

The Life Science Industry in Georgia:

ECONOMIC TRENDS AND IMPACT



GEORGIA BIO™
The Life Sciences Partnership

MAY 2019

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1. INTRODUCTION

With rapid innovation and emerging growth at new technological intersections, the life sciences sector in Georgia is developing quickly and continuing to play an important role in the state's economy. Georgia Bio, whose mission is to advance the growth of Georgia's life sciences industry and foster strategic partnerships, seeks to understand how the life sciences industry has evolved statewide over the last 5 years and identify key trends in jobs, workforce, research, entrepreneurship, and innovation. By quantifying the economic contribution of life sciences in the state through private-sector, academic, and public-sector jobs and investment, Georgia Bio can better describe and communicate the importance of the sector in statewide economic development.

RTI International¹ is pleased to present this summary analysis on the state of the life sciences sector in Georgia to Georgia Bio which describes the sector's economic contributions; industry trends; and ongoing activities in research, discovery, and innovation. This report draws from a mix of original data collection, public data, and private data sources to provide the most up-to-

date data for the state of Georgia. This summary analysis relies most heavily on a unique database created specifically for this study to reflect the distinct traits of Georgia's life science sector. This summary analysis is accompanied by a [technical appendix](#) with more detailed data and analysis on the life sciences industry and workforce.

The report is structured as follows:

- Section 2 describes the approach for compiling the unique life science database and outlines the economic contribution of life sciences to the state economy, including private-sector, public-sector, and academic contributions.
- Section 3 follows trends over time in the life sciences sector in Georgia, benchmarked with national trends.
- Section 4 illustrates trends in research, discovery, innovation, and entrepreneurship.

Finally, we draw out the most relevant trends for the life sciences sector for Georgia Bio and its stakeholders to consider, which can be found in the conclusions in [Section 5](#).

¹ RTI is an independent, nonprofit research institute that provides research, development, and technical services to government and commercial clients worldwide. Our mission is to improve the human condition by turning knowledge into practice.

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2. ECONOMIC CONTRIBUTIONS OF LIFE SCIENCES IN GEORGIA

In this section, we provide a snapshot of the status of the life science sector and its contribution to the state economy of Georgia. The data builds from a custom-built list of companies, nonprofits, universities, and government agencies involved in life sciences in the state, drawing upon multiple public and private data sources. RTI tracked 1,960 firms across eight industry subsectors in life sciences, which contributed directly to over 63,800 jobs and \$10 billion in state GDP in 2017. This section details these findings.

2.1 Data Sources and Approach

Georgia Bio and RTI worked closely together to create a unique company database of the life sciences sector relying on a database of companies using seven data sources:

- BusinessWise data (as reported by Georgia Power)²
- Georgia Bio member list³
- Shaping Infinity report data⁴
- Technology Association of Georgia⁵
- Metro Atlanta Chamber bioscience datasets⁶
- Georgia Research Alliance bioscience data⁷
- Self-reported data from Georgia universities engaged in life sciences research: Augusta University, Emory University, Kennesaw State University, Georgia State University, University of Georgia⁸

These data sources allow for three unique subsectors important to Georgia that are not clearly captured by public data from sources such as the Bureau of Labor Statistics (BLS) — digital health companies, university life science

research, and the Centers for Disease Control and Prevention (CDC). Thus, the analysis can better describe the distinct and emerging nature of the life sciences sector in the state in the following subsectors:

- Biopharmaceuticals: Includes pharmaceutical, medicinal, and other biologic product and substance manufacturing.
- Medical devices: Includes optical and ophthalmic, dental equipment, and device, surgical device, laboratory equipment, and other medical apparatus manufacturing.
- Research, testing and medical laboratories: Includes testing laboratories, research, and development in life sciences, biotechnology, and nanotechnology, medical laboratories, imaging centers, and blood and organ banks.
- Agricultural feedstock and industrial biosciences: Includes fertilizer and chemical manufacturing, pesticide manufacturing, and agricultural products processing.
- Bioscience-related distribution: Includes wholesalers of medical equipment, druggists' goods, and farm supplies.
- Digital health: Includes a cross-cutting mix of companies in software publishing, computer systems design, computer products manufacturing, tele-health, data processing, and electronic medical records.
- Universities: Includes faculty, students, and staff they employed in life sciences research.
- Centers for Disease Control and Prevention (CDC): Includes full-time staff employed at the CDC in Atlanta.

² Bioscience Company Directory. BusinessWise, provided by Georgia Power. Data provided August 2018.

³ Georgia Bio Membership List. Data provided October 2018.

⁴ University of Georgia, University of Georgia Terry College of Business, Georgia Bio: Shaping Infinity: The Georgia Life Sciences Industry Analysis 2012. Accessed at https://www.gabio.org/assets/docs/Shaping_Infinity_2012.pdf

⁵ Technology Association of Georgia <https://www.tagonline.org/wheregeorgialeads/#health-it>

⁶ Bioscience Membership List. Metro Atlanta Chamber. Data provided August 2018.

⁷ Georgia Research Alliance Membership list. Data provided November 2018.

⁸ Correspondence with administrative staff in life science at each university. See Appendix D for full details.

Establishments in life sciences grew by over 32% between 2007 and 2017.

The final inventory includes 1,960 unique establishments⁹, subdivided into eight subsectors for deeper analysis. The largest number of establishments are in research, testing, and medical laboratories, while the highest number of life sciences jobs is in the emerging sector of digital health. Figure 1 provides summary statistics on each of the subsectors, with the number of establishments and total employment for each subsector to illustrate the composition of the life sciences sector.

RTI conducted an economic contributions analysis to shed light on how the life sciences sector generates multiplier effects across the state's economy. At each industry subsector, the model included a mix of industry trends and occupation types, to account for a) the upstream and downstream effects of company spending and supply chains (indirect effects) and b) the effect of local spending by employees on goods and services (induced effects). Together, those formed a input-output contribution model to determine the economic contributions of the life sciences sector in the supply chains for relevant goods and services and how households spend their labor income.¹⁰

