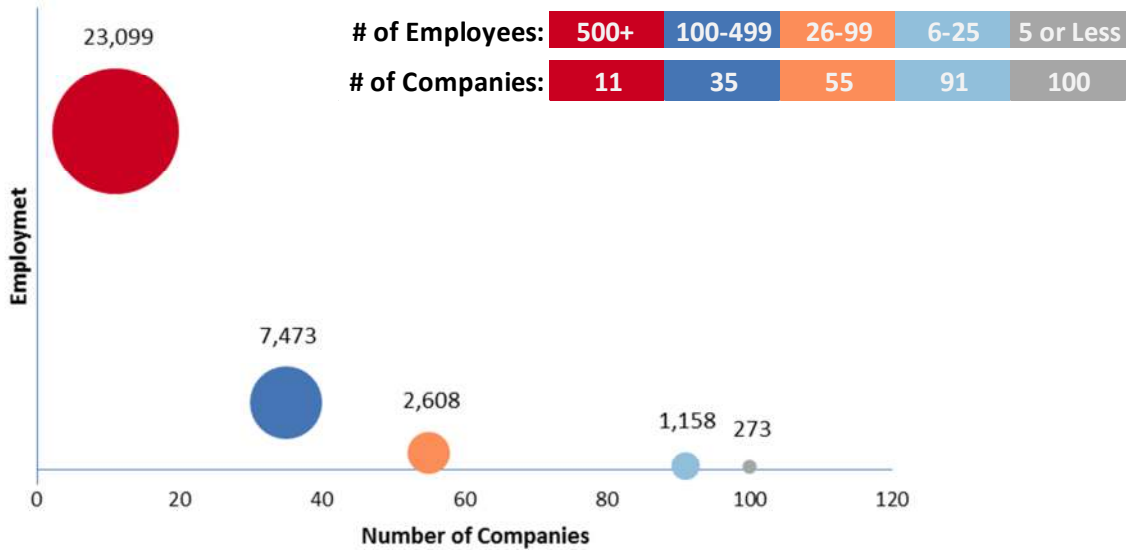
While employment gains at Cerner disproportionately impacted total employment numbers in the region since 2012, employment gains have been realized in other industry segments over time. The Biotechnology Research and Testing employment numbers have been the most volatile, with the highest total of new companies, and the highest total of closed or relocated companies since 2006. (Figure 8)

Companies Listed by Total Employment

The list of Life Sciences companies in the region was analyzed by company-reported or estimated employment ranges. The largest companies have the lion's share of employment in the region – 11 companies in the region employ roughly two-thirds of the region's total life

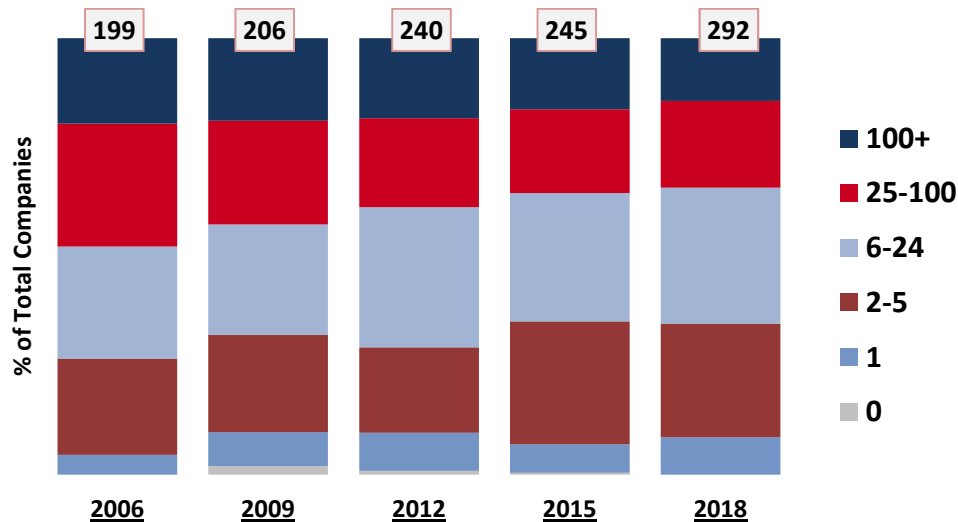
sciences employees. Conversely, the 100 smallest companies have just under 300 total employees. (Figure 9)

Figure 9: Distribution of Companies by Total Employment in 2018



The composition of the companies who make up the list was proportionally analyzed over time. This analysis indicates that much of the growth in the total number of companies in the region has been from companies with less than 25 employees. For instance, from 2006 to 2018 the number of companies with more than 100 employees has grown from 39 to 42, representing a smaller portion of the overall company list. In 2006, 51 companies employed between 6-24 people, compared to 91 companies in 2018. (Figure 10)

Figure 10: Proportional Distribution of Companies by Employment over Time



Companies Listed by Employment Size

The following 11 companies are the largest life sciences employers in the Kansas City region — each with 500 or more employees. These companies represent only 4% of the total number of

life sciences companies, but approximately 67% of the total employment base. Eight of the 11 companies listed have increased headcount since 2015.

Table 25: Life Sciences Companies with 500+ Employees

#	Company	City	State
1	Bayer Animal Health	Shawnee	KS
2	Bayer Cropsience LP	Kansas City	MO
3	Boehringer Ingelheim Vetmedica, Inc.	St. Joseph	MO
4	Catalent Pharma Solutions	Kansas City	MO
5	Cerner Corporation	Kansas City	MO
6	Hill's Pet Nutrition, Inc.	Topeka	KS
7	IQVIA	Overland Park	KS
8	MFA Inc.	Columbia	MO
9	Netsmart	Overland Park	KS
10	PRA International	Lenexa	KS
11	Quest Diagnostics Inc	Lenexa	KS

Thirty-five companies employ between 100 and 499 employees in the region. These 35 companies employ almost 7,500, representing 12% of the companies, and 22% of total employment. In 2015, there were 32 companies in this segment, but employment is roughly the same. While six companies increased employment by over 100 employees since 2015, gains were offset by companies who decreased employment, although most decreases were relatively small. (Table 26)

Table 26: Life Sciences Companies with 100-499 Employees

<i>Companies with 100-499 Employees</i>			
#	Company	City	State
1	AIB International	Manhattan	KS
2	Albaugh, LLC	St. Joseph	MO
3	Altasciences Clinical Research, Vince & Associates	Overland Park	KS
4	Cereal Ingredients, Inc.	Leavenworth	KS
5	Ceva Animal Health	Lenexa	KS
6	Clinical Reference Laboratory, Inc.	Lenexa	KS
7	Compass Minerals	Overland Park	KS
8	Corbion	Lenexa	KS
9	Del Monte Pet Products	Lawrence	KS
10	DeLaval Manufacturing (West Agro)	Kansas City	MO
11	DuPont Industrial Biosciences	New Century	KS
12	DuPont Nutrition & Health	St. Joseph	MO
13	EAG Laboratories	Columbia	MO
14	Elanco Animal Health	Overland Park	KS
15	KCAS, LLC	Shawnee	KS
16	Lab Corp (was PRL)	Overland Park	KS
17	Labconco Corporation	Kansas City	MO

<i>Companies with 100-499 Employees</i>			
<i>#</i>	<i>Company</i>	<i>City</i>	<i>State</i>
18	Lifeline Foods, LLC	St. Joseph	MO
19	Mediware Information Systems, Inc.	Lenexa	KS
20	Merck Animal Health	De Soto	KS
21	MGPI Processing, Inc.	Atchison	KS
22	Millipore Sigma	Lenexa	KS
23	MRIGLOBAL	Kansas City	MO
24	Nestle Purina PTC	St. Joseph	MO
25	Nostrum Laboratories Inc.	Kansas City	MO
26	PBI/Gordon	Kansas City	MO
27	Pivot International	Lenexa	KS
28	Schroer Manufacturing Company	Kansas City	KS
29	Sekisui XenoTech, LLC	Kansas City	KS
30	Sinclair Research Center	Auxvasse	MO
31	Stowers Institute For Medical Research	Kansas City	MO
32	Teva Pharmaceuticals	Overland Park	KS
33	UBC - An Express Scripts Company	Kansas City	MO
34	Viracor Eurofins	Lee's Summit	MO
35	Xenometrics, LLC	Stilwell	KS

Fifty-five companies employ between 25 and 99 employees, which represents about 19% of the companies in the region, and about 7% of the total employment. This segment employs about 2,600 workers. Seven new companies added about 350 employees in this segment, and 26 of the companies who were in the region in 2015 showed employment increases in the last three years.

Table 27: Life Sciences Companies with 25-99 Employees

<i>Companies with 25-99 Employees</i>			
<i>#</i>	<i>Company</i>	<i>City</i>	<i>State</i>
1	Addison Biological Laboratory, Inc.	Fayette	MO
2	AgriLabs	St. Joseph	MO
3	Ameri-Pac, Inc.	St. Joseph	MO
4	Aratana Therapeutics	Leawood	KS
5	B.F. Ascher & Company, Inc.	Lenexa	KS
6	Bardavon Health Innovations	Overland Park	KS
7	Biopharma Services	Columbia	MO
8	Biozyme Incorporated	St. Joseph	MO
9	Blue Endo	Overland Park	KS
10	Cardinal Health Regulatory Services	Overland Park	KS
11	Cargill Animal Nutrition	Kansas City	KS
12	Celgene Corporation	Overland Park	KS
13	Center For Pharmaceutical Research	Kansas City	MO
14	Central Solutions Inc	Kansas City	KS

<i>Companies with 25-99 Employees</i>			
<i>#</i>	<i>Company</i>	<i>City</i>	<i>State</i>
15	Certified Energy/Environmental Labs, LLC	Lee's Summit	MO
16	Conklin Company, Inc.	Kansas City	MO
17	Cramer Products, Inc.	Gardner	KS
18	Dechra Veterinary Products	Leawood	KS
19	Deciphera Pharmaceuticals	Lawrence	KS
20	Durrie Vision	Overland Park	KS
21	Garmin International Inc.	Olathe	KS
22	Great Plains Analytical Laboratory	Kansas City	MO
23	Hans Rudolph, Inc.	Shawnee	KS
24	Heart of America Eyecare, PA	Overland Park	KS
25	HEMCO Corp	Independence	MO
26	HPI	St. Joseph	MO
27	IDEXX BioResearch	Columbia	MO
28	Ioditech, Inc.	Kansas City	MO
29	Kansas City Allergy & Asthma	Overland Park	KS
30	Knit-Rite, Inc.	Kansas City	KS
31	LifeScience Technologies, LLC	Leawood	KS
32	Manna Pro Products, LLC	Kansas City	KS
33	Mars Petcare	Kansas City	MO
34	Mawd Pathology Group, Inc.	Kansas City	MO
35	Missouri Cancer Associates, LLC	Columbia	MO
36	Oberd	Columbia	MO
37	Omnium, LLC	St. Joseph	MO
38	Pace Analytical Services, Inc.	Lenexa	KS
39	Parnell Inc	Overland Park	KS
40	Pinnacle Technology Inc.	Lawrence	KS
41	Plastikon Healthcare, LLC	Lawrence	KS
42	Pro-Pet	Kansas City	KS
43	Propharma Group Inc	Overland Park	KS
44	Purina Mills, LLC	St. Joseph	MO
45	RBC Medical Innovations	Lenexa	KS
46	Rowe Neurology Institute	Lenexa	KS
47	SCD Probiotics	Kansas City	MO
48	Southwest Technologies Inc	N Kansas City	MO
49	Sparhawk Laboratories, Inc.	Lenexa	KS
50	Stone Manufacturing & Supply Co., Inc.	Kansas City	MO
51	SynTech Research	Stilwell	KS
52	The Great Plains Laboratory	Lenexa	KS
53	Thermo Fisher Scientific Inc.	Lenexa	KS
54	Trinity Biotech	Kansas City	MO
55	Zoetis Inc.	Kansas City	MO

Ninety-one companies, 31% of the total companies in the region, employ between six and 24 workers, for a total of roughly 1,100 workers, about 3% of the total employment in the region. Twenty-two new companies in this segment added about 275 employees in the region since the last Census report. Of the companies on the list in 2015, about a third have fewer employees than in 2015, another third are the same or +/- one employee, and a third have increased employment since the last Census.

Table 28: Life Sciences Companies with 6-24 Employees

<i>Companies with 6-24 Employees</i>			
#	Company	City	State
1	Acceleration Laboratory Services, Inc.	Lee's Summit	MO
2	Advanced Clustering Technologies, Inc.	Kansas City	KS
3	AKCIA Inc	Kansas City	MO
4	American Proteins Inc	Concordia	MO
5	AnalyzeDirect	Overland Park	KS
6	Antech Diagnostics, Inc.	Overland Park	KS
7	Argenta Research, LLC	Lawrence	KS
8	BASF Corporation	St. Joseph	MO
9	Bio Med Valley Discoveries, Inc.	Kansas City	MO
10	BioFluidica	Lawrence	KS
11	Biomedical Devices of Kansas, LLC	Tonganoxie	KS
12	Biomin	Overland Park	KS
13	Brownmed, Inc.	Kansas City	MO
14	Cancer Research Center	Columbia	MO
15	Captify	Lenexa	KS
16	Cargill Inc	Kansas City	MO
17	Centaur Animal Health	Olathe	KS
18	Central Biomedica Inc.	Lenexa	KS
19	Certtech, LLC	Lenexa	KS
20	Cingulate Therapeutics	Mission	KS
21	Clipper Distributing Co	St. Joseph	MO
22	ContourMD	Overland Park	KS
23	Creche Innovations	Stilwell	KS
24	Crititech, Inc.	Lawrence	KS
25	CTT Research	Prairie Village	KS
26	Disposable Instrument Company	Lenexa	KS
27	Ecto Development Corporation	Blue Springs	MO
28	ELIAS Animal Health, LLC	Olathe	KS
29	EMB Statistical Solutions	Overland Park	KS
30	ENDOVAC Animal Health	Columbia	MO
31	Engage Mobile Solutions	Kansas City	MO
32	Engenious Design	Overland Park	KS
33	Enso Discoveries	Manhattan	KS

<i>Companies with 6-24 Employees</i>			
<i>#</i>	<i>Company</i>	<i>City</i>	<i>State</i>
34	Fennik Life Sciences, LLC	Kansas City	KS
35	GTC Research	Shawnee	KS
36	Heartland Plant Innovaitons	Manhattan	KS
37	Herschel J Gaddy & Assoc	St. Joseph	MO
38	Hunkeler Eye Institute	Overland Park	KS
39	Hyalogic, LLC	Riverside	MO
40	I Share Medical	Kansas City	MO
41	Illuminate	Overland Park	KS
42	Innara Health	Olathe	KS
43	InnovaPrep, LLC	Drexel	MO
44	Inovatia Laboratories, LLC	Fayette	MO
45	IntelligeneCG	Olathe	KS
46	J2 Scientific	Columbia	MO
47	K C Bio, LLC	Lenexa	KS
48	KALO Inc	Overland Park	KS
49	Kansas City Safety Alliance & Research	Lenexa	KS
50	Kansas Regenerative	Manhattan	KS
51	Kindred Biosciences	Elwood	KS
52	Liberty Pharma Inc.	Liberty	MO
53	Likarda	Kansas City	KS
54	Medical Positioning	Kansas City	MO
55	Microprotein Technologies Inc.	Lenexa	KS
56	Mid-South Milling Company, Inc.	Kansas City	KS
57	Mobility Designed	Kansas City	MO
58	Motega Health	Lawrence	KS
59	MS Biotec	Wamego	KS
60	Nanova Inc	Columbia	MO
61	NBO3 Technologies	Manhattan	KS
62	Nexus Medical, LLC	Lenexa	KS
63	Norbrook Inc	Lenexa	KS
64	Oncimmune USA, LLC	De Soto	KS
65	Orbis Biosciences, Inc.	Lenexa	KS
66	Ortho-Care, Inc.	Overland Park	KS
67	Paradox, Inc./CIA Labs	St. Joseph	MO
68	Pathfinder Health Innovations, Inc.	Kansas City	MO
69	PatientsVoices	Parkville	MO
70	Phytotechnology Laboratories, LLC	Lenexa	KS
71	ProTox Services	Lenexa	KS
72	PTC Labs DBA Genetrait Laboratories	Columbia	MO
73	Pulse Needle Free Systems, Inc.	Overland Park	KS
74	Quest Analytics, LLC	Independence	MO