2.2 Economic Contributions

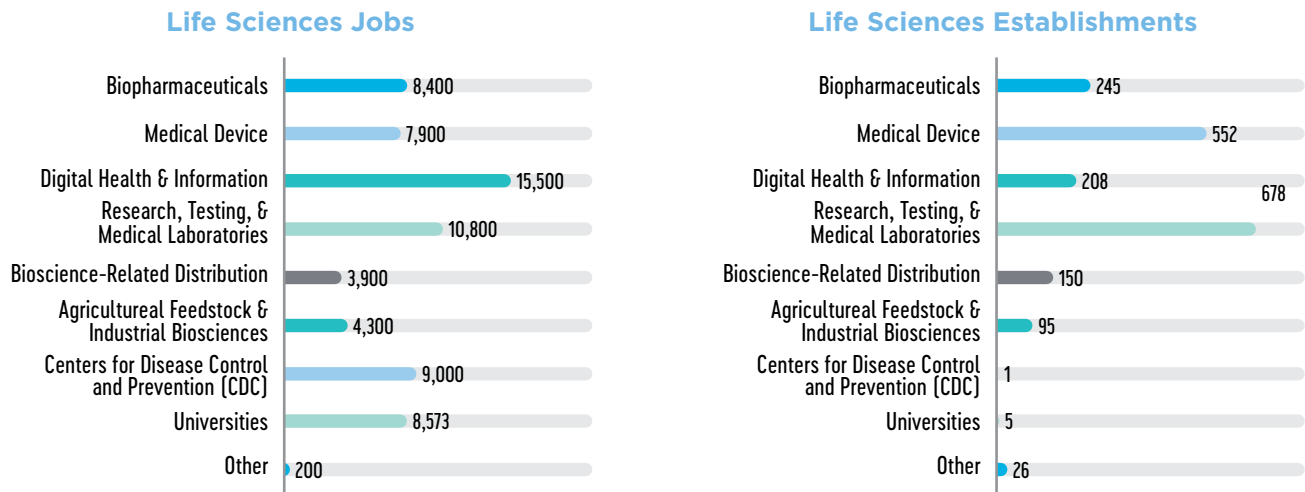
Drawing from the company database, RTI identified 1,960 establishments that employ 68,300 people across all subsectors and job types. Each of these establishments and jobs have a broader impact on the economic vitality of the state. They include jobs across a variety of subsectors, outlined in Figure 1, which include those with the most direct employment (15,500 jobs in digital health and informatics) ranging to smaller subsectors such as bioscience-related distribution and agricultural biosciences. Additionally, the highest number of individual establishments in the sector are in research, testing, and medical laboratories (678); medical device (552); and biopharmaceuticals (245). Public sector employment at the CDC, a critical and unique entity for the sector in Georgia, contributes approximately 9,000 direct full-time equivalent (FTE) jobs in the state, while 5 universities identified employ 8,573 directly through life sciences research and activities.

⁹ RTI identified 1,960 establishments in its economic contribution analysis of the life sciences sector to Georgia's economy. Some establishments were excluded because employment for some large companies with diverse business operations was unable to be attributed to life sciences.

¹⁰ We used IMPLAN Version 3.0 software for the input-output portion of the analysis.

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Figure 1. Establishments and Direct Employment in Life Sciences by Subsector



Source: Company Database. See Appendix D for a detailed description of each data source.

Building off this employment and establishing data, the economic contribution results show that in 2017 the 1,960 establishments we identified directly contributed 68,300 jobs and \$10 billion to Georgia's gross domestic product (GDP). These contributions represented 1.2% of all nonfarm employment in Georgia between October 2017 and October 2018 and 1.7% of Georgia's 2016 GDP.¹¹ This direct contribution is multiplied throughout the economy through the supply chains (indirect effects) and the income that workers in this sector spend (induced effects). Accounting for multiplier effects, the life sciences industry supports a total of approximately 194,000 jobs and contributes \$21.8 billion to Georgia's GDP. This represents 3.7% of Georgia's total nonfarm employment and 3.7% of Georgia's 2016 GDP.

The private, public, and academic sectors in Georgia contribute to the vitality of the life sciences sector as an economic driver. Based on RTI's economic contribution analysis,

- Private-sector firms in life sciences support approximately 153,000 jobs and contribute \$18.6 billion in state GDP.
- In the public sector, CDC supports a total of 27,800 jobs and contributes \$2.3 billion to state GDP.
- Spending on life sciences research at Georgia universities supports a total of 13,500 jobs and contributes \$950 million to state GDP. University life sciences-related research employs faculty, staff, and students primarily funded by grants for life sciences research from the National Institutes of Health (NIH) and other government institutions.

The 1,960 establishments we identified directly contributed 68,300 jobs and \$10 billion to Georgia's GDP in 2017.

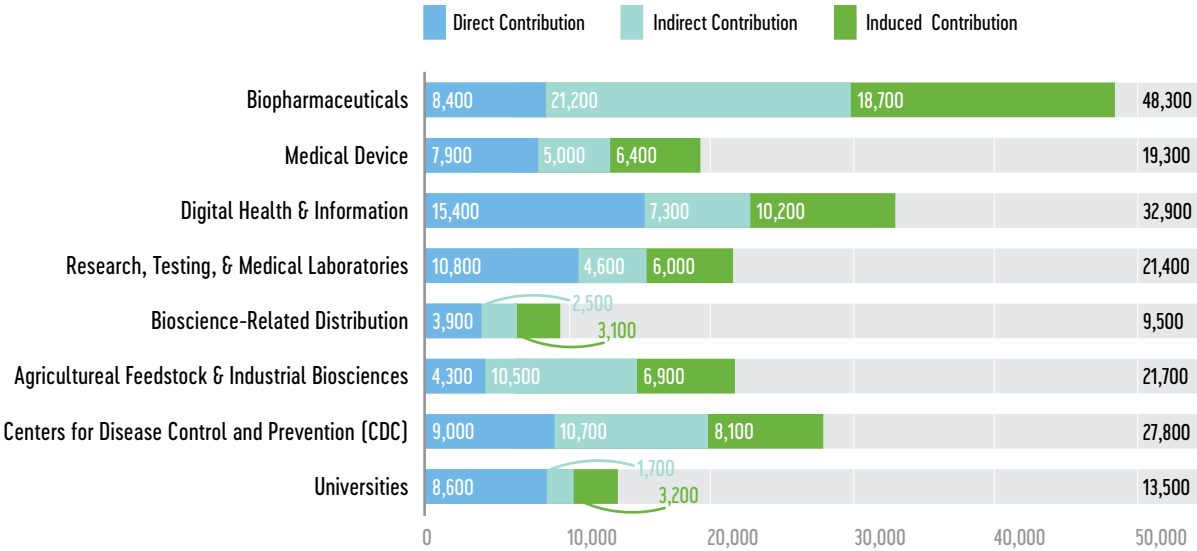
¹¹ Adjusted to 2018 dollars, Georgia's real GDP in 2016 was \$562.9 billion.

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The life sciences industry supports a total of approximately 194,000 jobs and contributes \$21.8 billion to Georgia's GDP. This represents 3.7% of Georgia's total nonfarm employment and 3.7% of Georgia's 2016 GDP.

As seen in Figure 2, biopharmaceutical establishments make up the largest total contribution to life sciences employment. Although it does not contribute the highest number of direct jobs (as seen with digital health), the biopharmaceuticals subsector has a strong multiplier effect, meaning that for each job, there is a ripple effect of 4.75 additional jobs throughout the state's economy. The relatively high cost of developing innovative drugs, the high-paying jobs in the sector, and the strong supply chain linkages of the sector across the state contribute to a strong multiplier effect.

Figure 2. Life Sciences Employment Contributions by Subsector in Georgia: 2017

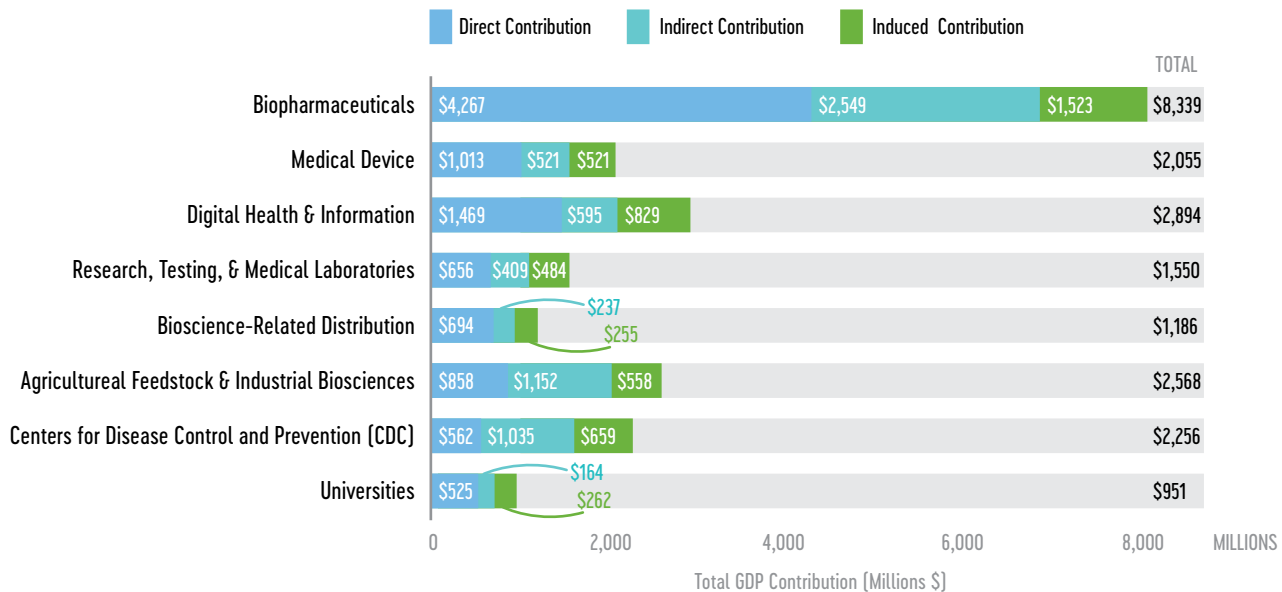


Direct contributions: People employed directly by life sciences companies. Indirect contributions: jobs in the upstream and downstream industries related to life sciences subsectors. Induced contributions: jobs that are a result of local spending by employees of life sciences companies.

Source: Company Database. See Appendix D for a detailed description of each data source.

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Figure 3. Life Sciences Gross Domestic Product (GDP) Contributions by Subsector in Georgia: 2017



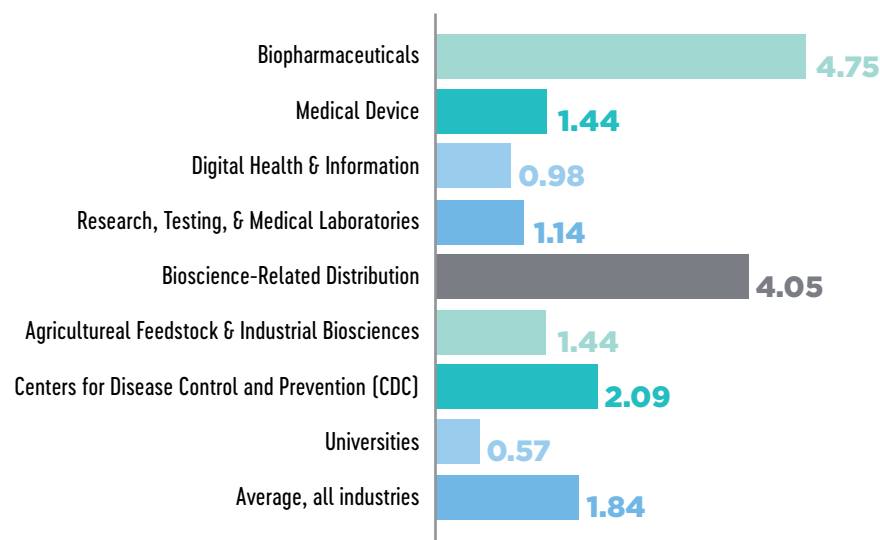
Source: Company Database. See Appendix D for a detailed description of each data source.

Direct contributions: Output generated directly by life sciences companies. Indirect contributions: output in the upstream and downstream industries related to life sciences subsectors. Induced contributions: output that results from local spending by employees of life sciences companies.

In addition to their multiplier effects on jobs, subsectors in life sciences have strong multiplier effects to the state's GDP. In total, life sciences contributed \$21.8 Billion, or 3.7 percent of Georgia's GDP in 2017. As seen in Figure 3, Biopharmaceuticals had the largest effect on GDP at over \$8.3 Billion, due to high paying jobs and ripple effects on jobs and economic output throughout the supply chain.

Private-sector firms in life sciences support approximately 153,000 jobs and contribute \$18.6 billion in state GDP.

Figure 4. Jobs Multipliers by Subsector in Life Sciences



Jobs Multiplier: Number of additional jobs supported by one job in a life sciences subsector

Source: Company Database. See Appendix D for a detailed description of each data source.

Jobs in life sciences have a multiplier effect statewide. In total, the 68,300 direct jobs in life sciences support an additional 125,700 jobs in the state through supply chains and local employee spending. This means that for every job created in life sciences in Georgia, an additional 1.84 jobs are supported in other sectors in the state. This multiplier varies across industries, with the highest being found in biopharmaceuticals, as seen in Figure 4.

The economic contributions of the life sciences industry provide a snapshot of the industry’s benefits to Georgia’s economy. Detailed tables and descriptions of the economic contributions of the life sciences sector are included in Appendix B.

Georgia’s 68,300 direct jobs in life sciences support an additional 125,700 jobs in the state through supply chains and local employee spending.

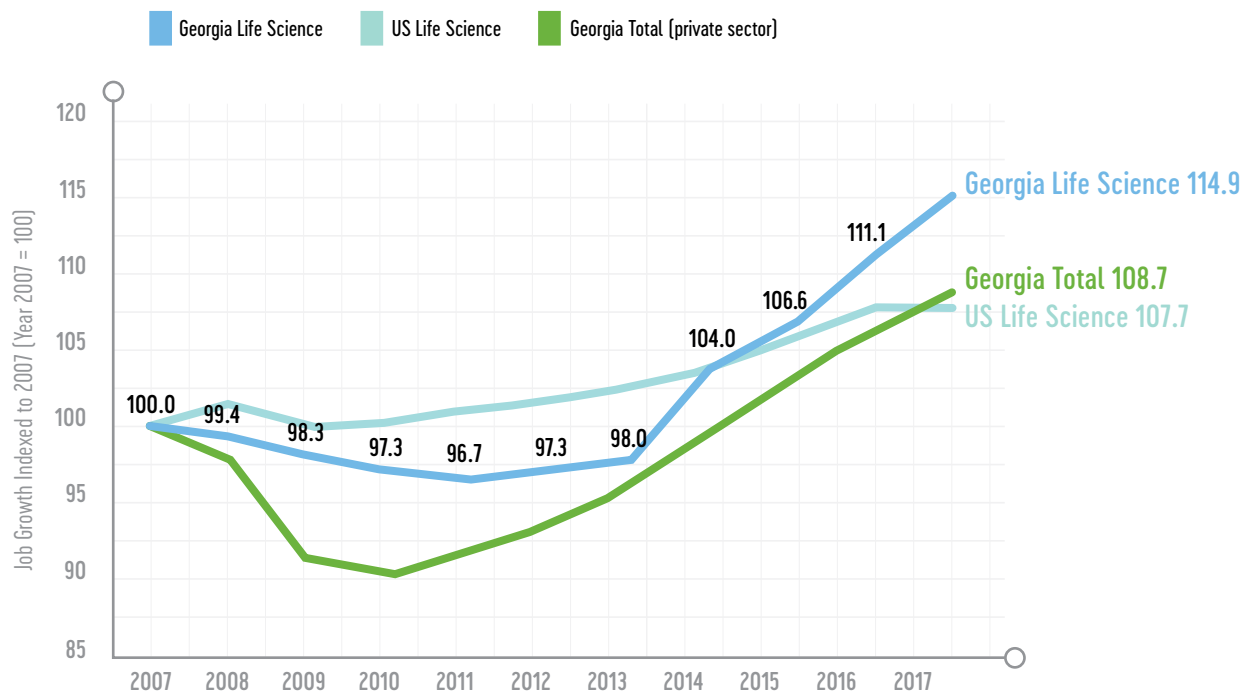
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3. LIFE SCIENCES SECTOR INDUSTRY TRENDS