<i>Companies with 6-24 Employees</i>			
<i>#</i>	<i>Company</i>	<i>City</i>	<i>State</i>
75	QVM Services	Trimble	MO
76	Redivus Health	Olathe	KS
77	Scientific Analytics Inc.	Overland Park	KS
78	Silvergate Pharmaceuticals, Inc.	Overland Park	KS
79	Spinal Simplicity	Overland Park	KS
80	Star Labs (Forage Research)	Clarksdale	MO
81	Steinlite Corp	Atchison	KS
82	TeraCrunch	Leawood	KS
83	Tonistry Inc.	St. Joseph	MO
84	Triad Isotopes, Inc..	Kansas City	MO
85	Ventria Bioscience	Junction City	KS
86	Veritas Clinical Specialties	Topeka	KS
87	Veterinary and Biomedical Research Center, Inc.	Manhattan	KS
88	Vita A Zine Inc.	Butler	MO
89	Vitalograph Inc.	Lenexa	KS
90	Worldwide Innovations & Tech	Lenexa	KS
91	ZuPreem	Shawnee	KS

Of the 292 life sciences companies in the region, the 100 companies in the region with five or fewer employees show the region's potential for growth. Representing 34% of the companies, this segment employs less than 300 employees, less than 1% of total employment. Forty of the 71 companies new to the list have fewer than five employees, with total employment of about 100 people. Of the remaining 60 companies, only 15 added one or more employees since 2015, indicating an opportunity for support and resources to bolster these small companies. (Table 29)

Table 29: Life Sciences Companies with 5 or Fewer Employees

<i>Companies with 5 or Fewer Employees</i>			
<i>#</i>	<i>Company</i>	<i>City</i>	<i>State</i>
1	4m Healthcare, LLC	Olathe	KS
2	Adaptivepharma, LLC	Leawood	KS
3	Advanta Seeds	Manhattan	KS
4	AEGLE Palette, LLC	Shawnee	KS
5	Alburtylab, Inc.	Drexel	MO
6	AlcheraBio, LLC	Lawrence	KS
7	Allied Monitor, Inc.	Fayette	MO
8	Analab Clinical Research	Lenexa	KS
9	Ansera Analytics	Olathe	KS
10	ARE Labs, Inc.	Olathe	KS
11	ASP Medical, LLC	Kansas City	KS
12	Asuun	Kansas City	MO
13	BioGen Ag	Spring Hill	KS

<i>Companies with 5 or Fewer Employees</i>			
<i>#</i>	<i>Company</i>	<i>City</i>	<i>State</i>
14	Bio-Interface Engineering	Columbia	MO
15	BioNovus Innovations, LLC	Kansas City	MO
16	BioPharmaPotentials	Kansas City	MO
17	Bond Biosciences	Lawrence	KS
18	Brenoak Labs, LLC	Columbia	MO
19	C C Medical (aka ArNeu)	Olathe	KS
20	Cardioptimus, LLC	Columbia	MO
21	Cardiovascular Imaging Technologies L.L.C.	Kansas City	MO
22	Cardiovascular Outcomes	Kansas City	MO
23	Catain Laboratories, LLC	Kansas City	MO
24	Chronic Cow, LLC	Kansas City	MO
25	Clara Diagnostics	Lawrence	KS
26	Clinical Research Consultants	Kansas City	MO
27	Clinical Research of The Ozarks, Inc.	Columbia	MO
28	Compliant Clinical Research	Olathe	KS
29	CryoCrate	Columbia	MO
30	CSS Analytical Co, Inc.	Shawnee	KS
31	DeNovo Genomics	Kansas City	KS
32	Effexus Pharmaceutical	Leawood	KS
33	Ehrhardt Clinical Research, LLC	Belton	MO
34	Eir Pharmaceuticals	Leawood	KS
35	EMCI (Epic Medical Concepts and Innovations)	Mission	KS
36	Enovation, LLC	Kansas City	KS
37	Equinosis, LLC	Columbia	MO
38	Evogen, Inc..	Overland Park	KS
39	Evoke Medical	Lawrence	KS
40	Exocytronics, LLC	Columbia	MO
41	Exodus Biosciences	Lawrence	KS
42	FitBark Inc.	Kansas City	MO
43	Flow Forward Medical	Olathe	KS
44	Global Biologics, LLC	Columbia	MO
45	Hafion, LLC	Lawrence	KS
46	Health Outcomes Sciences	Overland Park	KS
47	HeartToHeart Network, LLC	Fairway	KS
48	Hennessy Research Associates	Shawnee	KS
49	HylaPharm- was called Nonopharm	Lawrence	KS
50	Identigen North America, Inc.	Lawrence	KS
51	ImmuPep, Inc.	Lawrence	KS
52	ImpeDx Diagnostics	Kansas City	KS
53	IMT Labs	Lawrence	KS
54	Informed Health Solutions	Overland Park	KS

<i>Companies with 5 or Fewer Employees</i>			
<i>#</i>	<i>Company</i>	<i>City</i>	<i>State</i>
55	Innovative Products, Inc.	Mission	KS
56	Itamark Diagnostics, LLC	Columbia	MO
57	iVet Professional Formulas	Parkville	MO
58	Jinyu Bio-technology	Manhattan	KS
59	Johnson County Clintrials, LLC	Lenexa	KS
60	Kangen Pharmaceutical	Kansas City	KS
61	KanPRO	Lawrence	KS
62	Kantar Health	Overland Park	KS
63	Keystone Laboratories, Inc.	Kansas City	KS
64	KrolPharma Resources	Overland Park	KS
65	Mazen Animal Health	St. Joseph	MO
66	Medical Device Solutions	Lenexa	KS
67	Meta Bioscience, LLC	Overland Park	KS
68	Metactive Medical, Inc.	Olathe	KS
69	Nectagen, Inc.	Kansas City	KS
70	Nika Biochemicals, Inc.	Overland Park	KS
71	Novadiol, Inc.	Shawnee	KS
72	Now System, Inc.	Kansas City	KS
73	Oceanic Medical Products, Inc.	Atchison	KS
74	One Medicine Consulting	Olathe	KS
75	Orion Integrated Biosciences	Manhattan	KS
76	Osteogenex, Inc.	Overland Park	KS
77	PETNET Solutions, Inc.	Overland Park	KS
78	pHLOGISTIX LLC	Fairway	KS
79	Phoreus Biotechnology, Inc.	Olathe	KS
80	Play-it Health Adherence Management	Overland Park	KS
81	PrairieChar	Lawrence	KS
82	Prommune Innovation in Immunotherapy	Overland Park	KS
83	Proteon Therapeutics	Kansas City	KS
84	Quality Research Services	Lenexa	KS
85	Rex Animal Health	Kansas City	MO
86	Rockwell Laboratories, Ltd.	Kansas City	MO
87	Sickweather	Kansas City	MO
88	Simcro	Lawrence	KS
89	Simplified Innovation	Kansas City	MO
90	SJK Global, LLC	Olathe	KS
91	Sopharmbique	Atchison	KS
92	TCI Peptide Therapeutics	Columbia	MO
93	Telecare Global, LLC	Kansas City	MO
94	TheraWe Connect	Lawrence	KS
95	Tiger Energy Solutions	Columbia	MO

<i>Companies with 5 or Fewer Employees</i>			
<i>#</i>	<i>Company</i>	<i>City</i>	<i>State</i>
96	TVAX Biomedical, LLC	Olathe	KS
97	Veterinary Specialty Products, Inc.	Overland Park	KS
98	West Device Innovations, LLC	Kansas City	KS
99	Woundcare 360	Olathe	KS
100	Zutron Medical	Lenexa	KS

Full Listing of Companies

Following is a listing of the 292 life sciences companies identified in the Kansas City region, along with notation of the presence of the company in the region over the previous census period.

Table 30: Listing of Regional Life Sciences Companies

<i>#</i>	<i>2018</i>		<i>Company</i>	<i>City</i>	<i>State</i>	<i>Focus</i>
	<i>2015</i>	<i>response</i>				
1			4m Healthcare LLC	Olathe	KS	Human
2	Y	Y	Acceleration Laboratory Services, Inc.	Lee's Summit	MO	Human
3	Y		Adaptivepharma, LLC	Leawood	KS	Human
4	Y	Y	Addison Biological Laboratory, Inc.	Fayette	MO	Animal
5	Y		Advanced Clustering Technologies, Inc.	Kansas City	KS	Human
6			Advanta Seeds	Manhattan	KS	Plant
7			AEGLE Palette LLC	Shawnee	KS	Human
8	Y		AgriLabs	St. Joseph	MO	Animal
9	Y		AIB International	Manhattan	KS	Human
10	Y		AKCIA Inc	Kansas City	MO	Human
11	Y	Y	Albaugh, LLC	St. Joseph	MO	Plant
12	Y	Y	Alburtylab, Inc.	Drexel	MO	Human
13			AlcheraBio, LLC	Lawrence	KS	Animal
14	Y		Allied Monitor Inc/Addison Labs	Fayette	MO	Animal
15	Y		Altasciences Clinical Research, Vince & Associates	Overland Park	KS	Human
16	Y		AMPRO Products	Concordia	MO	Animal
17	Y		Analab Clinical Research	Lenexa	KS	Human
18	Y		AnalyzeDirect	Overland Park	KS	Human
19	Y		Ansera Analytics	Olathe	KS	Human
20	Y		Antech Diagnostics, Inc.	Overland Park	KS	Animal
21	Y	Y	Aratana Therapeutics	Leawood	KS	Animal
22	Y		ARE Labs, Inc..	Olathe	KS	Human
23	Y	Y	Argenta Research LLC	Lawrence	KS	Animal

#	2018		Company	City	State	Focus
	2015	response				
24	Y		ASP Medical, LLC	Kansas City	KS	Human
25			Asuun	Kansas City	MO	Human
26	Y		B.F. Ascher & Company, Inc.	Lenexa	KS	Human
27	Y		Bardavon Health Innovations	Overland Park	KS	Human
28	Y		BASF Corporation	St. Joseph	MO	Plant
29	Y		Bayer Animal Health	Shawnee	KS	Animal
30	Y	Y	Bayer Cropsience LP	Kansas City	MO	Plant
31	Y		Big Heart Pet Brands	Lawrence	KS	Animal
32	Y	Y	Bio Med Valley Discoveries, Inc.	Kansas City	MO	Human
33			BioFluidica	Lawrence	KS	Human
34			BioGen Ag	Spring Hill	KS	Animal
35	Y		Bio-Interface Engineering	Columbia	MO	Human
36	Y	Y	Biomedical Devices of Kansas LLC	Tonganoxie	KS	Human
37		Y	Biomim	Overland Park	KS	Animal
38	Y		BioNovus Innovations LLC	Kansas City	MO	Human
39		Y	Biopharma Services	Columbia	MO	Human
40	Y	Y	BioPharmaPotentials	Kansas City	MO	Animal
41	Y	Y	Biozyme Incorporated	St. Joseph	MO	Animal
42	Y		Blue Endo	Overland Park	KS	Human
43	Y		Boehringer Ingelheim Vetmedica, Inc.	St. Joseph	MO	Animal
44			Bond Biosciences	Lawrence	KS	Human
45			Brenoak Labs LLC	Columbia	MO	Human
46	Y	Y	Brownmed, Inc.	Kansas City	MO	Human
47	Y		Cancer Research Center	Columbia	MO	Human
48			Captify	Lenexa	KS	Human
49	Y	Y	Cardinal Health Regulatory Services	Overland Park	KS	Human
50	Y		Cardioptimus LLC	Columbia	MO	Human
51	Y		Cardiovascular Imaging Technologies L.L.C.	Kansas City	MO	Human
52			Cardiovascular Outcomes	Kansas City	MO	Human
53	Y		Cargill Animal Nutrition	Kansas City	KS	Animal
54	Y		Cargill, Inc.	Kansas City	MO	Animal
55			Catain Laboratories LLC	Kansas City	MO	Human
56	Y		Catalent Pharma Solutions	Kansas City	MO	Human
57	Y		CC Medical (aka ArNeu)	Olathe	KS	Human
58	Y		Celgene Corporation	Overland Park	KS	Human
59	Y		Centaur Animal Health	Olathe	KS	Animal

#	2018		Company	City	State	Focus
	2015	response				
60	Y	Y	Center For Pharmaceutical Research	Kansas City	MO	Human
61	Y	Y	Central Biomedica, Inc.	Lenexa	KS	Animal
62	Y		Central Solutions, Inc.	Kansas City	KS	Human
63	Y	Y	Cereal Ingredients, Inc.	Leavenworth	KS	Human
64	Y	Y	Cerner Corporation	Kansas City	MO	Human
65	Y		Certtech, LLC	Lenexa	KS	Human
66	Y	Y	Ceva Animal Health	Lenexa	KS	Animal
67		Y	Chronic Cow, LLC	Kansas City	MO	Human
68	Y	Y	CIA Labs	St. Joseph	MO	Animal
69		Y	Cingulate Therapeutics	Mission	KS	Human
70		Y	Clara Diagnostics	Lawrence	KS	Human
71	Y		Clinical Reference Laboratory, Inc.	Lenexa	KS	Human
72	Y		Clinical Research Consultants	Kansas City	MO	Human
73	Y		Clinical Research of The Ozarks, Inc.	Columbia	MO	Human
74	Y		Clipper Distributing Co	St. Joseph	MO	Animal
75		Y	Compass Minerals	Overland Park	KS	Plant
76			Compliant Clinical Research	Olathe	KS	Human
77	Y		Conklin Company, Inc.	Kansas City	MO	Animal
78			ContourMD	Overland Park	KS	Human
79	Y		Corbion	Lenexa	KS	Plant
80	Y		Cramer Products, Inc.	Gardner	KS	Human
81	Y		Creche Innovations	Stilwell	KS	Human
82	Y		Crititech, Inc.	Lawrence	KS	Human
83	Y		CryoCrate	Columbia	MO	Human
84	Y		CSS Analytical Co, Inc.	Shawnee	KS	Human
85	Y		Dechra Veterinary Products	Leawood	KS	Animal
86	Y	Y	Deciphera Pharmaceuticals	Lawrence	KS	Human
87	Y		DeLaval Manufacturing (West Agro)	Kansas City	MO	Animal
88			DeNovo Genomics	Kansas City	KS	Human
89	Y	Y	Disposable Instrument Company	Lenexa	KS	Human
90	Y		Dupont Industrial Biosciences	New Century	KS	Human
91	Y		DuPont Nutrition & Health	St. Joseph	MO	Human
92	Y		Durrie Vision	Overland Park	KS	Human
93	Y	Y	EAG Laboratories	Columbia	MO	Human
94	Y	Y	Ecto Development Corporation	Blue Springs	MO	Animal
95	Y		Effexus Pharmaceutical	Leawood	KS	Human

#	2018		Company	City	State	Focus
	2015	response				
96	Y		Ehrhardt Clinical Research LLC	Belton	MO	Human
97		Y	Eir Pharmaceuticals	Leawood	KS	Human
98	Y		Elanco Animal Health	Overland Park	KS	Animal
99	Y	Y	ELIAS Animal Health, LLC	Olathe	KS	Animal
100	Y		EMB Statistical Solutions	Overland Park	KS	Human
101	Y		EMCI (Epic Medical Concepts and Innovations)	Mission	KS	Human
102	Y	Y	ENDOVAC Animal Health	Columbia	MO	Animal
103			Engage Mobile Solutions	Kansas City	MO	Human
104		Y	Engenious Design	Overland Park	KS	Human
105			Enovation, LLC	Kansas City	KS	Human
106		Y	Enso Discoveries	Manhattan	KS	Animal
107	Y	Y	Equinosis, LLC	Columbia	MO	Animal
108	Y		Evogen, Inc.	Overland Park	KS	Human
109	Y	Y	Evoke Medical, LLC	Lawrence	KS	Human
110	Y		Excite Pharma Services	Lee's Summit	MO	Human
111	Y		Exocytronics, LLC	Columbia	MO	Human
112		Y	Exodus Biosciences	Lawrence	KS	Human
113			Fennik Life Sciences, LLC	Kansas City	KS	Human
114	Y	Y	FitBark, Inc.	Kansas City	MO	Animal
115	Y		Flow Forward Medical	Olathe	KS	Human
116			Garmin International, Inc.	Olathe	KS	Human
117	Y		Global Biologics LLC	Columbia	MO	Plant
118	Y	Y	Great Plains Analytical Laboratory	Kansas City	MO	Human
119	Y		GTC Research	Shawnee	KS	Human
120			Hafion, LLC	Lawrence	KS	Human
121	Y	Y	Hans Rudolph, Inc.	Shawnee	KS	Human
122	Y		Health Outcomes Sciences	Overland Park	KS	Human
123	Y	Y	Heart of America Eyecare, PA	Overland Park	KS	Human
124	Y	Y	Heartland Plant Innovations	Manhattan	KS	Plant
125			HeartToHeart Network LLC	Fairway	KS	Human
126	Y		HEMCO Corp	Independence	MO	Human
127	Y		Hennessy Research Associates	Shawnee	KS	Animal
128	Y		Herschel J Gaddy & Assoc	St. Joseph	MO	Animal
129	Y	Y	Hill's Pet Nutrition, Inc.	Topeka	KS	Animal
130			HPI	St. Joseph	MO	Plant
131	Y		Hunkeler Eye Institute	Overland Park	KS	Human

#	2018		Company	City	State	Focus
	2015	response				
132	Y	Y	Hyalogic, LLC	Riverside	MO	Human
133	Y		HylaPharm	Lawrence	KS	Human
134			I Share Medical	Kansas City	MO	Human
135	Y		Identigen North America, Inc.	Lawrence	KS	Animal
136	Y		IDEXX BioAnalytics	Columbia	MO	Animal
137			Illuminate	Overland Park	KS	Human
138	Y		ImmuPep, Inc.	Lawrence	KS	Human
139	Y		ImpeDx Diagnostics	Kansas City	KS	Human
140			IMT Labs	Lawrence	KS	Human
141	Y		Informed Health Solutions	Overland Park	KS	Human
142	Y		Innara Health	Olathe	KS	Human
143	Y	Y	InnovaPrep LLC	Drexel	MO	Human
144		Y	Innovative Products, Inc.	Mission	KS	Animal
145	Y	Y	Inovatia Laboratories, LLC	Fayette	MO	Human
146	Y		IntelligeneCG	Olathe	KS	Human
147	Y		Ioditech, Inc.	Kansas City	MO	Animal
148	Y	Y	IQVIA	Overland Park	KS	Human
149	Y		Itamark Diagnostics LLC	Columbia	MO	Human
150			iVet Professional Formulas	Parkville	MO	Animal
151	Y		J2 Scientific	Columbia	MO	Human
152			Jinyu Bio-technology	Manhattan	KS	Animal
153	Y		Johnson County Clintrials, LLC	Lenexa	KS	Human
154	Y		KALO, Inc.	Overland Park	KS	Plant
155			Kangen Pharmaceutical	Kansas City	KS	Human
156	Y		KanPRO Research, Inc.	Lawrence	KS	Human
157	Y		Kansas City Allergy & Asthma	Overland Park	KS	Human
158	Y	Y	Kansas City Safety Alliance & Research	Lenexa	KS	Human
159			Kansas Regenerative	Manhattan	KS	Human
160	Y		Kantar Health	Overland Park	KS	Human
161	Y		KC Bio, LLC	Lenexa	KS	Human
162	Y	Y	KCAS, LLC	Shawnee	KS	Human
163	Y		Keystone Laboratories, Inc.	Kansas City	KS	Human
164			Kindred Biosciences	Elwood	KS	Animal
165	Y	Y	Knit-Rite, Inc.	Kansas City	KS	Human
166	Y	Y	KrolPharma Resources	Overland Park	KS	Human
167	Y		Lab Corp (was PRL)	Overland Park	KS	Human

#	2018		Company	City	State	Focus
	2015	response				
168	Y	Y	Labconco Corporation	Kansas City	MO	Human
169			Liberty Pharma, Inc.	Liberty	MO	Human
170	Y		Lifeline Foods LLC	St. Joseph	MO	Plant
171	Y		LifeScience Technologies, LLC	Leawood	KS	Human
172	Y	Y	Likarda	Kansas City	MO	Animal
173	Y		Manna Pro Products, LLC	Kansas City	KS	Animal
174	Y		Mars Petcare	Kansas City	MO	Animal
175	Y		Mawd Pathology Group, Inc.	Kansas City	MO	Human
176			Mazen Animal Health	St. Joseph	MO	Animal
177		Y	Medical Device Solutions	Lenexa	KS	Human
178			Medical Positioning	Kansas City	MO	Human
179	Y		Mediware Information Systems, Inc.	Lenexa	KS	Human
180	Y	Y	Merck Animal Health	De Soto	KS	Animal
181	Y		Meta Bioscience LLC	Overland Park	KS	Human
182	Y		Metactive Medical, Inc.	Olathe	KS	Human
183	Y	Y	MFA, Inc.	Columbia	MO	Plant
184	Y	Y	MGP Ingredients, Inc.	Atchison	KS	Plant
185	Y	Y	Microprotein Technologies, Inc.	Lenexa	KS	Human
186	Y	Y	Mid-South Milling Company, Inc.	Kansas City	KS	Plant
187	Y		Millipore Sigma	Lenexa	KS	Human
188	Y		Missouri Cancer Associates LLC	Columbia	MO	Human
189		Y	Mobility Designed	Kansas City	MO	Human
190		Y	Motega Health	Lawrence	KS	Human
191	Y	Y	MRIGlobal	Kansas City	MO	Human
192	Y	Y	MS Biotec	Wamego	KS	Animal
193	Y	Y	Nanova, Inc.	Columbia	MO	Human
194	Y	Y	NBO3 Technologies	Manhattan	KS	Animal
195			Nectagen, Inc.	Kansas City	KS	Human
196	Y		Nestle Purina PTC	St. Joseph	MO	Animal
197	Y		Netsmart	Overland Park	KS	Human
198	Y		Nexus Medical, LLC	Lenexa	KS	Human
199	Y		Nika Biochemicals, Inc.	Overland Park	KS	Animal
200	Y	Y	Norbrook, Inc.	Lenexa	KS	Animal
201	Y		Nostrum Laboratories, Inc.	Kansas City	MO	Human
202	Y		Novadiol, Inc.	Shawnee	KS	Human
203			Now System, Inc.	Kansas City	KS	Human

#	2018		Company	City	State	Focus
	2015	response				
204		Y	Oberd	Columbia	MO	Human
205	Y		Oceanic Medical Products, Inc.	Atchison	KS	Human
206			Omnium LLC	St. Joseph	MO	Plant
207	Y	Y	Oncimmune USA LLC	De Soto	KS	Human
208		Y	One Medicine Consulting	Olathe	KS	Human
209	Y	Y	Orbis Biosciences, Inc.	Lenexa	KS	Animal
210			Orion Integrated Biosciences	Manhattan	KS	Human
211	Y		Ortho-Care, Inc.	Overland Park	KS	Human
212	Y		Osteogenex, Inc.	Overland Park	KS	Human
213	Y		Pace Analytical Services, Inc.	Lenexa	KS	Human
214			Parnell, Inc.	Overland Park	KS	Animal
215	Y		Pathfinder Health Innovations, Inc.	Kansas City	MO	Human
216	Y	Y	PatientsVoices	Parkville	MO	Human
217	Y	Y	PBI/Gordon	Kansas City	MO	Plant
218	Y		PETNET Solutions, Inc.	Overland Park	KS	Human
219	Y	Y	pHLOGISTIX LLC	Fairway	KS	Human
220	Y		Phoenix Medical Research	Prairie Village	KS	Human
221		Y	Phoreus Biotechnology, Inc.	Olathe	KS	Animal
222	Y	Y	Phytotechnology Laboratories, LLC	Lenexa	KS	Plant
223	Y	Y	Pinnacle Technology, Inc.	Lawrence	KS	Human
224	Y	Y	Pivot International	Lenexa	KS	Human
225	Y		Plastikon Healthcare, LLC	Lawrence	KS	Human
226		Y	Play-it Health Adherence Management	Overland Park	KS	Human
227	Y	Y	PRA International	Lenexa	KS	Human
228			PrairieChar	Lawrence	KS	Animal
229			Prommune Innovation in Immunotherapy	Overland Park	KS	Animal
230			Pro-Pet	Kansas City	KS	Animal
231	Y		Propharma Group, Inc.	Overland Park	KS	Human
232			Proteon Therapeutics	Kansas City	KS	Human
233	Y		ProTox Services	Lenexa	KS	Human
234	Y	Y	PTC Labs DBA Genetrait Laboratories	Columbia	MO	Human
235	Y		Pulse Needle Free Systems, Inc.	Overland Park	KS	Animal
236	Y		Purina Mills LLC	St. Joseph	MO	Animal
237	Y	Y	Quality Research Services	Lenexa	KS	Human
238	Y		Quest Analytics, LLC	Independence	MO	Human
239	Y	Y	Quest Diagnostics, Inc.	Lenexa	KS	Human

#	2018		Company	City	State	Focus
	2015	response				
240	Y		QVM Services, LLC	Trimble	MO	Human
241	Y		RBC Medical Innovations	Lenexa	KS	Human
242		Y	Redivus Health	Olathe	KS	Human
243	Y		Rex Animal Health	Kansas City	KS	Animal
244	Y		Rockwell Laboratories, Ltd.	Kansas City	MO	Plant
245	Y		Rowe Neurology Institute	Lenexa	KS	Human
246	Y		SCD Probiotics	Kansas City	MO	Plant
247	Y	Y	Schroer Manufacturing Company	Kansas City	KS	Animal
248			Scientific Analytics, Inc.	Overland Park	KS	Human
249	Y		Sekisui XenoTech, LLC	Kansas City	KS	Human
250			Sickweather	Kansas City	MO	Human
251	Y	Y	Silvergate Pharmaceuticals, Inc.	Overland Park	KS	Human
252	Y	Y	Simcro	Lawrence	KS	Animal
253		Y	Simplified Innovation	Kansas City	MO	Human
254	Y		Sinclair Research Center	Auxvasse	MO	Animal
255	Y		SJK Global, LLC	Olathe	KS	Human
256	Y	Y	Sopharmbique	Atchison	KS	Human
257	Y		Southwest Technologies, Inc.	N Kansas City	MO	Human
258	Y		Sparhawk Laboratories, Inc.	Lenexa	KS	Animal
259	Y		Spinal Simplicity	Overland Park	KS	Human
260	Y		Star Labs (Forge Research)	Clarksdale	MO	Animal
261	Y		Steinlite Corp	Atchison	KS	Plant
262	Y		Stone Manufacturing & Supply Co., Inc.	Kansas City	MO	Animal
263	Y		Stowers Institute For Medical Research	Kansas City	MO	Human
264	Y	Y	SynTech Research	Stilwell	KS	Plant
265	Y		TCI Peptide Therapeutics	Columbia	MO	Human
266			Telecare Global, LLC	Kansas City	MO	Human
267			TeraCrunch	Leawood	KS	Human
268	Y		Teva Pharmaceuticals	Overland Park	KS	Human
269	Y		The Great Plains Laboratory	Lenexa	KS	Human
270			TheraWe Connect	Lawrence	KS	Human
271	Y		Thermo Fisher Scientific, Inc.	Lenexa	KS	Human
272	Y		Tiger Energy Solutions	Columbia	MO	Plant
273		Y	Tonistry, Inc.	St. Joseph	MO	Animal
274	Y		Triad Isotopes, Inc.	Kansas City	MO	Human
275	Y		Trinity Biotech	Kansas City	MO	Human

#	2015	2018		Company	City	State	Focus
			response				
276	Y		Y	TVAX Biomedical, LLC	Olathe	KS	Human
277	Y		Y	UBC - An Express Scripts Company	Kansas City	MO	Human
278	Y			Ventria Bioscience	Junction City	KS	Human
279	Y			Veritas Clinical Specialties	Topeka	KS	Human
280	Y			Veterinary and Biomedical Research Center, Inc.	Manhattan	KS	Animal
281	Y			Veterinary Specialty Products, Inc.	Overland Park	KS	Animal
282	Y			Viracor Eurofins	Lee's Summit	MO	Human
283	Y			Vita A Zine, Inc.	Butler	MO	Animal
284				Vitalograph, Inc.	Lenexa	KS	Human
285	Y			West Device Innovations LLC	Kansas City	KS	Human
286	Y			Wilbur-Ellis Feed	St. Joseph	MO	Animal
287			Y	Worldwide Innovations & Tech	Lenexa	KS	Human
288	Y			Woundcare 360, LLC	Olathe	KS	Human
289	Y		Y	Xenometrics, LLC	Stilwell	KS	Human
290	Y			Zoetis, Inc.	Kansas City	MO	Animal
291	Y			ZuPreem	Shawnee	KS	Animal
292			Y	Zutron Medical	Lenexa	KS	Human

Survey Results

Of the 380 companies targeted for the initial data inquiry, 292 companies listed above (Table 30) were verified as operating in the region, and fit the definition of a life sciences company. Of the 292 companies, about one-third, or 96 company representatives responded to the census survey.

Census questions regarding employment totals, area of focus, and expertise were required to complete the Census online, and were noted as required on the paper or emailed form. The Survey questions (e.g. employment needs, future expansion, and research expenditures) were not required and some companies chose not to disclose that information.

While the total number of respondents in 2018 was lower than in previous Census efforts, the number who completes all of the optional questions has proportionately increased over time. For example, 96% of respondents answered the question regarding future hiring volume, vs. 85% in 2006. Questions regarding sales and research expenditures were answered by 90% of respondents in 2018, compared to only two-thirds of respondents in 2006.

Survey completion challenges nationally have been documented in both the academic and business press. However, this Census process is completed every three years, thus eliciting trust and familiarity to some of the company respondents, as just over half of 2018 respondents also responded in 2015. Regardless, the response gathering process has taken longer with each successive Census effort.

The method preferred by respondents has also changed over time (Table 31):

- Few respondents answered questions over the phone. Forty percent of responses were gathered on the phone in 2006.
- Most company representatives who answered the phone requested the survey be sent to them via email, mail or a link.
- One quarter of responses came via fax or US Mail, which has been consistent over the last three Census periods
- Over half of the responses in 2018 were via the online survey.

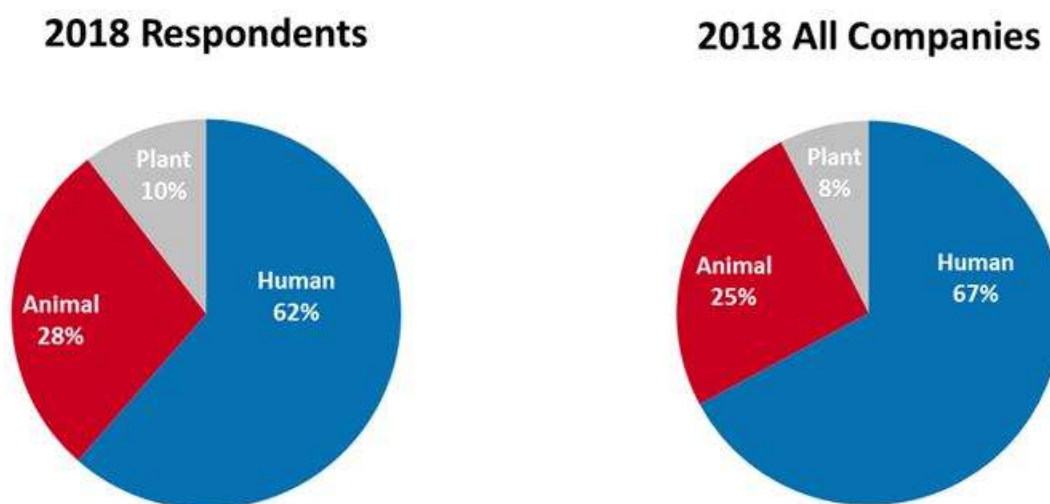
Table 31: Survey Respondents

2018 Survey Respondents	
	# of Companies
By Fax	5
By Email	12
By Mail	19
By Phone	2
By online	58
Total Survey Respondents	96

While the following analysis compares responses over time with some of the questions, only a small number of the responding companies are the same from Census to Census. However, the respondents in each Census do represent a cross section of focus (animal, plant or human focused companies), of industry segments, and of company sizes.

Responses roughly mirrored the composition of the overall life sciences industry in the region, although animal health and plant sciences companies responded at a slightly higher rate than human health companies.