The life sciences are a fast-growing and resilient industry in Georgia. From 2007 through 2017, employment in life sciences grew by 14.9% compared with 7.7% growth in life sciences nationally and 8.7% growth in private employment across all industries in the state. Additionally, as shown in Figure 5, the sector experienced

increases in new establishments and fewer job losses during the recession compared with a loss of nearly 10% of all private-sector jobs in Georgia from 2007 through 2010. These data demonstrate the life sciences sector's resiliency in the state as an emerging and stable sector for growth.

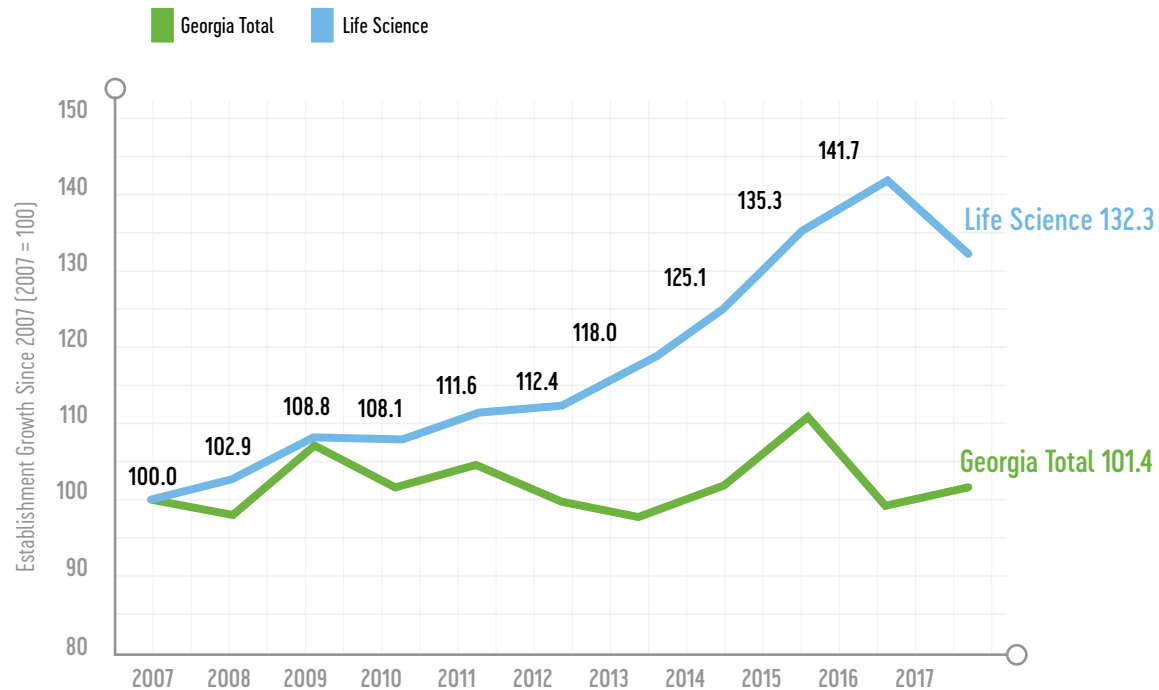
Figure 5. Job Growth in the Life Sciences Sector in Georgia: 2007–2017



Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW). Accessed November 2018 at <https://www.bls.gov/cew/>. Job growth is indexed to 2007=100.

The life sciences are a fast-growing and resilient industry in Georgia. From 2007 through 2017, employment in life sciences grew by 14.9% compared with 7.7% growth in life sciences nationally and 8.7% growth in private employment across all industries in the state.

Figure 6. Establishment Growth in the Life Sciences Sector in Georgia: 2007–2017



Source: U.S. Bureau of Labor Statistics, *Quarterly Census of Employment and Wages (QCEW)*. Accessed November 2018 at <https://www.bls.gov/cew/>. Job growth is indexed to 2007=100.

New business starts are contributing to the continued job growth in the life sciences sector: As shown in Figure 6, establishments in life sciences grew by over 32% between 2007 and 2017, compared with just 1% for all industries in the state. Private-sector establishments peaked in 2016 at and experienced a dip in 2017 because of a decline in the number of bioscience-related distribution and research and development firms.

Life sciences companies and jobs grew in Georgia across all subsectors at a rate faster than state and national averages, and that growth was driven by both growth of existing firms and a net gain of new firms. Section 4 describes the healthy ecosystem of research, discovery, and innovation that illustrates how growth is occurring through research funding, patenting, clinical trials, and venture capital.

4. RESEARCH, DISCOVERY, AND INNOVATION

Georgia has a healthy life sciences ecosystem for research, discovery, and innovation. Its research assets include world-class universities conducting life sciences research; ongoing clinical trials; and small, medium, and large firms engaging in cross-cutting innovation activity and patenting and startup activity. Understanding research, discovery, and innovation in the sector is important because it indicates the future trajectory of industry growth and competitive strengths in the state based on technological developments occurring today.

4.1 Research Funding

In 2018, institutions based in Georgia received \$549 million in National Institutes of Health (NIH) research funding. Over the last 5 years, Georgia has consistently ranked 15th nationally in average annual NIH funds received by states. The annual NIH funding to institutions in Georgia has grown by 20% since 2010, outpacing the national average of less than 8%. Universities in Georgia are the primary recipients of NIH research funding, receiving approximately 97% of NIH funds since 2010.¹²

NIH accounts for about half of all funding for life sciences research in Georgia. According to the 2017 National Science Foundation Higher Education Research and Development Survey, higher education institutions in Georgia received over \$1.15 billion in life sciences research

funding from federal, state, local, private, and other sources.¹³ Most research funding and expenditures occurred in biomedical and health science research with small percentages going to agricultural and natural resources research.

4.1.1 Small Business Research Funding

Included in the NIH funding totals is research funding that supports small businesses through the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR)¹⁴ grant program, which amounts to 3% of total NIH funding for life sciences research in the state. This funding is important because it signals the health of innovation-driven startups and scale-ups in the life sciences sector.

Since 2010, 88 companies in Georgia have received NIH SBIR/STTR grants for research in life sciences, averaging over \$14 million per year in funds received. They have executed a total of 322 projects. The top 10 recipients of SBIR/STTR funding in Georgia received approximately \$70 million between 2010 and 2018.