Figure 11: Survey Respondents by Focus



Biotechnology Research and Testing and Healthcare Information Technology companies responded at a lower rate than other industry segments in 2018. Thirty-four percent of the survey responses came from Drugs and Pharmaceutical companies, which make up 28% of the overall companies on the list, for a 40% response rate. Despite these disparities, the respondent base is a proportionately reasonable sampling from all the industry segments.

Table 32: Survey Respondents by Industry Segment

<i>Industry Segment:</i>	<i>Survey Respondents</i>		<i>All Companies</i>		<i>2018 Response Rate</i>
Biotechnology Research and Testing	14	15%	68	23%	21%
Drugs and Pharmaceuticals	33	34%	82	28%	40%
Food Science/Feed or Plant-Based Products	12	13%	37	13%	32%
Health Care IT	8	8%	36	12%	22%
Medical Device	22	23%	57	20%	39%
Organic or Agricultural Chemicals	7	7%	12	4%	58%
Total	96		292		32.9%

Company size is not estimated for non-responding companies, so it is not possible to benchmark responses to the broader company universe. While employment estimates are made for each company on the overall list, the estimates measure employment in the region only, so a large company by revenue could have a small number of employees in the region. Total employment of the respondents represents about two-thirds of the region's total life sciences employment. About 35% of the respondents have less than \$1 million in sales, which is very close to the composition of respondents in the previous four Census reports. The pre-revenue category was added in 2015, to better identify those companies who are still in the

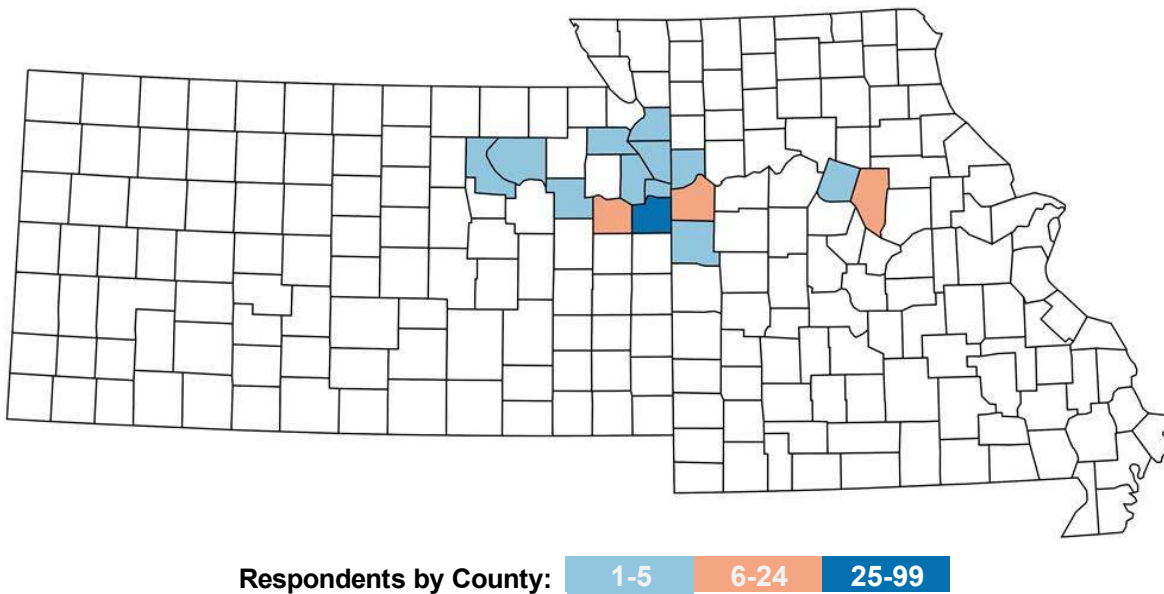
research and development phase versus those just entering commercialization and revenue phases of development

Table 33: Respondents by Company Size

Sales Range	2006		2009		2012		2015		2018	
	Responses		Responses		Responses		Responses		Responses	
Pre-Revenue							15	17%	10	12%
Less than \$100,000	6	9%	14	20%	13	16%	9	10%	9	11%
\$100,000 - \$500,000	6	9%	9	13%	6	8%	5	6%	6	7%
\$500,000 - \$1 million	6	9%	4	6%	7	9%	7	8%	4	5%
\$1 - \$5 million	14	21%	19	27%	18	23%	20	22%	20	24%
\$5 - \$20 million	15	23%	7	10%	16	20%	9	10%	11	13%
\$20 - \$100 million	7	11%	6	9%	10	13%	13	15%	10	12%
+ \$100 million	12	18%	11	16%	10	13%	11	12%	13	16%

As noted in Figure 12, the most populous areas with the most companies generally had the most responses.

Figure 12: Survey Respondents by County



Five of the eight regions mirrored the overall response rate, with about one-third of the companies in the region responding. The Atchison/Leavenworth area had over half of their companies respond, while the Wyandotte County/Kansas City Kansas and St. Joseph, MO region both are under-represented, with less than 20% of the companies responding. (Table 34)

Table 34: Respondents by Region

<i>Region</i>	<i># Responses</i>	<i># of Employees</i>	<i># of Companies</i>
Kansas City Region - KS	3	2,848	20
Atchison/Leavenworth Area - KS	4	413	7
St. Joseph Area - MO	4	388	19
Topeka/Manhattan Area - KS	5	803	13
Lawrence, KS	8	77	22
Columbia Region - MO	10	1,138	26
Kansas City Region - MO	22	13,264	60
Johnson County Region - KS	40	5,297	125

Workforce

Questions regarding workforce and employment projections provide insight into the health of the region's life sciences economy. Parameters surveyed included hiring projections, educational attainment needs, and public workforce system usage. A question was added in 2015 to gauge whether companies are increasing their usage of part-time and temporary workers.

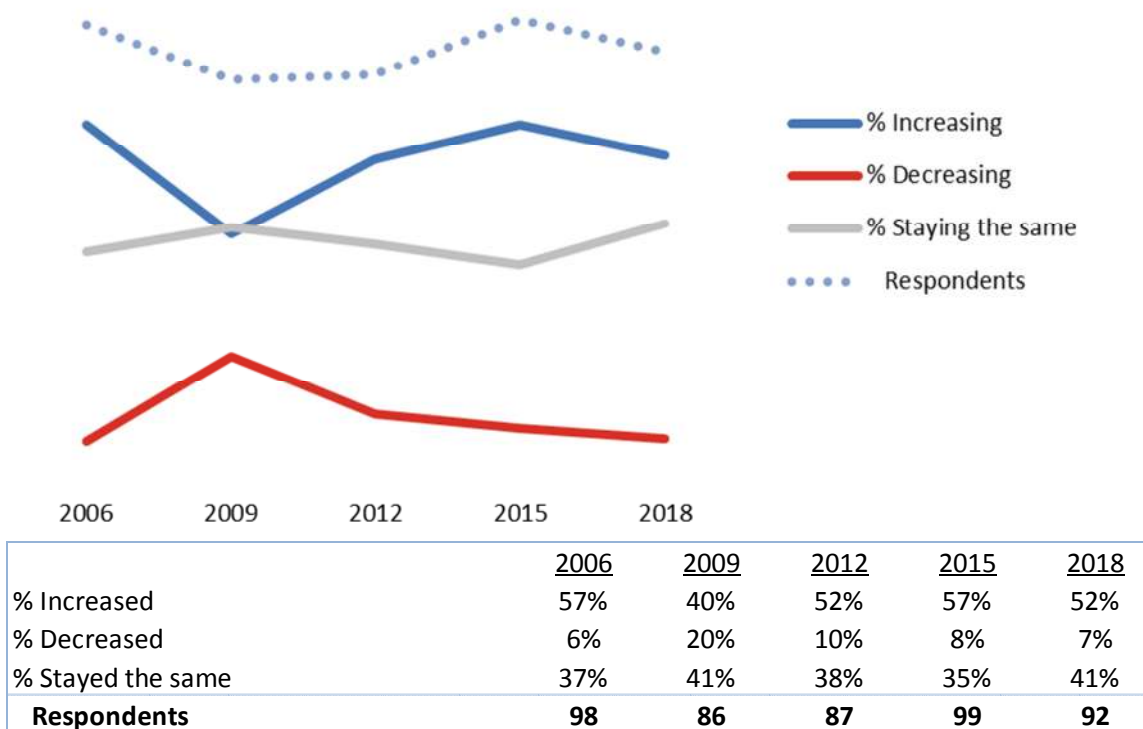
Data regarding company expenditures on research and development and sales information was also requested. These data present a snapshot of the current state of the life sciences economy and must not be over-interpreted or form the basis of predictions regarding the future economic health of the regional life sciences industry.

Several factors impact the quality of information provided by respondents and include perceived confidentiality concerns, respondent's limited knowledge of company's workforce data, and/or incomplete corporate planning processes that make for unreliable workforce estimates/projections.

Survey respondents were not required to provide job titles, so responses were not quantified based on whether the person responding was the most knowledgeable person about all functional areas of the company. Smaller company responses were typically provided by the company owner, but for larger companies, respondents varied, although human resources or public communications professionals were the most common titles cited. Respondents were asked to provide employment totals for this region only, but in the case of companies with a national or global footprint, some responses may reflect a wider geographic area than that represented in this census. Companies with multiple locations may or may not have tallied all employment in the census region and may have reported for their location only.

Despite these caveats, companies hiring new employees can be viewed reasonably as optimistic about the company's future prospects. The current results indicate that many of the region's life sciences companies are growing and adding employment.

Figure 13: Change in Employment in the Last Year



Over half of the 92 survey respondents who answered the question about employment changes in the past year reported an increase in employment. This number is down slightly from 2015 responses, but only six companies, or seven percent of the respondents reported a decrease in staff, a metric that continues to improve following the recession impact noted in 2009. (Figure 13)

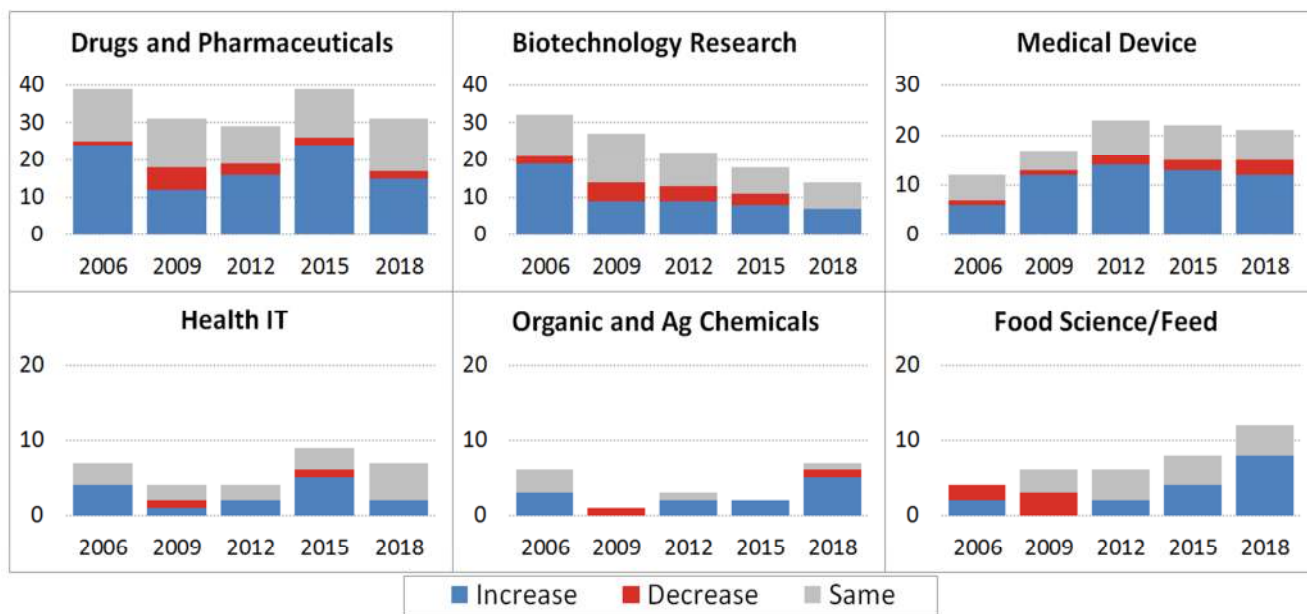
Change in employment was examined by industry segment, to determine if employment changes were more prevalent by segment. In 2018, the Medical Device segment led in decreases in staff, with three of the respondents indicating decreases, and slightly fewer companies with employment increases over the past two Census periods. Food Science and Organic and Agricultural Chemical companies have higher rates of increases, relative to unchanged or decreasing employment. In all but the Healthcare IT segment, 50% or more of the responding companies in that segment added employees. (Table 35)

Table 35: Employment Change by Industry Segment

Industry Segment	#			
	Responses	Increased	Decreased	Steady
Biotechnology Research and Testing	14	7 / 50%	0 / 0%	7 / 50%
Drugs and Pharmaceuticals	31	15 / 48%	2 / 6%	14 / 45%
Food Science/Feed	12	8 / 67%	0 / 0%	4 / 33%
Health IT	7	2 / 29%	0 / 0%	5 / 71%
Medical Device	21	11 / 52%	3 / 14%	7 / 33%
Organic and Agricultural Chemicals	7	5 / 71%	1 / 14%	1 / 14%

Change in employment was examined by industry segment, to determine if employment changes were more prevalent by segment. (Figure 14) In 2018, the Medical Device segment led in decreases in staff, with three of the respondents indicating decreases, and slightly fewer companies with employment increases over the past two Census periods. Food Science and Organic and Agricultural Chemical companies have higher rates of increases, relative to unchanged or decreasing employment.

Figure 14: Change in Employment by Industry Segment



Biotechnology and Research responses continue to show smaller numbers of companies who have increased staff over time. Drug and Pharmaceutical companies show the most fluctuation over time, although in 2018, 15 noted increases and 14 noted no change, which is less positive when compared to the same proportions in 2015. While these are small sample sizes for each of these industry segments, they do indicate employment change trends over time.

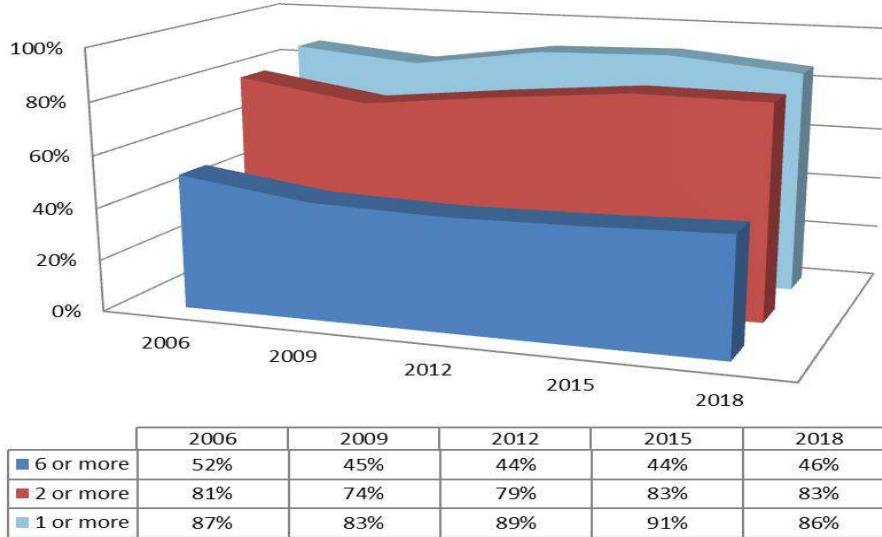
Employment Projections

Hiring plans are a gauge of optimism regarding company growth prospects. Companies were asked to consider their hiring plans over the next 36 months, and 92 companies provided a response.

Company respondents were slightly less optimistic in 2018 than in 2015, with 79 (86%) indicating plans to hire one or more employees in the next three years, compared to 86 (91%) in 2015. Only one respondent noted plans to cut staff, and 14% are not anticipating growth in employment. (Figure 15)

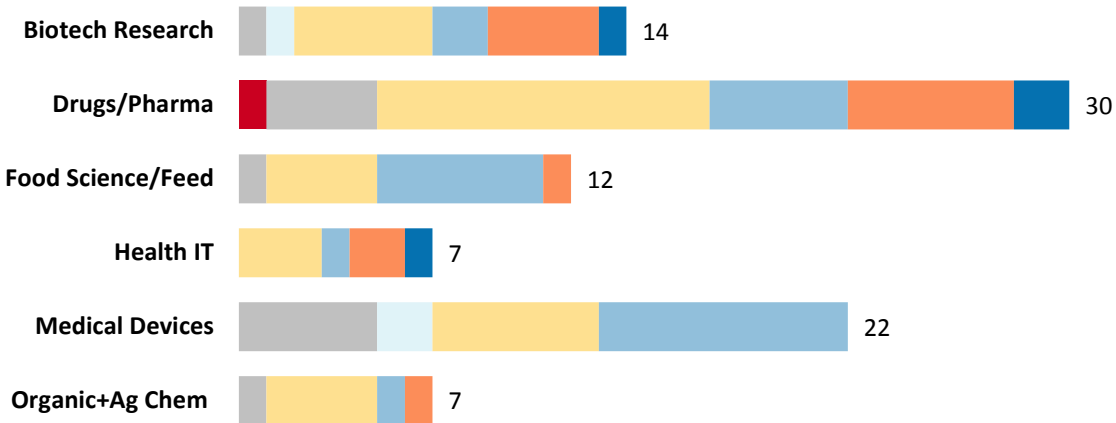
The proportion of respondents planning to add six or more employees has been fairly steady through the last four census periods. Since 2006, four respondents each year have projected plans growth by more than 100 companies over the next three years.

Figure 15: Hiring Plans in the Next 36 Months



While the low number of responses in the smaller industry segments prevent reading too much into the results of the analysis, Health IT respondents showed optimism, with all respondents projecting employment growth in the next three years. (Figure 16) Respondents in the medical device segment appear less optimistic, but overall companies in this segment are small (see Table 15), which could affect the number of additional hires.

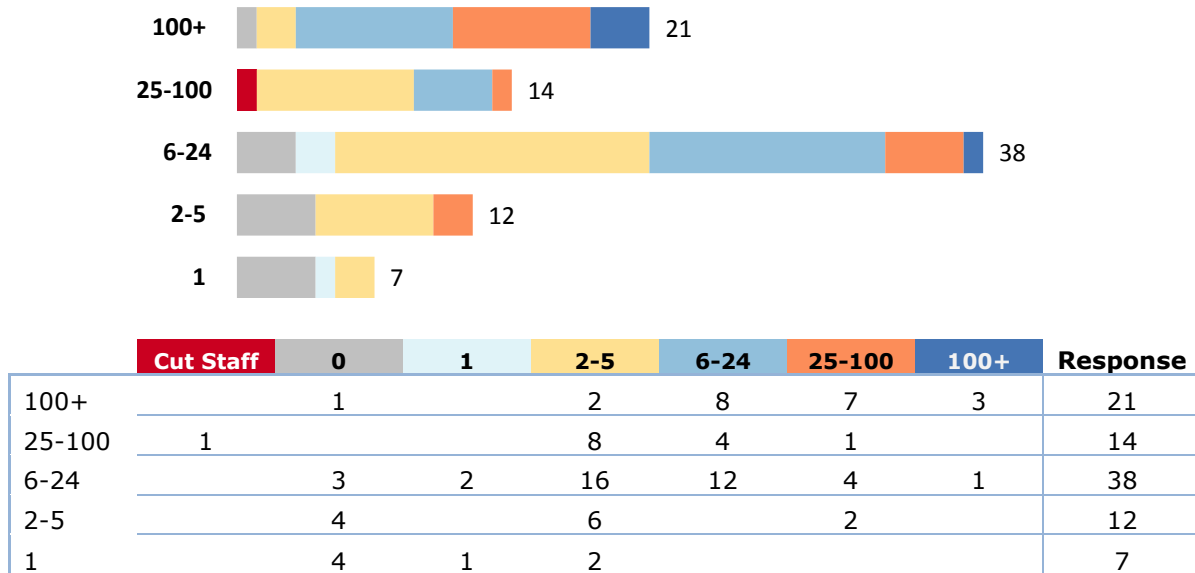
Figure 16: Employment Growth Projections by Industry Segment



	Cut Staff	0	1	2-5	6-24	25-100	100+	Response
Biotech Research		1	1	5	2	4	1	14
Drugs/Pharma	1	4		12	5	6	2	30
Food Science/Feed		1		4	6	1		12
Health IT				3	1	2	1	7
Medical Devices		5	2	6	9			22
Organic+Ag Chem		1		4	1	1		7

Not surprisingly, the largest company respondents projected larger increases than small companies, in general. However, two company respondents with fewer than five employees anticipate hiring of 25 or more, and one respondent in the the 6-24 employee category projected hiring over 100 employees in the next three years. (Figure 17)

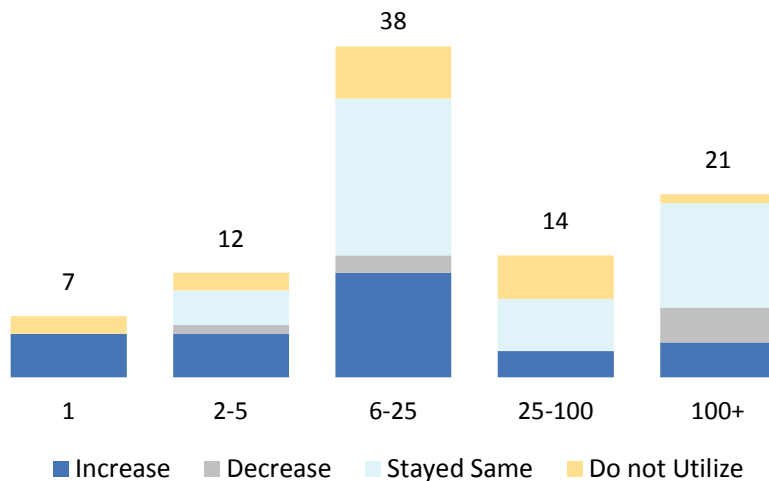
Figure 17: Employment Growth Projections by Size of Company



Temporary or Part-Time Workers

Evidence of increasing reliance on temporary or part-time workers across many US industries led to the addition of this question to the survey portion of the Census beginning in 2015. Small companies appear to be increasing the use of such workers, although some respondents from each company size segment reported an increase. (Figure 18)

Figure 18: Use of Part Time or Temporary Workers by Company Size

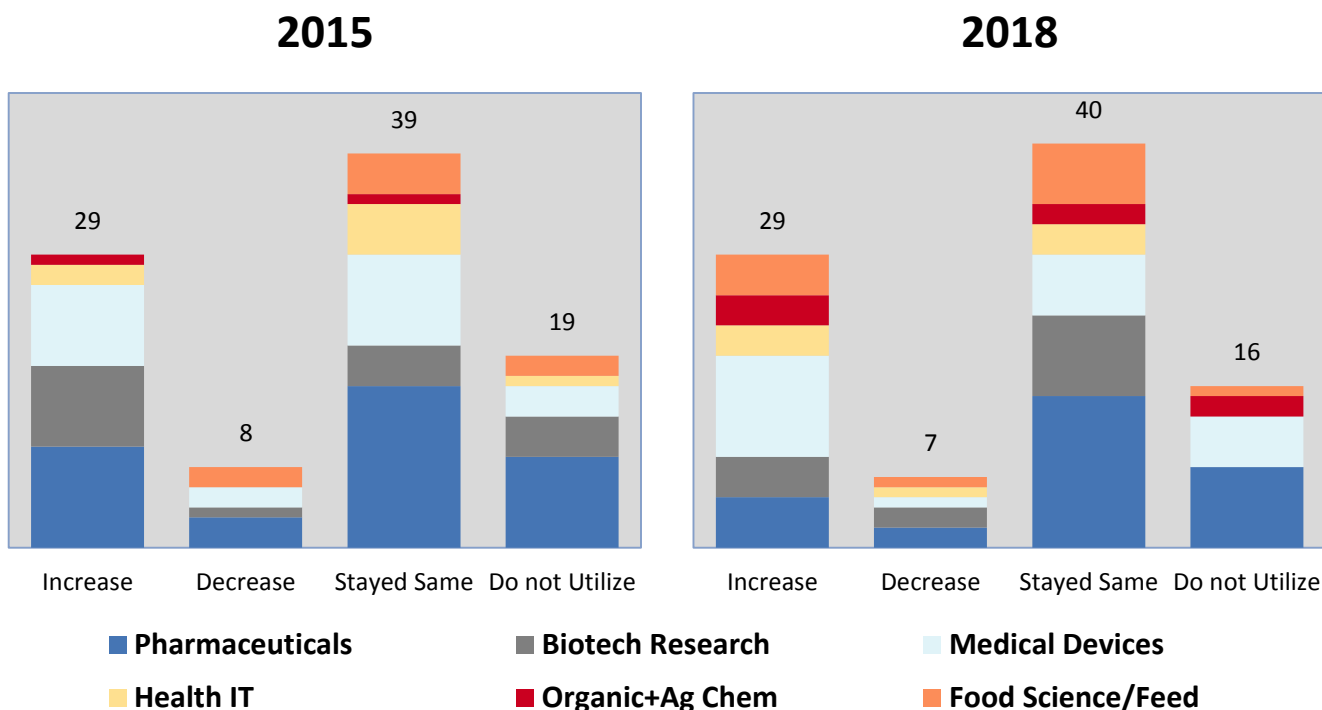


Typically, temporary workers are not reported as employees, which could improperly indicate a decline in activity or sales in companies with decreases in reported employees who are also increasing the use of temporary workers. About one-third of overall respondents indicated an increase in utilizing temporary or part-time workers, and only 17% of respondents stated that they did not utilize any of these kinds of workers.

The utilization of such workers is common in seasonal industries such as retail and tax services. In life sciences, temporary workers may be used for short term needs, or could be the result of uncertainty regarding the need for permanent or full-time employees. Use of part-time workers could signal a cost saving measure, or a need for flexibility.

In comparing overall responses from 2015 to 2018, overall utilization responses are similar in both Census periods, but some changes by segment can be noted. Fewer respondents from the Drugs and Pharmaceutical and Research and Testing segments note increasing utilization in 2018, while Medical Device respondents show increasing utilization of such workers since the 2015 Census report. (Figure 19)

Figure 19: Use of Part Time or Temporary Workers by Industry Segment



Workforce Educational Requirements

With the Kansas City regional unemployment rate dipping below 3% as this report is published, anecdotal evidence of worker shortages abounds. Even in previous Census reports when the unemployment rate was higher, some employers noted shortages of qualified applicants for various positions in various industry segments.

To quantify workforce needs, survey respondents were asked about their greatest workforce needs in the next 36 months by level of educational attainment. Quantifying educational

attainment needs does not provide the full picture of employment needs, as specific examination of position requirements and degrees would entail a much more detailed survey. However, the educational attainment data does provide a high-level overview of the prevalence and kinds of needs of the respondent companies.

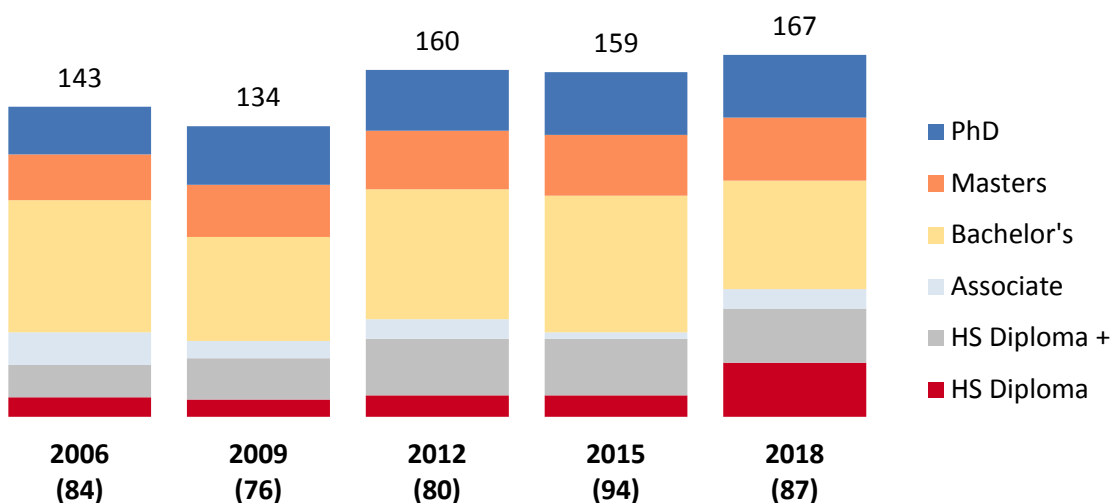
Companies reporting position needs were not limited to a single answer, so total responses exceed the number of companies responding. (Table 36) In 2018, 87, or 90% of survey respondents listed a record 167 position needs. Roughly a third of respondents noted demand for positions at both ends of the educational spectrum, and over half noted demand for a Bachelor’s degree level position.

Table 36: 2018 Educational Attainment Needs

Education Level	#	%
High School Diploma	25	29%
Some Post High School Training	25	29%
Associate Degree	9	10%
Bachelor’s Degree	50	59%
Masters	29	33%
PhD	29	33%
Total Responses	167	
Companies Responding	87	

When analyzing the responses to this question over time, not only are the total number of responses indicating position needs increasing, but demand for high school diploma positions, and a high school diploma plus some formal training is rising, while demand for a Bachelor’s degree level position has declined relative to other position needs. (Figure 20) The number of companies responding is listed below the response year. Demand for Master’s and Ph.D. level positions has remained fairly stable through all five Census periods, after a slight increase in 2009. Associate degree positions have been in least demand relative to the other positions since 2006.

Figure 20: Educational Attainment Needs over Time



It should be noted that respondents were asked for position demand over the next 36 months, which assumes that these responses include plans for anticipated growth, and/or anticipated retirements, so the needs may not reflect current employment demand as of the time of response.

Company respondents with 6-24 employees provided nearly 45% of the total responses, listing 74 anticipated position needs. Company respondents from all company sizes noted demand for Master's and PhD level positions. Higher demand relative to the number of companies responding was noted for High School, or Some Post High School Training level positions in companies with more than 25 employees.

Table 37: Educational Attainment Needs by Employment Size

Current Employment (# answered)	HS DIPLOMA	POST HS	AD	BA/BS	MS	PhD	Total
1 (5)	1	0	0	2	1	3	7
2-5 (10)	1	0	0	4	5	4	14
6-24 (38)	8	12	5	25	13	11	74
25-100 (14)	6	7	1	7	2	3	26
100+ (20)	8	6	3	13	8	8	46

When examining educational attainment needs by Industry Segment, positions were listed by segment and by level of educational attainment. In the Drugs and Pharmaceuticals segment, 29 respondents provided 60 responses to the question asking about their greatest workforce needs. For a position need requiring a High School diploma, for instance, seven company respondents, or 24%, chose this option. The most frequently cited need by Pharma respondents was a Bachelor's degree, cited by 18 company respondents, or 62%. Because company respondents could choose more than one option for this question, totals do not equal 100%.