In 2018, the NIH SBIR/STTR program distributed \$21.9 million in funding in Georgia. Since 2010, the amount of SBIR/STTR life sciences research funding to organizations in Georgia has nearly doubled compared with growth of approximately 53% in the United States as a whole.

¹² National Institutes of Health. Research Portfolio Online Reporting Tools (RePORT). Accessed November 2018 at <https://report.nih.gov/award/index.cfm?ot=&fy=2017&state=GA&ic=&fm=&orgid=&distr=&rfa=&pid=#tab2>

¹³ National Science Foundation. Higher Education R&D Expenditures, by State. FY 2017. Accessed November 2018 at https://ncesdata.nsf.gov/herd/2017/html/herd2017_dst_70.html

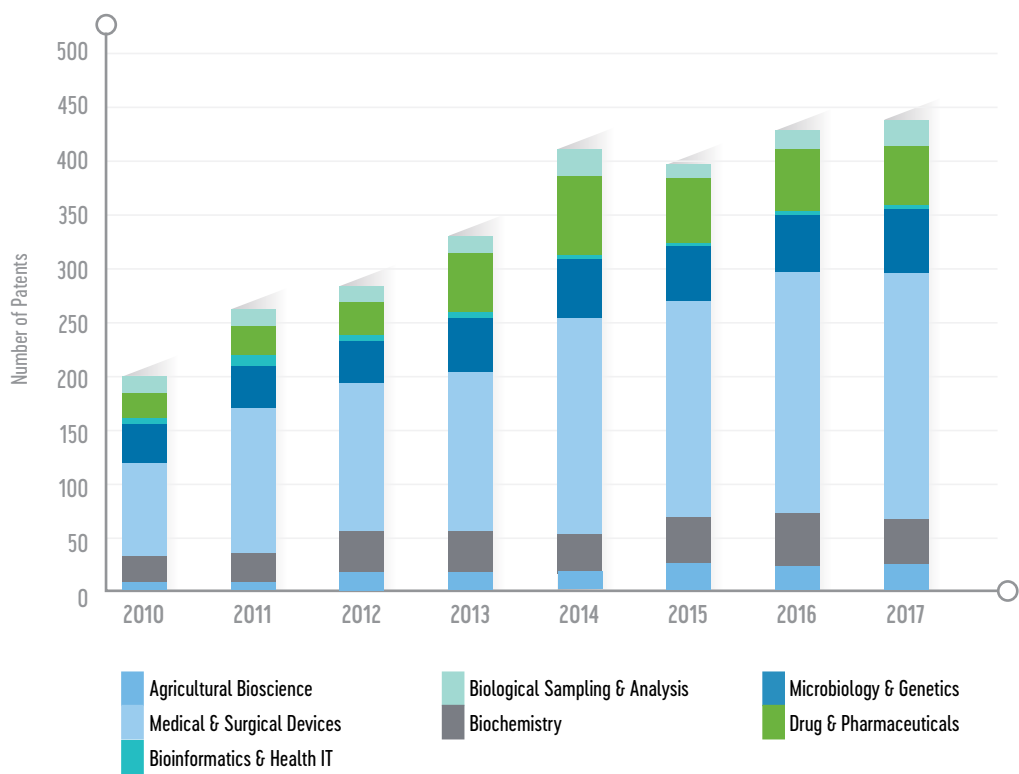
¹⁴ The SBIR and STTR programs, also known as America's Seed Fund, are one of the largest sources of early-stage capital for technology commercialization in the United States. These programs allow U.S.-owned and operated small businesses to engage in federal research and development that has a strong potential for commercialization. NIH's SBIR and STTR programs invest over \$1 billion annually in health and life sciences companies.

4.2 Patenting

Patents assigned to companies and institutions in Georgia offer insight into emerging trends in life sciences innovation. Following a multiyear investigation and application process, the U.S. Patent and Trademark Office (USPTO) grants intellectual property patents that allow for exclusive use of the technology and licensing rights to the assignee.

In 2017, the USPTO granted 437 patents to assignees based in Georgia in the categories of life sciences outlined in Figure 7. The number of life sciences patents granted in Georgia increased by 121% over 10 years from fewer than 200 in 2007. The primary driver of this growth was in medical and surgical devices, followed by drugs and pharmaceuticals.

Figure 7. Number of Patents Awarded by Category in Life Sciences in Georgia: 2010-2017



Source: U.S. Patent and Trademark Office PatentsView. Accessed December 2018 at <http://www.patentsview.org/web/#viz/comparisons&cmp=all/state/numDesc/2018>

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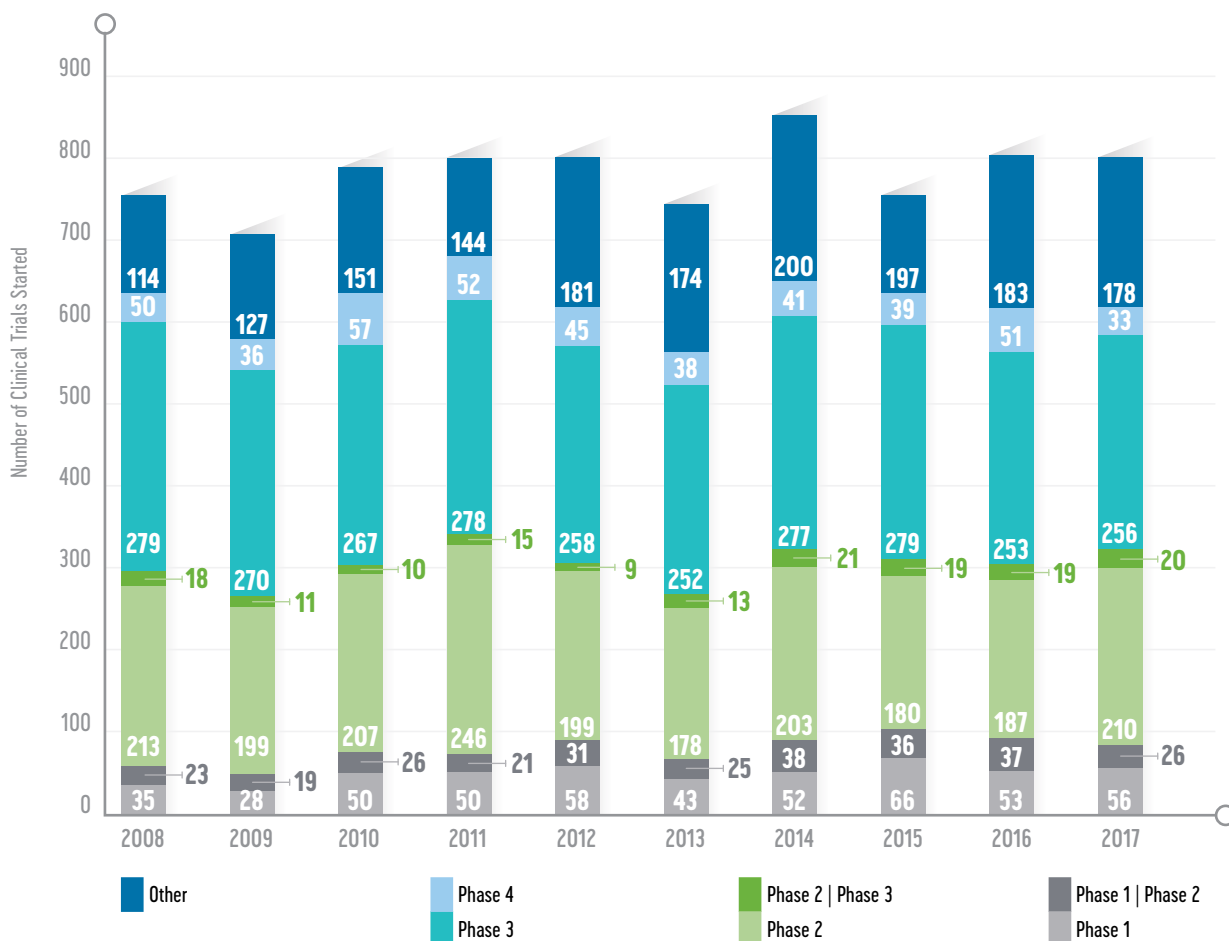
Patterns in frequent patent assignees offer a glimpse into where innovation is occurring in life sciences in Georgia. The most frequent patent assignees are largely representative of the research they perform: universities are the top patent generators in microbiology and biochemistry, and pharmaceutical companies generate the most patents in drugs and pharmaceuticals. There are also important intersections in and emerging trends in patenting activity. Georgia-based companies with notable patenting activity in life sciences include AT&T with innovations in biometric imaging and digital telehealth and NCR Corporation filing patents for improved biometrics in ATM and financial transaction security. Academic