Table 38: Educational Attainment Needs by Industry Segment

Workforce Needs:	Biotech Research		Drugs/Phar ma		Feed		Health Care IT		Med. Device		Org + Ag Chem	
# Co.'s Responding	12		29		12		7		20		7	
HS	2	17%	7	24%	3	25%	2	29%	7	35%	3	43%
POST HS	2	17%	9	31%	4	33%	0	0%	7	35%	3	43%
AD	0	0%	4	14%	1	8%	0	0%	2	10%	2	29%
BA/BS	8	67%	18	62%	5	42%	4	57%	12	60%	4	57%
MS	4	33%	11	38%	4	33%	3	43%	3	15%	4	57%
PhD	3	25%	11	38%	6	50%	3	43%	4	20%	2	29%
Total # Responses	19		60		23		12		35		18	

Drugs and Pharmaceutical and Organic or Agricultural Chemical company respondents chose the most position needs, relative to the number of respondents, with both averaging more than two responses per company. The small number of responses per segment makes direct

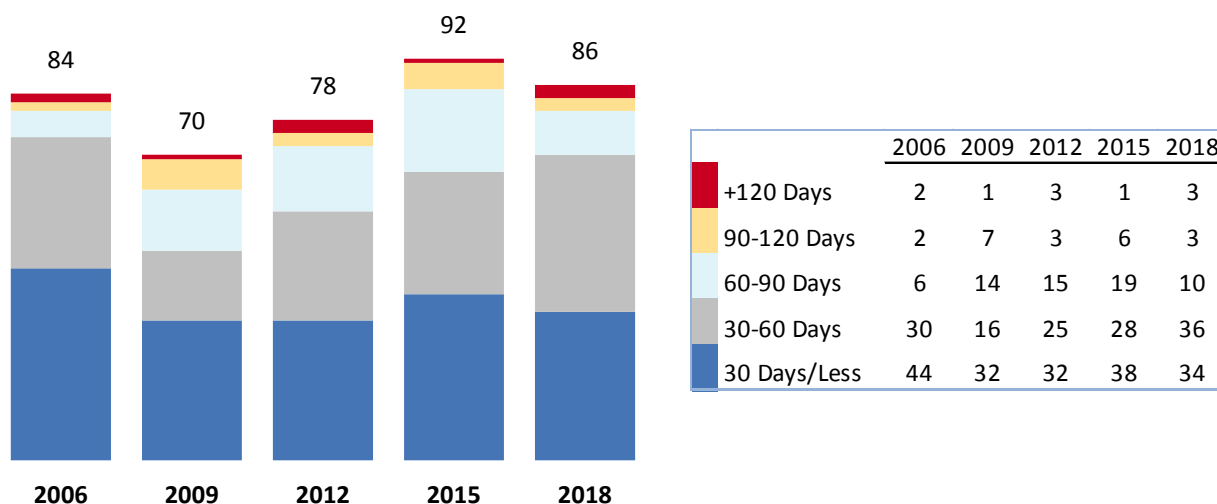
comparisons to prior Census data difficult, but some decline in demand for the Bachelor’s degreed positions can be noted in the Drugs and Pharmaceutical and Medical Device industry segment, relative to other position needs.

Workforce Vacancies

The definition of ‘entry level positions’ can vary from segment to segment, and even from company to company. Typically, the entry level position supports operations, brings new ideas or input, and can be developed into the next generation of the company’s workforce and culture. Challenges with recruiting and filling entry level positions can signal opportunities to develop new workforce initiatives to respond to these challenges.

The Census survey asked respondents to provide an average length of vacancy for entry level positions at their company based on a range of time periods. (Figure 20) The workforce vacancy average captures responses for entry level positions only. Companies seeking specialized advanced degrees or experience are likely to have different lengths of vacancies than for entry-level positions.

Figure 21: Average Length of Entry-level Vacancies over Time



Over 80% of the census respondents reported an average length of time to fill employment vacancies of 60 days or less, although 42% of respondent’s noted a 30-60 day time frame to fill entry level vacancies, compared to only 31% in 2015. About 60% of respondents noted a time longer than 30 days to fill vacancies, about the same percentage as in 2012 and 2015, compared to only 54% in 2009 and 48% in 2006.

There was no predominant geographical area of those reporting longer employment vacancies. (Table 39) The highest number was in Johnson County, although Johnson County is also home to the highest number of total companies. Generally, the low numbers of respondents with average vacancies over 60 days prevents drawing firm conclusions from this data.

Table 39: Workforce Vacancies > 60 Days by Region

Region	Answered Question	# responses	%
Atchison/Leavenworth Area - KS	3	1	33%
Columbia Region - MO	9	1	11%
Topeka/Manhattan Area - KS	5	1	20%
Johnson County Region - KS	36	8	22%
Kansas City Region - KS	3		0%
Kansas City Region - MO	20	2	10%
Lawrence, KS	6	1	17%
St. Joseph Area - MO	4	1	25%

Employers seeking to fill entry level positions in a difficult job market may choose to recruit and hire employees from outside the region. Additionally, a lack of local candidates can also signal workforce development opportunities to focus on educational opportunities and programs of study to meet employer needs.

Respondents were asked about the need to recruit workers for entry level positions from outside the region due to the quality and/or quantity of the available workforce in the last 24 months. While this question is answered once per company, it does not capture the entire magnitude of hiring challenges. For example, a company looking to recruit for dozens of positions will have the same answer as the five-person company looking to hire one person. Nevertheless, fewer companies responded that they never recruited outside the region in 2018 than in 2015. (Figure 22 and Table 40)

Figure 22: Companies Recruiting Outside the Region

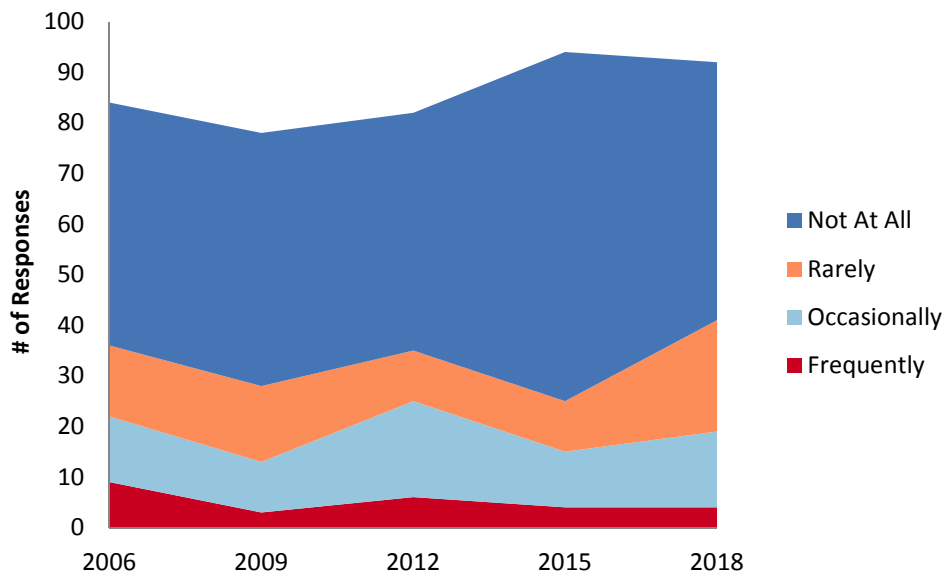


Table 40: Companies Recruiting Outside the Region

Response	2006		2009		2012		2015		2018	
Not At All	48	57%	50	60%	47	57%	69	73%	51	55%
Rarely	14	17%	15	18%	10	12%	10	11%	22	24%
Occasionally	13	15%	10	12%	19	23%	11	12%	15	16%
Frequently	9	11%	3	4%	6	7%	4	4%	4	4%
Total Responses	84		84		82		94		92	

The geographic region of the respondents who noted the need for recruiting outside of the region either occasionally or frequently was examined to see if there was a specific area within the region with higher levels of outside recruiting. (Table 41) With the small number of companies reporting recruitment outside of the region, drawing conclusions from this data is difficult. While Johnson County had the highest number of companies recruiting outside the region, they also had the highest number of both life sciences companies and census respondents to this question.

Table 41: Location of Companies Recruiting Outside the Region

County	Occasionally	Frequently
Atchison (KS)	1	
Boone (MO)	1	
Clay (MO)		1
Douglas (KS)	2	
Johnson (KS)	8	2
Leavenworth (KS)	2	
Platte (MO)		1
Wyandotte (KS)	1	

Company respondents were asked, “Would you be willing to have a representative of your company serve in an advisory capacity to inform and influence regional life sciences workforce development efforts?” Compared to 2015, the respondents indicated an increase in interest in participating on an advisory committee to address life sciences workforce issues in the region. Thirty-eight of 96 census respondents answered in the affirmative and provided contact information for future participation, compared to 29 in 2015.

The highest response rates came from those in companies of 6-24 employees and from those with more than 100 employees. Affirmative responses came from respondents in all industry segments, but proportionally, the most interest came from respondents in the Biotechnology Research and Testing and Health Care Information Technology segments. Overall, 38 companies wishing to be engaged indicates that companies are interested in actively participating in efforts to prepare future employees with appropriate skills necessary for a growing life sciences industry.

When asked about their usage of the public workforce system, three-quarters of the respondents indicated that they were either not using the system, or not familiar with it. (Table 42) The ‘Not Familiar’ response was higher than in past Census reports and only one respondent indicated frequent use of the public workforce system. Several published studies

indicate that underutilization of public workforce development programs is common across businesses, with the complexity of the system, perceived low value, or a lack of knowledge of available programs cited as reasons for underutilization. The survey results indicate an opportunity for improving access to and awareness of these programs.

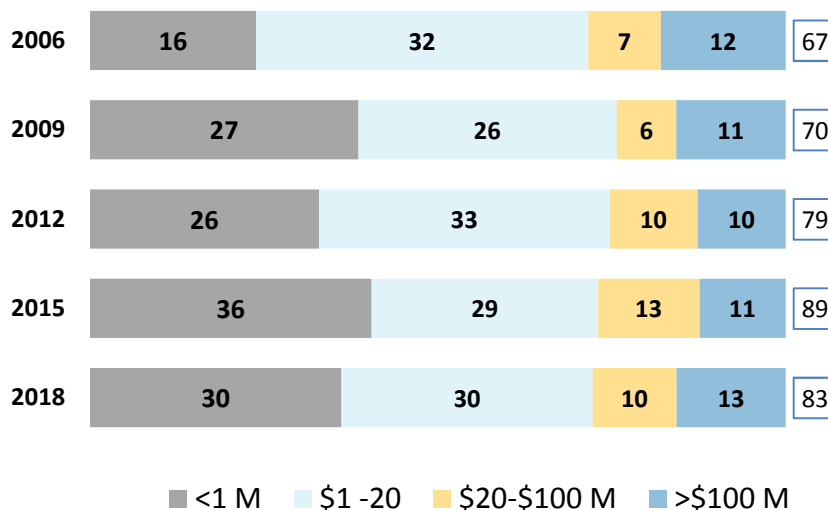
Table 42: Use of the Public Workforce System

Use of the Public Workforce System										
Response	2018		2015		2012		2009		2006	
Not At All	50	55%	63	66%	43	52%	39	52%	54	64%
Rarely	9	10%	10	11%	9	11%	13	17%	7	8%
Occasionally	12	13%	12	13%	18	22%	9	12%	8	10%
Frequently	1	1%	4	4%	6	7%	6	8%	7	8%
Not Familiar	19	21%	6	6%	7	8%	8	11%	8	10%
Total Responses	91		95		83		75		84	

Sales and Research Expenditures

Sales data provides one indicator of industry size and scope. Respondents were asked to provide revenue estimates for their companies in each Census year. While the respondent base may not be representative of the entire region, the respondent revenue base has been proportionally similar over all 5 Census periods. In each Census year, between 72-76% of respondents reported revenues of less than \$20 million. (Figure 23)

Figure 23: Respondent Revenue Ranges over Time



Respondents were not asked for sales data exclusive of the Census region; companies may generate revenue nationally or globally, but the responses provide insight into company size. While sales totals for the previous Census periods are provided for comparison purposes, it should be noted that while the industry focus and expertise composition of the industry in the region are reasonably similar, the individual companies are different.

In comparing the individual company responses between 2015 and 2018, of those 40 companies who answered the question in both census periods, 32 reported no change in their revenue category, five reported a higher revenue category from 2015, and three reported a decrease in revenue. Responses from seven company respondents that were pre-revenue in 2015, who also responded in 2018 indicated that five of these seven companies are still pre-revenue, and two reported a revenue category three years later.

A review of the reported sales ranges by industry segment shows that all of the pre-revenue respondents are in the Drugs and Pharmaceuticals, Research & Testing and Medical Device segments. Just under half of the Drugs and Pharmaceuticals segments reported less than \$1 million in revenue. While a small number of respondents, over 50% of the Organic or Agricultural Chemicals and Food Science/Feed respondents reported over \$20 million in revenues.

Table 43: 2018 Sales by Industry Segment

Sales by Area of Expertise (number of respondents)	Pre-Revenue	< \$100k	\$100-\$500k	\$500k - \$1M	\$1-\$5M	\$5-\$20M	\$20-\$100M	>\$100M
Biotech Research (14)	2	1	1	0	4	2	2	2
Drugs/Pharma (28)	5	3	3	2	4	4	3	4
Food Science/Feed (9)	0	0	0	1	2	1	2	3
Health Care IT (6)	0	3	1	0	1	0	0	1
Medical Device (20)	4	2	1	1	6	3	3	0
Organic + Ag Chem (6)	0	0	0	0	2	1	0	3
Totals	11	9	6	4	19	11	10	13
% of Total Respondents	13%	11%	7%	5%	23%	13%	12%	16%

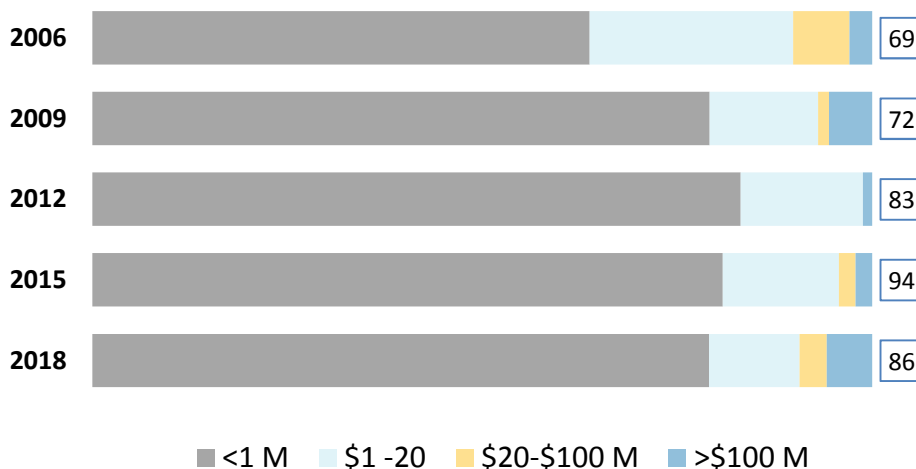
Respondents were asked to report a category of research expenditures in order to gauge the level of investment in this vital activity. Eighty-six companies reported estimated research expenditures in 2018, and 85 provided an estimate of research expenditures for 2019. Research expenditures are not provided for the region only, so company responses are not a gauge of local activity, but provide insight into the level of research activity in each industry segment. (Table 44)

Table 44: 2018 Research Expenditures

Industry Segment (total # responses)	no research	< \$100k	\$100-\$500k	\$0.5 - 1M	\$1-5M	\$5-20M	\$20-100M	>\$100M
Biotech Research (14)	1	4	5	1	1	0	0	2
Drugs/Pharma (27)	4	3	8	4	3	2	2	1
Food Science/ Feed (11)	0	2	4	3	0	1	1	0
Health Care IT (7)	0	4	1	1	0	0	0	1
Medical Devices (21)	3	4	7	5	2	0	0	0
Organic + Ag Chem (6)	1	2	1	0	1	0	0	1
Totals	9	19	26	14	7	3	3	5
% of Total Respondents	10%	22%	30%	16%	8%	3%	3%	6%

When reviewing both current and expected research expenditures, it is possible to review past results, but such comparisons should take into consideration that the respondents are not the same from census period to census period. However, of the 42 company respondents who provided a research expenditure estimate in both 2015 and 2018 Census periods, 16 reported a higher research category than in 2018, 20 reported no change, and 6 reported a lower category of research spending in 2018 than in 2015.

Figure 24: Research Expenditures over Time



In the 2012 Census, a category for research expenditures, 'no Research', was added to distinguish between those who were not performing any research and development from those who were doing so at a low level. In comparing results over the past census periods, the percentage of respondents spending over \$1 million in research during the census year was highest in 2006, but was higher in 2018 than in 2015 and 2012 Census periods.