institutions in Georgia are also among the top recipients of patents in life sciences, including the Georgia Institute of Technology, Emory University, Morehouse School of Medicine, and the University of Georgia.

4.3 Clinical Trials

Clinical trials led by Georgia-based institutions provide evidence of ongoing research in life sciences, particularly in the area of drug discovery. Between 2008 and 2018, an average of 760 clinical trials were started each year in Georgia. As seen in Figure 8, the majority of those were Phase 2 or Phase 3 trials. The totals have fluctuated since 2008 but are consistently between 700 and 800.

Figure 8. Number of Clinical Trials Started in Georgia: 2008–2017



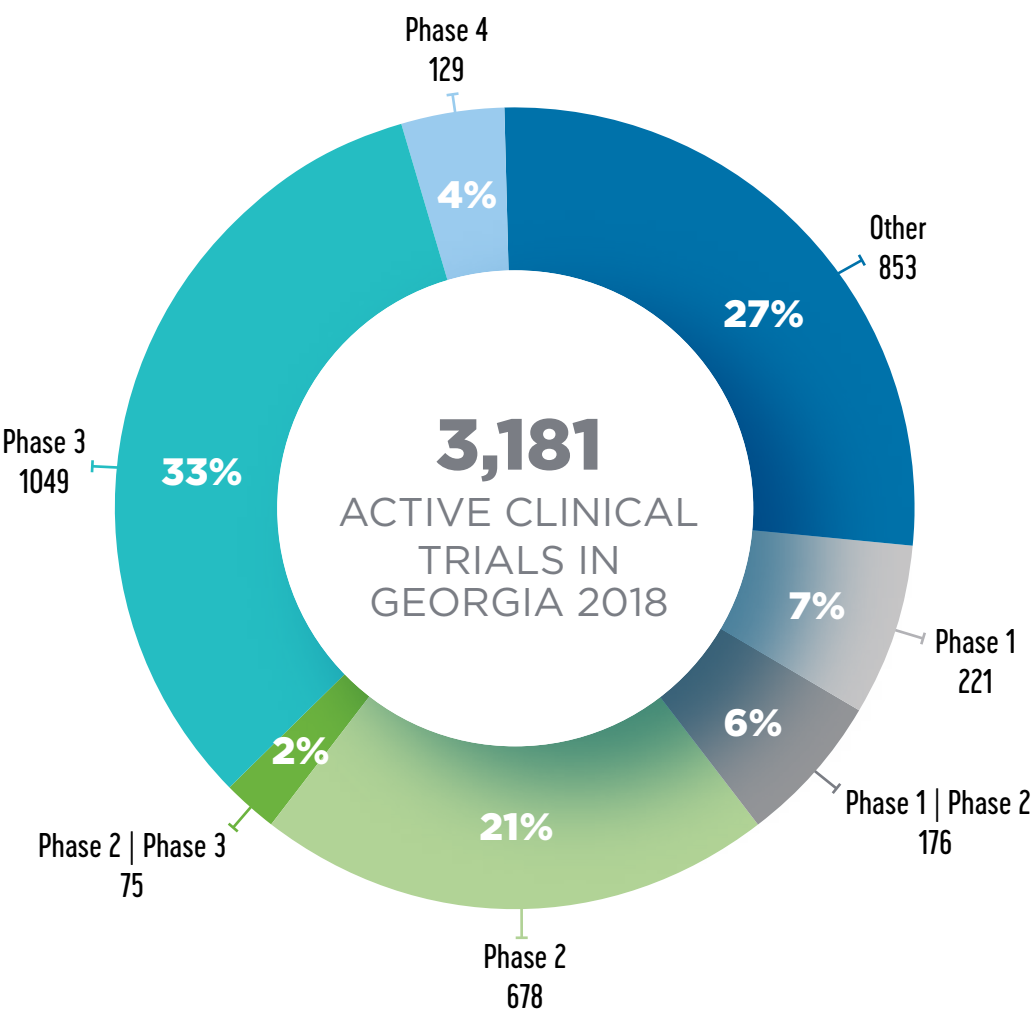
Source: National Institutes of Health, U.S. National Library of Medicine. Accessed 2018 at <https://clinicaltrials.gov/>

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Clinical trials are a multi-year process, and many of the trials started in 2017 and earlier were ongoing in 2018. Phase 3 clinical trials are a multi-year process to demonstrate widespread efficacy of a new pharmaceutical product, requiring high levels of time and investment once a product has passed through Phases 1 and 2. As seen in Figure 9, Georgia had 3,181 ongoing clinical trials in 2018; the largest portion (33%) was Phase 3 clinical trials.

Ongoing clinical trials in Georgia occur geographically in different places around the country and the world, but are led by the state’s leading universities, hospitals, and biopharmaceutical companies.

Figure 9. Number of Active Clinical Trials in Georgia: 2018



Source: National Institutes of Health. U.S. National Library of Medicine. Accessed 2018 at <https://clinicaltrials.gov/>

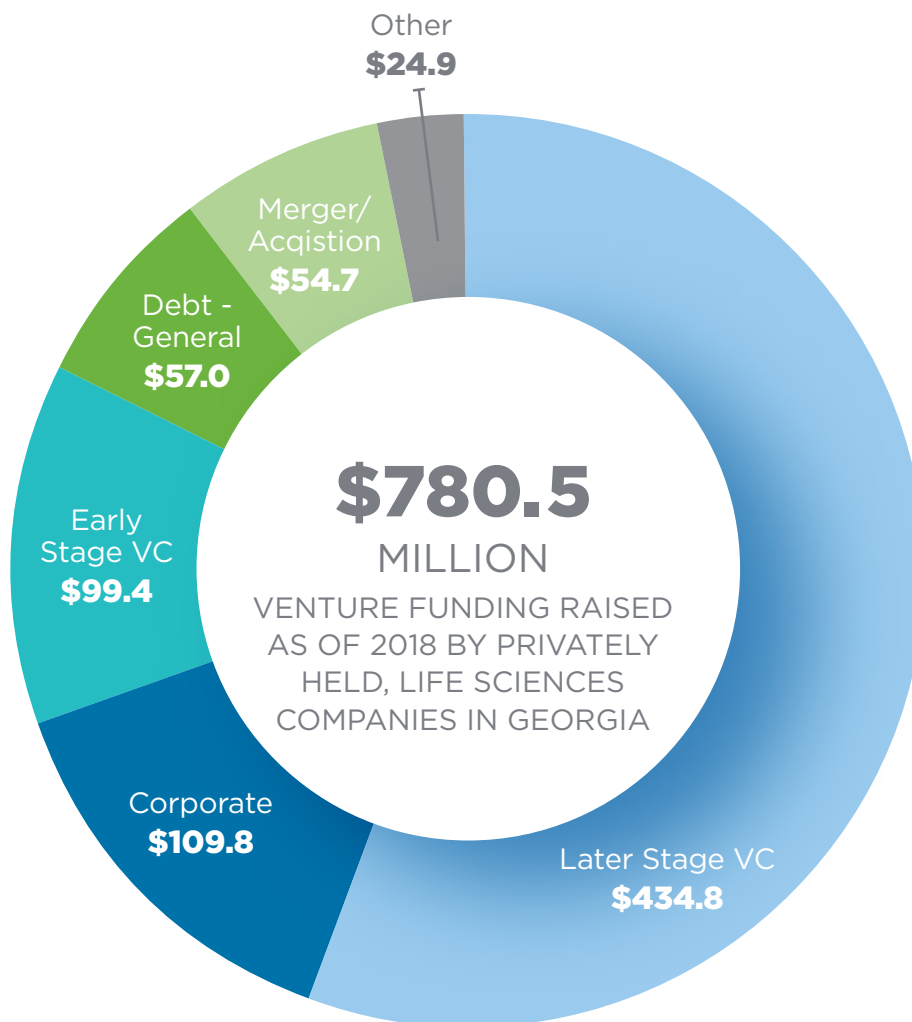
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4.4 Venture Capital

Together with research funding, patenting, and clinical trials, innovation in the life sciences startup sector contributes to the ecosystem of emerging technologies in Georgia. In 2018, 46 privately held, actively venture-backed companies were headquartered in Georgia in life sciences and had received one or more rounds of

funding; the most recent funding rounds occurred between 2012 and 2018. As seen in Figure 10, together those companies raised a cumulative \$780 million in venture funding, and the majority of the funding came from larger deals later stage rounds, by companies that had managed to raise early stage capital.

Figure 10. Status of Funding and Total Funds Raised by Life Sciences Companies in Georgia with Active Venture Capital Deals: 2018



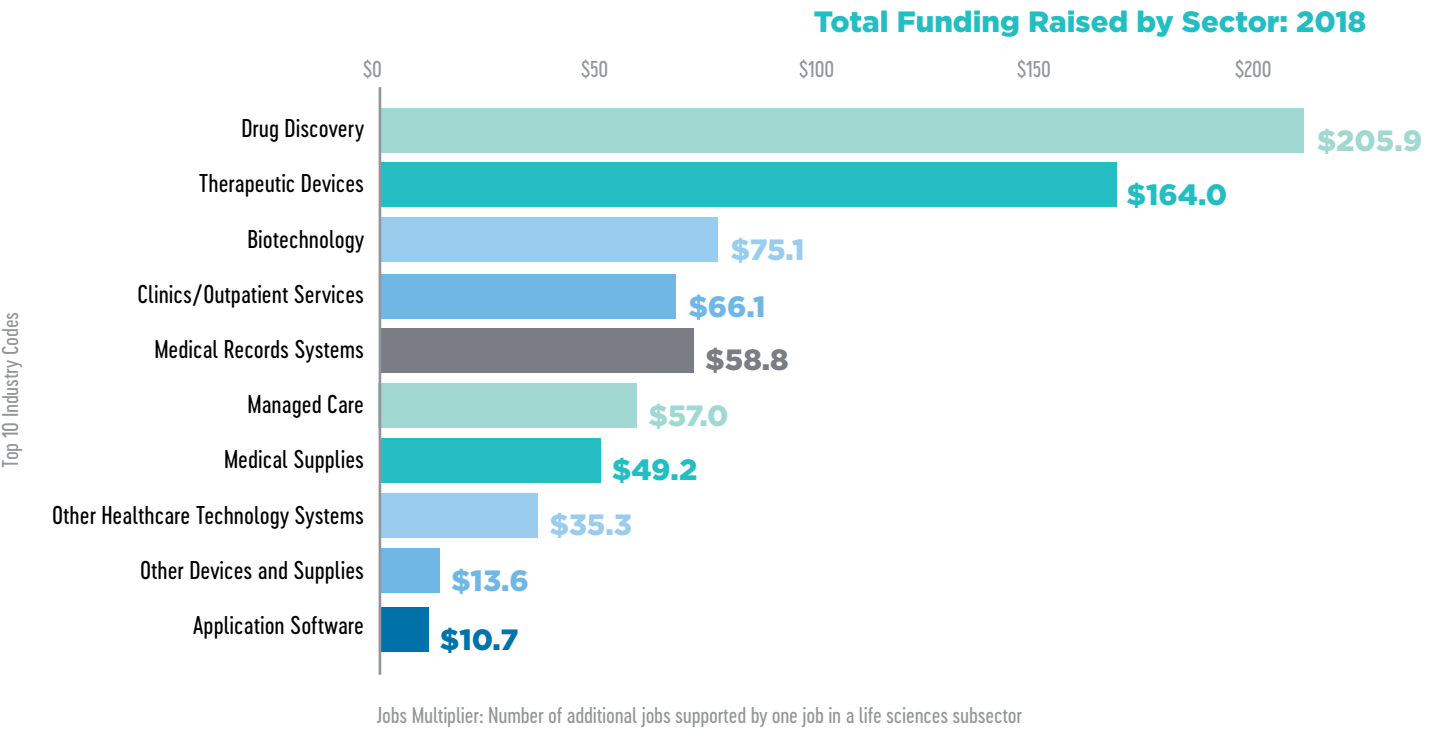
Source: Active Venture Capital Deals of Companies Headquartered in Georgia. Pitchbook. Data provided November 2018. Data represent all life sciences companies actively backed by outside funders in 2018 with most recent deals ranging from 2012 through 2018.

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The sectors with the largest amount of funding, as seen in Figure 11, raised include companies in drug discovery (\$205 million) and therapeutic devices (\$164 million). In total, active venture-backed firms

headquartered in Georgia employ over 9,000 people, with the largest total number of jobs in medical records systems.

Figure 11. Active Venture Capital Deals in Life Sciences in Georgia:



Source: Active Venture Capital Deals of Companies Headquartered in Georgia. Pitchbook. Data provided November 2018. Data represent all companies actively backed by venture capital funds in 2018.