Table 45: Research Expenditures over Time

	no research	< \$100 k	\$100-\$500k	\$0.5-1M	\$1-5M	\$5-20M	\$20-100M	>\$100M
Totals 2006		22	13	9	13	5	5	2
		32%	19%	13%	19%	7%	7%	3%
Totals 2009		28	22	7	7	3	1	4
		39%	31%	10%	10%	4%	1%	6%
Totals 2012	13	21	24	11	10	3	0	1
	16%	25%	29%	13%	12%	4%	0%	1%
Totals 2015	15	26	24	11	9	5	2	2
	16%	28%	26%	12%	10%	5%	2%	2%
Totals 2018	9	19	26	14	7	3	3	5
	10%	22%	30%	16%	8%	3%	3%	6%

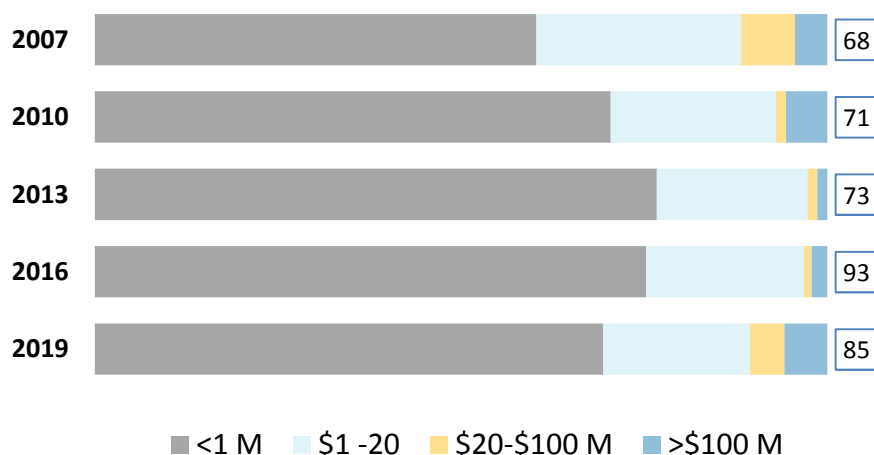
Respondents were asked to provide an estimate, by range, for research expenditures in 2019 in order to assess company outlook for research. Eighty-five companies responded to both the current research expenditure question and the expected research expenditure question for 2019. Projections show a marked increase in the number of company respondents reporting projected expenditures of \$1-5 million relative to current year expenditures. One company in the \$1-5 million category projects research to grow to \$20-100 million in 2019.

Table 46: Research Projections for 2019

Research Expenditures	no research	< \$100k	\$100-\$500k	\$0.5 - 1 M	\$1-5M	\$5-20M	\$20-100M	>\$100M
Projected Totals 2019	8	13	27	11	14	3	4	5
	9%	15%	32%	13%	16%	4%	5%	6%
Research Expenditures 2018	9	19	26	14	7	3	3	5
	10%	22%	30%	16%	8%	3%	3%	6%

Research projections for 2019 show a marked increase in the number of company respondents reporting projected expenditures of \$1-5 million relative to current year expenditures, and 31% of company respondents project research expenditures of over \$1 million in 2019, compared to 20% reporting \$1 million or more in expenditures for 2018.

Figure 25: Research Expenditure Projections over Time



Respondents are reporting a greater proportion of expenditures over \$1 million compared to the past 3 Census periods, with 9 companies projecting expenditures over \$20 million in the next year, compared to 3 respondents in the 2015 Census, and 2 in the 2012 Census. These results indicate expectations of expanding research budgets, and represent the highest number of companies projecting budgets over \$1 million since the 2006 Census.

Table 47: Research Expenditure Projections over Time

Research Projections for the Following Year								
	<i>None</i>	<i>< \$100 k</i>	<i>\$100- \$500k</i>	<i>\$0.5 - 1 M</i>	<i>\$1-5M</i>	<i>\$5-20M</i>	<i>\$20- 100M</i>	<i>>\$100 M</i>
2006 Respondents		20	13	8	11	8	5	3
% of total respondents		29%	19%	12%	16%	12%	7%	4%
2009 Respondents		25	19	6	12	4	1	4
% of total respondents		35%	27%	8%	17%	6%	1%	6%
2012 Respondents		21	21	14	13	2	1	1
% of total respondents		29%	29%	19%	18%	3%	1%	1%
2015 Respondents	14	20	25	11	13	7	1	2
% of total respondents	15%	22%	27%	12%	14%	8%	1%	2%
2018 Respondents	8	13	27	11	14	3	4	5
% of total respondents	9%	15%	32%	13%	16%	4%	5%	6%

Summary and Observations

The Census effort is commissioned as an asset mapping project to delineate the number and kinds of companies in the region, broad industry developments and transactions that impact the region, and the supporting organizations, health care systems and universities that underpin the regional life sciences economy. The purpose of the Census is not to develop recommendations, but some conclusions can be drawn from a review of the data presented in the report.

- Continued double digit percentage growth in both number of life sciences companies and the number employed within the industry confirms this industry as a globally-competitive sector and a primary focus for the KC Rising initiative.
- The line between industry segments continues to blur as pharma companies enter data services, physician decision support and population health businesses. Medical device companies are collaborating with researchers who can utilize device data for improving outcomes and seeking to integrate artificial intelligence predictive analytics software into their device offerings. Amazon, Alphabet and Apple are all now players in the healthcare market, resulting in the potential for even more disruption in the future.
- The region is well positioned to capitalize on the evolving health care landscape as entire systems are re-engineered to focus on patient-provider experience, improve transparency and competitiveness in pricing, and advance new discoveries. Assets such as the Stowers Institute, expanding university research centers, the National Cancer Institute (NCI) designated University of Kansas Cancer Center, the expanding Children's Research Institute, and more, all contribute to a growing foundation for research and innovation in the region.
- The region boasts strong entrepreneurial ecosystem, bolstered by the Kauffman Foundation, KC SourceLink and a myriad of support offerings that provide services and funding sources to advance early stage companies. The number of incubation and acceleration options for companies are growing in the region. Half of the 49 companies currently located at the region's incubators, accelerators, or business parks were there in 2015, and several have been present since 2006.
- Capital, the lifeblood of developing companies, continues to be a regional challenge. Investor interest in the life sciences is growing, with total funding nationally nearly doubling since 2015, but at least a third of the total investments have gone to California companies, and disproportionate funding on the Coasts has been documented for over two decades. Additionally, evidence points to much of the increased capital being allocated to larger deals, and a decline in early stage funding. Increasing capital provider presence in the region over the last three years is encouraging but continued progress is required to ensure that the 100 life sciences companies with less than five employees in the region survive, stay, and grow, in the region.
- Collaboration appears to be the new buzzword in the industry, as innovative companies recognize that successful partnerships can speed the advance of innovations to the marketplace. Providing opportunities for stronger collaboration and appropriate matches between those needing expertise and those providing it will be an important key to future growth.

- Construction of the National Bio and Agro-defense Facility in Manhattan, KS continues to move ahead, with full completion expected within the next 4-5 years. Interest in the region from companies who could support or advance technologies for this facility is growing, although the full impact of this facility is still in the early stages of being realized.
- While this survey effort is not comprehensive in evaluating the workforce needs for the region's companies, increasing position needs, and increasing length of time to fill vacancies for entry level positions, point to the need to step up workforce development efforts. Workforce challenges in the region have also been examined in more detail by KC Rising, Gradforce KC and others. At least 13 company expansions, as detailed in the report, point to the need to improve the educational pipeline to ensure that growing companies have access to appropriate talent.
- Competitive pressures are also fueling some mergers, reorganizations and relocations in the region. With nearly two-thirds of the region's life sciences company workforce employed by only 11 companies, this leaves the region vulnerable if large employers pull up stakes or close. With a growing proportion of the overall company list being companies with fewer than 25 employees, efforts to bolster these companies to expand employment can help to reduce vulnerability.
- The region is facing an opportunity to achieve growth and capitalize on a life sciences industry that is changing rapidly. The opportunity depends on the region's ability to attract capital to support business growth, create and recruit students for talent development pathways, and to attract and retain talent and support early-stage businesses. The region has seen numerous successes over the past three years and is well-positioned to address future challenges.

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- University of Kansas
- University of Kansas Medical Center
- University of Missouri-Columbia
- University of Missouri-Kansas City

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Name	Organization
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Sarah Mote	UMKC Innovation Center

APPENDIX

<i>Companies Listed in 2006, Still Operating in the Region</i>		
AAI Pharma (Now KCAS)	Deciphera Pharmaceuticals	Oceanic Medical Products
Acceleration LLC	Disposable Instrument Company	Onclmmune
Addison Biological Laboratory	DurrieVision	Paternity Testing Corp. (Now PTC Labs)
Advanced Clustering Technologies	Ecto Development Corporation	PBI/Gordon Corp
AgriLabs	Felton Int'l (now Pulse Needle-Free)	PETnet Pharmaceuticals Inc.
Albaugh Inc.	Forage Research	Pharmion (now Celgene)
Alburtylab	Gaddy & Associates	Phoenix Pharmaceutical
Allied Monitor Inc.	Great Plains Laboratory	PRA International
Ameri-Pac (now Wilbur-Ellis Feed)	Hans Rudolph Inc.	Professional Toxicology Services
ABC Labs (Now EAG Laboratories)	Heart of America Eyecare, PA	ProPharma Group
Antech Diagnostics	HEMCO Corporation	Proteon Therapeutics
B F Ascher & Company, Inc.	Hennessy Research Associates	Purina Mills LLC
Bayer CropScience LP	Hill's Pet Nutrition Inc.	Quality Research Services
Bayer Animal Health Division	Hunkeler Eye Institute	Quest Diagnostics
Becker Underwood (now BASF)	IdentiGEN	Quintiles Inc. (now IQVIA)
Beckloff Assoc. (Now Cardinal Health)	Immvac Inc.	QVM Services, LLC
Biomune Co. (now Ceva)	Inovatia Laboratories	REMEL (now Thermo Fisher)
Biosyntropy Solutions (now SCD Probiotics)	Intervet Inc.(now Merck)	SAFC Biosciences
BioZyme Inc.	Ioditech	Sceptor Industries (now Evogen)
Blue Endo	Ivy Animal Health (now Elanco)	Sinclair Research Center Inc.
Boehringer Ingelheim Vetmedica	KALO Agricultural Chemicals	Sparhawk Laboratories Inc.
Brown Medical Industries (now Brownmed)	Kansas City Allergy & Asthma Associates	Steinlite Corporation
Cancer Research Center	KC BioMediX (now Innara)	Stone Manufacturing & Supply
Caravan Ingredients(now Corbion)	Keystone Laboratories Inc.	Stowers Institute for Medical Research
Cargill Inc.	Knit-Rite, Inc.	Synbiotics (now Zoetis)
CC Medical	Laboratory Corp. Of America	Teva Neuroscience Inc./IVX Animal Health
Center For Pharmaceutical Research	Lifeline Foods	TVAX Biomedical
Central Biomedica Inc.	Manna Pro Corporation	United BioSource
Cereal Ingredients Inc.	Mattson Jack Group (now Kantar Health)	Ventria Bioscience
Cerner Corporation	Mawd Pathology Group Inc.	Veterinary Specialty Products
Clinical Reference Laboratory (CRL)	Mediware Information Systems	Vince & Assoc. (now Altasciences)
Clinical Trials Technology (Now Phoenix Medical)	MFA Inc.	Vira COR/IBT/Progene
Cramer Products Inc.	MGP Ingredients Inc.	Vit-A-Zine Inc.
Crititech	MidAmerica Neuroscience Institute	West Agro Inc.
CSS Analytical Company Inc.	Mid-South Milling Co. Inc.	Xenometrics LLC
CIA Labs/Paradox	Midwest Research Institute	ZuPreem
Danisco Cultor USA (Now Dupont)	Missouri Cancer Associates	
Danisco USA (Now Dupont)	Nestle Purina Petcare Global	

<i>Companies Listed in 2009, Still Operating in the Region</i>		
AAI Pharma (Now KCAS)	Clipper Dist. (Phoenix Pharmaceutical)	Keystone Laboratories Inc.
Acceleration Laboratory Services, Inc.	Cramer Products Inc.	Knit-Rite Inc.
Addison Biological Laboratory	CritiTech, Inc.	KrolPharma Resources
Advanced Clustering Techs	CSS Analytical Co Inc.	Lab Corp
AgriLabs	CTT Research (Now Phoenix Medical)	Lifeline Foods LLC
Albaugh, Inc.	Danisco USA Inc. (Now Dupont)	Manna Pro Corp
Alburtylab, Inc.	Danisco USA Inc. (Now Dupont)	Mars Petcare
Allied Monitor, Inc.	Dechra Veterinary Products	Mawd Pathology Group Inc.
American Proteins, Inc.	Deciphera Pharmaceuticals LLC	Mediware Information Systems
Ameri-Pac (now Wilbur-Ellis Feed)	Del Monte Pet(now Big Heart Pet)	MFA Incorporated
ABC Labs (Now EAG Laboratories)	DeLaval Manufacturing (West Agro)	MGP Ingredients, Inc.
Antech Diagnostics	Disposable Instrument Co , Inc.	Mid-America Neuroscience Inst.
B F Ascher & Co, Inc.	Durrie Vision	Mid-South Milling Co, Inc.
Bayer Animal Health	Ecto Development Corp	Midwest Research Institute
Bayer CropScience	Equinosis LLC	Missouri Cancer Associates, Inc.
Becker Underwood (now BASF)	Forage Research	Nestle Purina Petcare Co
Beckloff Assoc. (Now Cardinal Health)	Great Plains Laboratory	Nexus Medical LLC
Biomed Valley Discoveries Inc	Hans Rudolph, Inc.	Nostrum Laboratories, Inc.
Biosyntropy Solutions (now SCD Probiotics)	Heart of America Eyecare, PA	Oceanic Medical Products, Inc.
BioZyme, Inc.	HEMCO Corp	Oncimmune LLC
Blue Endo	Hennessy Research Associates	Orbis Biosciences, Inc.
Boehringer Ingelheim Vetmedica, Inc.	Herschel J Gaddy & Associates	Ortho-Care, Inc.
Brown Medical Industries (now Brownmed)	Hill's Pet Nutrition, Inc.	Osteogenex, Inc.
C C Medical	Hunkeler Eye Institute	P B I Gordon Corp
Cancer Research Center	IdentiGEN North America	Pace Analytical
Caravan Ingredients (now Corbion)	ImmuPep, Inc.	Paternity Testing Corporation
Cargill Animal Nutrition	IMMVAC INC.	Petnet Solutions
Cargill, Inc.	Innovaprep, LLC	Phytotechnology Laboratories
Celgene Corporation	Inovatia Laboratories, LLC	Pinnacle Technology, Inc.
Centaur	Intervet, Inc. (now Merck)	PRA International
Center For Pharmaceutical Res	IodiTech, Inc.	Professional Toxicology Services
Central Biomedica, Inc.	Ivy Animal Health (now Elanco)	Propharma Group, Inc.
Cereal Ingredients, Inc.	J2 Scientific	Proteon Therapeutics, Inc.
Cerner Corp	Johnson County Clin-Trials	Pulse Needle-Free Systems (Felton Medical)
Ceva Biomune	KALO, Inc.	Purina Mills LLC
CIA Labs (Paradox)	Kansas City Allergy & Asthma	Quality Research Services
CII Laboratories, Inc.	Kantar Health	Quest Diagnostics
Clinical Reference Laboratory	KC BioMediX (now Innara)	Quintiles, Inc. (now IQVIA)

<i>Companies Listed in 2009, Still Operating in the Region</i>		
QVM Services LLC	Stone Manufacturing & Supply	Veritas Clinical Specialties
SAFC Biosciences, Inc.	Stowers Institute For Medical Research	Veterinary Specialty Products
Sceptor Industries (now Evogen)	Synbiotics (now Zoetis)	Vince & Associates Clinical Research
Shor-Line	Teva Neuroscience, Inc.	ViraCor-IBT Laboratories, Inc.
Sinclair Group, Inc.	Thermofisher Scientific (REMEL)	Vit A Zine, Inc.
Southwest Technologies, Inc.	TVAX Biomedical LLC	Xenometrics LLC
Sparhawk Laboratories, Inc.	United Biosource Corporation	ZuPreem
Steinlite Corp	Ventria Bioscience	

<i>Companies Listed in 2012, Still Operating in the Region</i>		
Acceleration LLC	Celgene Corp	Hill's Pet Nutrition, Inc.
Addison Biological Lab, Inc.	Centaur, Inc.	Hunkeler Eye Institute
Advanced Clustering Techs	Center For Pharmaceutical Res	IdentiGEN North America, Inc.
AgriLabs	Central Biomedica, Inc.	IMMVAC, Inc.
AKCIA, Inc.	Central Solutions, Inc.	Innovaprep, LLC
Albaugh	Cereal Ingredients, Inc.	Inovatia Laboratories
Alburtylab, Inc.	Cerner Corp	IodiTech, Inc.
Allied Monitor, Inc.	CEVA Biomune	Ivy Animal Health (now Elanco)
AIB International	CII Laboratories, Inc.	J2 Scientific
American Proteins, Inc.	Clinical Reference Lab, Inc.	Johnson County Clinical Trials
Ameri-Pac (now Wilbur-Ellis Feed)	Clinical Research Consultants	KALO, Inc.
Analab Clinical	Clipper Distributing Co	Kansas City Allergy & Asthma
ABC Labs (Now EAG Laboratories)	Cramer Products, Inc.	Kansas City Safety Alliance & Research
ANALYZEDIRECT.COM	Creche Innovations	Kantar Health
Antech Diagnostics	CritiTech, Inc.	KC BioMediX (now Innara)
Aratana Therapeutics, Inc.	CSS Analytical Co, Inc.	KCAS LLC
Argenta	CTT Research (Now Phoenix Medical)	Keystone Laboratories, Inc.
ASP Medical, LLC	Danisco USA (Dupont Nutrition)	Knit Rite, Inc.
B F Ascher Co., Inc.	Dechra Veterinary Products	Lifeline Foods LLC
Bayer Cropscience LP	Deciphera Pharmaceuticals	Likarda
Bayer Healthcare LLC	Del Monte Pet Products(now Big Heart Pet)	Manna Pro Corp
Becker Underwood (now BASF)	DeLaval Manufacturing (West Agro)	Mars Petcare
Bio-Interface Engineering	Disposable Instrument Co	MAWD Pathology Group, Inc.
Biomed Valley Discoveries, Inc.	Dupont/Danisco Nutrition & Health	Mediware Information Sysys, Inc.
BioMedical Devices of Kansas, LLC	Durrie Vision	Merck Animal Health
Biosyntropy Solutions (now SCD Probiotics)	Ecto Development Corp	MFA, Inc.
BioZyme, Inc.	Effexus Pharmaceutical LLC	MGP Ingredients, Inc.
Blue Endo	EMB Statistical Solutions	Mid-America Neuroscience Research Foundation
Boehringer Ingelheim Vetmedica, Inc.	EMCI	Mid-South Milling Co, Inc.
Brownmed, Inc.	Equinosis LLC	Missouri Cancer Associates LLC
C C Medical	Evogen, Inc.	MRI Global
Cancer Research Center	Exocytronics, LLC	MSBiotec (Megastarter, LLC)
Caravan Ingredients(now Corbion)	Flow Forward Medical	Nanopharm
Cardinal Health Specialty Solutions (Beckloff & Associates)	Great Plains Laboratory	Nanova Inc
Cardiovascular Imaging Technologies	Hans Rudolph Inc	Nestle Purina Pet Care
Cargill Animal Nutrition	Heart of America Eyecare, PA	Nexus Medical LLC
Cargill Inc	HEMCO Corp	Nika Biochemicals
Catalent Pharma Solutions	Hennessy Research Associates	Nostrum Laboratories Inc
ce2l	Herschel J Gaddy & Assoc	Oceanic Medical Products

<i>Companies Listed in 2012, Still Operating in the Region</i>		
Oncimmune USA LLC	Propharma Group, Inc.	Stowers Institute
Orbis Biosciences	Pulse Needle Free Systems, Inc.	Tensive Controls
Ortho-Care, Inc.	Purina Mills LLC	Teva Neuroscience, Inc.
OsteoGenex, Inc.	Quality Research Services	Thermo Fisher Scientific
Pace Analytical Svc, Inc.	Quest Diagnostics, Inc.	Triad Isotope Pharmacy
CIA Labs	Quintiles, Inc. (now IQVIA)	TVAX Biomedical LLC
Paternity TESTING Corp	QVM Services	United Biosource
PBI/Gordon Corp	RBC Medical Innovations	Ventria Bioscience
PETNET Solutions	SAFC Biosciences, Inc.	Veritas Clinical Specialities
Pfizer Animal Health (now Zoetis)	Shor-Line	Veterinary Specialty Products Inc
Phlogistix	Sinclair Group, Inc.	Vince & Assoc Clinical Rsrch
Physicians Reference Lab LLC	Sopharmia	Vira Cor-IBT Laboratories
Phytotechnology Laboratories	Southwest Technologies	Vit A Zine, Inc.
Pinnacle Technology, Inc.	Sparhawk Laboratories, Inc.	West Device Innovations LLC
Pivot International	Spinal Simplicity	Wound Care 360
Plastikon Health Care	Star Labs/Forage Research, Inc.	Xenometrics LLC
PRA International, Inc.	Steinlite Corp	Xenotech LLC
Professional Toxicology Svc	Stone Manufacturing & Supply	ZuPreem

Companies Listed in 2015, Still Operating in the Region		
Acceleration Laboratory Services, Inc.	Cardiovascular Imaging Technologies	ELIAS Animal Health, LLC
Adaptivepharma, LLC	Cardiovascular Outcomes	EMB Statistical Solutions
Addison Biological Laboratory, Inc.	Cargill Animal Nutrition	EMCI
Advanced Clustering Technologies, Inc.	Cargill, Inc.	ENDOVAC Animal Health
AgriLabs	Catalent Pharma Solutions	Equinosis LLC
AIB International	CC Medical (aka ArNeu)	Evogen, Inc.
AKCIA, Inc.	Celgene Corporation	Evoke Medical, LLC
Albaugh, LLC	Centaur Animal Health	Excite Pharma Services
Alburtylab, Inc.	Center For Pharmaceutical Rsch.	Exocytroics, LLC
Allied Monitor, Inc.	Central Biomedica, Inc.	FitBark, Inc.
Altasciences Clinical Research, Vince & Assoc.	Central Solutions, Inc.	Flow Forward Medical
Ameri-Pac (now Wilbur-Ellis Feed)	Cereal Ingredients, Inc.	Global Biologics LLC
AMPRO Products	Cerner Corporation	Great Plains Analytical Laboratory
Analab Clinical Research	Certtech, LLC	GTC Research
AnalyzeDirect	Ceva Animal Health	Hans Rudolph, Inc.
Ansera Analytics	CIA Labs	Health Outcomes Sciences
Antech Diagnostics, Inc.	Clinical Reference Laboratory, Inc.	Heart of America Eyecare, PA
Aratana Therapeutics	Clinical Research Consultants	Heartland Plant Innovaitons
ARE Labs, Inc.	Clinical Research of The Ozarks, Inc.	HEMCO Corp
Argenta Research LLC	Clipper Distributing Co	Hennessy Research Associates
ASP Medical, LLC	Conklin Company, Inc.	Herschel J Gaddy & Assoc
B.F. Ascher & Company, Inc.	Corbion	Hill's Pet Nutrition, Inc.
Bardavon Health Innovations	Cramer Products, Inc.	Hunkeler Eye Institute
BASF Corporation	Creche Innovations	Hyalogic LLC
Bayer Animal Health	Crititech, Inc.	HylaPharm
Bayer Cropscience LP	CryoCrate	Identigen North America, Inc.
Big Heart Pet Brands	CSS Analytical Co, Inc.	IDEXX BioAnalytics
Bio Med Valley Discoveries, Inc.	Dechra Veterinary Products	ImmuPep, Inc.
Bio-Interface Engineering	Deciphera Pharmaceuticals	ImpeDx Diagnostics
Biomedical Devices of Kansas LLC	DeLaval Manufacturing (West Agro)	Informed Health Solutions
BioNovus Innovations LLC	Disposable Instrument Company	Innara Health
BioPharmaPotentials	Dupont Industrial Biosciences	InnovaPrep LLC
Biozyme, Inc.	DuPont Nutrition & Health	Inovatia Laboratories, LLC
Blue Endo	Durrie Vision	IntelligeneCG
Boehringer Ingelheim Vetmedica, Inc.	EAG Laboratories	Ioditech, Inc.
Brownmed, Inc..	Ecto Development Corporation	Itamark Diagnostics LLC
Cancer Research Center	Effexus Pharmaceutical	J2 Scientific
Cardinal Health Regulatory Services	Ehrhardt Clinical Research LLC	Johnson County Clintrials, LLC
Cardioptimus LLC	Elanco Animal Health	KALO, Inc.

Companies Listed in 2015, Still Operating in the Region

KanPRO Research, Inc.	Nostrum Laboratories, Inc.	Schroer Manufacturing Company
Kansas City Allergy & Asthma	Novadiol, Inc.	Sekisui XenoTech, LLC
Kansas City Safety Alliance & Research	Oceanic Medical Products, Inc.	Silvergate Pharmaceuticals, Inc.
Kantar Health	Oncimmune USA LLC	Simcro
KC Bio, LLC	One Medicine Consulting	Sinclair Research Center
KCAS, LLC	Ortho-Care, Inc.	SJK Global, LLC
Keystone Laboratories, Inc.	Osteogenex, Inc.	Sopharmbique
Knit-Rite, Inc.	Pace Analytical Services, Inc.	Southwest Technologies Inc
KrolPharma Resources	Pathfinder Health Innovations, Inc.	Sparhawk Laboratories, Inc.
Lab Corp (was PRL)	PatientsVoices	Spinal Simplicity
Labconco Corporation	PBI/Gordon	Star Labs (Forage Research)
Lifeline Foods, LLC	PETNET Solutions, Inc.	Steinlite Corp
LifeScience Technologies, LLC	pHLOGISTIX, LLC	Stone Manufacturing & Supply Co., Inc.
Likarda	Phoenix Medical Research	Stowers Institute For Medical Research
Manna Pro Products, LLC	Phytotechnology Labs, LLC	SynTech Research
Mars Petcare	Pinnacle Technology, Inc.	TCI Peptide Therapeutics
Mawd Pathology Group, Inc.	Pivot International	Teva Pharmaceuticals
Mediware Information Systems, Inc.	Plastikon Healthcare, LLC	The Great Plains Laboratory
Merck Animal Health	PRA International	Thermo Fisher Scientific Inc.
Meta Bioscience LLC	Propharma Group Inc	Tiger Energy Solutions
Metactive Medical, Inc.	Proteon Therapeutics	Triad Isotopes, Inc.
MFA, Inc.	ProTox Services	Trinity Biotech
MGP Ingredients, Inc.	PTC Laboratories, Inc.	TVAX Biomedical, LLC
Microprotein Technologies, Inc.	Pulse Needle Free Systems, Inc.	UBC - An Express Scripts Company
Mid-South Milling Company, Inc.	Purina Mills LLC	Ventria Bioscience
Millipore Sigma	Quality Research Services	Veritas Clinical Specialities
Missouri Cancer Associates LLC	Quest Analytics, LLC	Veterinary and Biomedical Research Ctr.
MRIGlobal	Quest Diagnostics, Inc.	Veterinary Specialty Products, Inc.
MS Biotec	Quintiles, Inc. (now IQVIA)	ViraCor Eurofins
Nanova Inc	QVM Services, LLC	Vita A Zine Inc
NBO3 Technologies	RBC Medical Innovations	West Device Innovations LLC
Nestle Purina PTC	Rex Animal Health	Woundcare 360, LLC
Nexus Medical, LLC	Rockwell Laboratories, Ltd.	Xenometrics, LLC
Nika Biochemicals Inc	Rowe Neurology Institute	Zoetis, Inc.
Norbrook, Inc.	SCD Probiotics	ZuPreem

Kansas City Regional Life Sciences Industry Census 2018 Survey

SECTION ONE

Section one results will be published in a final report and released to area stakeholders, policy makers, and economic development professionals. The report will publish:

- Company name
- Location
- Branch or Headquarters
- Primary Focus and Expertise

1. Your name (required)

2. Your Title

3. Company name (required)

4. Company Address (optional)

5. County (required)

6. Phone number

7. Is this location: (required)

- a. Headquarters of your company
- b. A branch location
- c. A US headquarters of a multinational company

8. How many employees do you currently have in the region (Manhattan, KS to Columbia, MO)?

9. What is your company's primary area of expertise? (required)

- a. Drugs & Pharmaceuticals - *Developing and or manufacturing medicinal, botanical, and biological products for therapeutic or diagnostic applications.*
- b. Biotechnology Research and Testing - *Laboratories providing critical analysis and services, excluding exclusive consumer health labs, and/or firms performing Research and Development to advance new discoveries, treatments or services.*
- c. Healthcare & Life Science IT - *Developing software and technology to expand the capabilities of the bioscience industry*
- d. Medical Devices and Instruments – *Researching & Developing products with applications for animal or human health*
- e. Organic or Agricultural Chemicals - *companies whose research and/or development support plant science and agricultural sectors within the life sciences*
- f. Food Science/Feed or Plant-Based Products - *Food science companies research, develop and produce products integrating biological, chemical, and physical sciences. Plant-based product companies engage in research and development activities*

producing biofuels, composite materials, enhanced nutritional feeds/food, or synthetic meats.

g. Other: _____

10. Your company's **primary** focus is: (required)

- a. Human health
- b. Animal health or nutrition
- c. Plant Science

11. What are your secondary area(s) of expertise?

- a. Drugs & Pharmaceuticals
- b. Biotechnology Research and Testing
- c. Healthcare & Life Science IT
- d. Medical Devices and Instruments
- e. Organic or agricultural chemicals
- f. Food Science/Feed or Plant-Based Products
- g. Other: _____

SECTION TWO

All data compiled in Section two regarding sales, research spending and growth will be compiled only for analysis by Kansas City Area Life Science Institute. Published information will discuss this information in aggregate terms, such as "12 companies in the medical device market indicated that employee headcount rose in 2018." To see how this data was reported in 2015, you can download the report at <http://kclifesciences.org/reports/industry-census/>. Any questions or concerns regarding this survey may be directed to Donna Gordon at 816-304-7958.

The workforce questions will be used to inform curriculum/program development activities of regional education providers across the educational continuum – from preschool through college. Your input will provide important data to guide development of educational programs that will produce trained workforce for the life sciences industry. Information will be presented in aggregate only.

1. Comparing the number of employees in 2018 to the number of employees in 2017, would you say the number has:
 - a. Increased
 - b. Decreased
 - c. Stayed about the same

2. How many employees would you anticipate adding to your company in the next 36 months?
 - a. Plan to cut staff
 - b. Zero
 - c. One
 - d. 2-5
 - e. 6-25
 - f. 25-100
 - g. Over 100

3. What are your greatest workforce needs in the next 36 months? (check all that apply)
- a. Technician level staffing –high school diploma
 - b. Technician level staffing –some post high school training
 - c. Associate of Arts Degree
 - d. Bachelor’s degree level
 - e. Master’s Degree level
 - f. PhD level scientists
4. What is the average length of vacancy for entry level positions at your company?
- a. 30 days or less
 - b. 30-60 days
 - c. 60-90 days
 - d. 90-120 days
 - e. Over 120 days
5. In the past 36 months has your use of part–time or temporary workers:
- a. Increased
 - b. Decreased
 - c. Stayed the same
 - d. Not Applicable/do not utilize
6. Have you utilized services from the public workforce system in identifying candidates to fill workforce needs in the last 24 months?
- a. Not at all
 - b. Rarely
 - c. Occasionally
 - d. Frequently
 - e. I am not familiar with their services
7. Have you needed to recruit workers for entry level positions from outside the region due to the quality and/or quantity of the available workforce in the last 24 months?
- a. Not at all
 - b. Rarely
 - c. Occasionally
 - d. Frequently
8. Would you be willing to have a representative of your company serve in an advisory capacity to inform and influence regional life sciences workforce development efforts?
- a. Yes
 - b. No
- If ‘Yes’, please provide the name of the representative, and their email address:
-
9. Your current research expenditures for this year are expected to be in the range of:
- a. None
 - b. Less than \$100,000

- c. From \$100,000 to \$500,000
- d. From \$500,000 to \$1 million
- e. From \$1 to \$5 million
- f. From \$5 to \$20 million
- g. From \$20 to \$100 million
- h. Over \$100 million

10. Your research expenditures for 2019 are expected to be in the range of:

- a. None
- b. Less than \$100,000
- c. From \$100,000 to \$500,000
- d. From \$500,000 to \$1 million
- e. From \$1 to \$5 million
- f. From \$5 to \$20 million
- g. From \$20 to \$100 million
- h. Over \$100 million

11. Company sales for 2018 are expected to be in the range of:

- a. Pre-revenue
- b. Less than \$100,000
- c. From \$100,000 to \$500,000
- d. From \$500,000 to \$1 million
- e. From \$1 to \$5 million
- f. From \$5 to \$20 million
- g. From \$20 to \$100 million
- h. Over \$100 million

Thank you for your response to the Kansas City Area Life Science Institute's census of life sciences companies. Your participation will help us to better showcase the area's strengths, develop resources and alliances to further the industry, and attract talent to the region.



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