In 2018, 46 privately held, actively venture-backed companies were headquartered in Georgia in life sciences and had received one or more rounds of funding.

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5. CONCLUSIONS



The life sciences sector in Georgia includes 1,960 establishments, which directly contributed 68,300 jobs and \$10 billion to Georgia's gross domestic product (GDP) in 2017. These contributions represented 1.2% of all nonfarm employment in Georgia between October 2017 and October 2018 and 1.7% of Georgia's 2016 GDP. These include jobs in the private sector, academic sector, and the government sector represented by Centers for Disease Control and Prevention (CDC) in Atlanta. Accounting for multiplier effects, the life sciences sector supports a total of approximately 194,000 jobs and contributes \$21.8 billion to Georgia's GDP. This represents 3.7% of Georgia's GDP and 3.7% of all nonfarm employment.

Life sciences research spending at Georgia universities supports a total of 13,500 jobs and contributes \$950 million to state GDP. University life sciences-related research employs faculty, staff, and students primarily funded by grants for life sciences research from the National Institutes of Health (NIH) and other government institutions. One job in life sciences has a multiplier effect of 1.84 additional jobs in the economy through indirect (supply chain and associated industries) and induced effects (local household spending). Those effects vary across industries.

- Biopharmaceuticals have the highest multiplier effect on jobs (4.75 indirect and induced jobs for every 1 job in biopharma) and the highest contribution to GDP in the state (over \$8 billion annually).
- The Centers for Disease Control and Prevention (CDC) has a multiplier effect of 3.0 on the state's GDP, meaning that for every dollar of GDP directly supported by CDC's economic activities in Georgia, \$3.00 are supported elsewhere in Georgia's economy.

Life sciences and IT are converging in the digital health sector in the state. Digital health contributes to the largest number of direct jobs (15,000) of the eight life sciences subsectors in the state. Despite the high number of jobs, there is a low output of patents and venture activity directly related to health IT.

The life sciences sector in Georgia is resilient and growing. From 2007 through 2017, private-sector life sciences jobs grew by nearly 15% compared with less than 9% for the state. New business establishments grew by over 32%, indicating a large percentage of job growth led by new businesses opening. Additionally, the sector did not see the large job losses seen in other sectors in the state during the recession between 2008 and 2011. Research funding to institutions and small businesses based in Georgia has increased steadily over the last 10 years and is growing at a rate faster than the national average. Approximately half of the total university research funding comes from NIH, and the remainder comes from a mix of federal, state, and private sources. Emory University is the top recipient of life sciences research funds, but the University of Georgia, Augusta University, Georgia State University, and Morehouse School of Medicine also receive substantial levels of life sciences research funding.

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In 2017, higher education institutions in Georgia received over \$1.15 billion in life sciences research funding from federal, state, local, private, and other sources. Most research funding and expenditures occurred in biomedical and health science research with small percentages going to agricultural and natural resources research.

One of the ways research funding is leveraged is for patentable inventions. Patents granted to researchers in Georgia have increased over the last 7 years and are showing evidence of new trends in the life sciences sector. Companies like AT&T and NCR are filing high numbers of patents for applications like biometric imaging, which illustrates the convergence of life sciences and digital technology and offers evidence of an emerging digital health sector in the state.

Clinical research is also crucial to the life sciences industry, helping researchers and companies understand how new technologies benefit patients in terms of efficacy and safety. Georgia has an active network of institutions leading clinical trials. Between 700 and 800 clinical trials consistently start each year in Georgia. The state had over 3,100 clinical trials active in 2018.

As new technologies mature and meet critical development milestones, investors, and venture capitalists provide funding to help companies with market potential scale. Venture-backed companies in life sciences with active deals in Georgia have raised over \$780 million in funding, primarily from later stage venture capital and corporate funds. Companies in drug discovery and therapeutic devices have raised the most venture funds. Together, venture-backed firms employ approximately 9,000 people in the state; the largest number of jobs is in the field of medical records systems.



SPONSOR PROFILES



BIO is the world's largest trade association representing the interests of the biotechnology community and membership includes university and academic institutes, investors in the life sciences, and state and regional economic development organizations in 45 states and Puerto Rico. Our members are at the cutting-edge of technological invention and are involved in the research and development of innovative health care, agricultural, industrial and environmental biotechnology products – including biodefense and pandemic preparedness. Overwhelmingly, biotechnology companies are small start-ups and early-stage companies. In the drug development sector alone, there are more than 1,500 innovative companies here in the United States, investing nearly \$80 Billion annually in U.S.-based biomedical research and development efforts. More at www.bio.org.



The Georgia Department of Economic Development (GDECD) plans, manages, and mobilizes state resources to attract new business investment to Georgia, drive the expansion of existing industry and small business, locate new markets for Georgia products, and inspire tourists to visit Georgia. More at georgia.org.



The Georgia Global Health Alliance is a 501(c)(3) non-profit organization committed to GGHA is the collaborative voice of the global health community in Georgia. It organizes and convenes members and stakeholders around key global health priorities to achieve its vision for a world in which collaboration leads to global health equity. Learn more at www.gghalliance.org.



Georgia Research Alliance

The Georgia Research Alliance (GRA) grows Georgia's economy by expanding university research capacity and seeding and shaping startup companies around inventions and discoveries. For over twenty-eight years, GRA has worked to strengthen the university research enterprise in Georgia by working in partnership with the University System of Georgia and the Georgia Department of Economic Development to create the companies and jobs of Georgia's future. Visit gra.org for more information.



At Johnson & Johnson, we believe good health is the foundation of vibrant lives, thriving communities and forward progress. That's why for more than 130 years, we have aimed to keep people well at every age and every stage of life. Today, as the world's largest and most broadly-based health care company, we are committed to using our reach and size for good. We strive to improve access and affordability, create healthier communities, and put a healthy mind, body and environment within reach of everyone, everywhere. We are blending our heart, science and ingenuity to profoundly change the trajectory of health for humanity. More at www.jnj.com.



The Pharmaceutical Research and Manufacturers of America (PhRMA) represents the country's leading innovative biopharmaceutical research companies, which are devoted to discovering and developing medicines that enable patients to live longer, healthier, and more productive lives. Since 2000, PhRMA member companies have invested more than \$600 billion in the search for new treatments and cures, including an estimated \$71.4 billion in 2017 alone. More at www.phrma.org.



At UCB, we come together everyday laser-focused on a simple question: How will this create value for people living with severe diseases? We are a global biopharmaceutical company committed to innovation to improve the lives of people with neurological, immunological, and bone diseases, finding solutions to meet their unique needs. More at ucb-usa.com.



As Avantor's channel brand, VWR serves as a leading global provider of product and service solutions to laboratory and production customers in the pharmaceutical, biotechnology, industrial, education, government and healthcare industries, and offers an integrated, seamless purchasing experience that is optimized for the way our customers do business. We set science in motion to create a better world. For more information, visit avantorsciences.com or vwr.com.



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And that changes everything.

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LaKeisha, living with epilepsy

Creating value **for patients**

At UCB, everything we do starts with a simple question:

"How will this create value for people living with severe diseases?"

We are committed to innovation to improve the lives of people with neurological, immunological, and bone disorders, finding solutions to meet their unique needs.

To learn more, visit
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