

Illinois Life Sciences Economic Blueprint



ABOUT iBIO

iBIO is a life sciences industry association representing the 85,000 life sciences jobs in Illinois. Our member companies, universities, service providers and venture capital firms conduct groundbreaking research and make investment to bring life-changing new treatments to patients around the world. As the main convener for the life sciences community in Illinois, iBIO advocates for the industry and promotes the industry's value and its benefits to the public and policymakers; connects innovators to investment, talent and collaboration; and engages industry members to foster the next generation of innovators and entrepreneurs to transform patient lives and the Illinois economy.

OUR MISSION AND VISION

iBIO promotes, connects and engages the life sciences community to drive discovery, transform patient lives and grow the Illinois economy.

Our vision is to make Chicago and Illinois one of the world's top life sciences industry centers.

ABOUT THE COMMUNITY

With more than **85,000 direct jobs**, Illinois is one of the top states for the life sciences industry. Illinois is also one of the most balanced states between industry subsectors and hosts the second largest concentration of biopharma companies in the country.



The life sciences industry is a huge contributor to the overall Illinois economy. In 2011, the overall economic output of the industry was **\$98.6 billion**. This figure represents \$52.4 billion of direct output, plus an additional \$46.2 billion in indirect and induced output.

WHAT IS THE LIFE SCIENCES INDUSTRY?

We define "Life Sciences Industry" to encompass companies in the fields of biotechnology, pharmaceuticals, biomedical technologies, medical devices and diagnostics, nutraceuticals, cosmeceuticals, food processing, environmental, biomedical devices, and organizations and institutions that devote the majority of their efforts in the various stages of research, development, technology transfer and commercialization.

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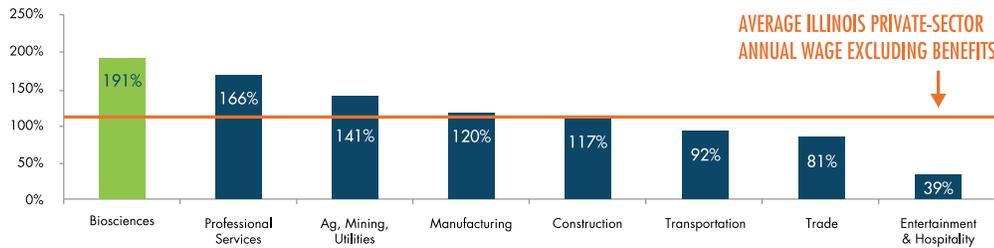


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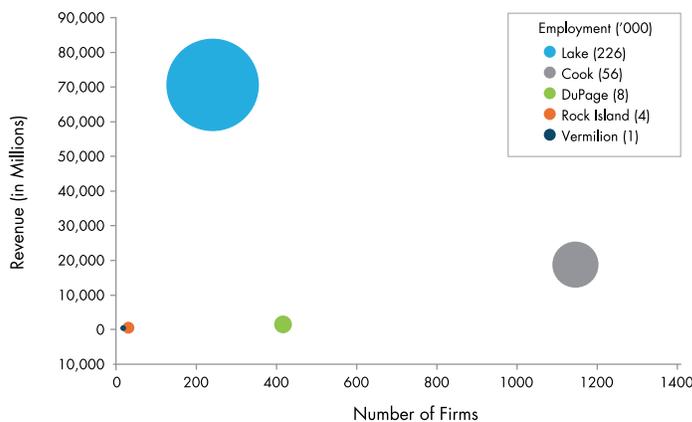
WAGES

Regarding wages, the life sciences industry is also one of the highest paying industries. Illinois residents employed by life sciences companies earn 91% more than the average Illinois resident. Illinois state and local taxes paid by the life sciences industry equal approximately 4.7% of all state and local taxes collected in Illinois.



GEOGRAPHY

The geographical distribution of the life sciences industry is also diverse, with companies located in counties throughout Illinois. Of the top five counties in Illinois, Lake County hosts the greatest number of biopharma companies, and Cook County is primarily distinguished by its high concentration of startup companies in the biopharma, device and food and nutrition fields. DuPage County, Rock Island County and Vermilion County round out the top five in Illinois with a significant presence of agricultural and industrial firms.



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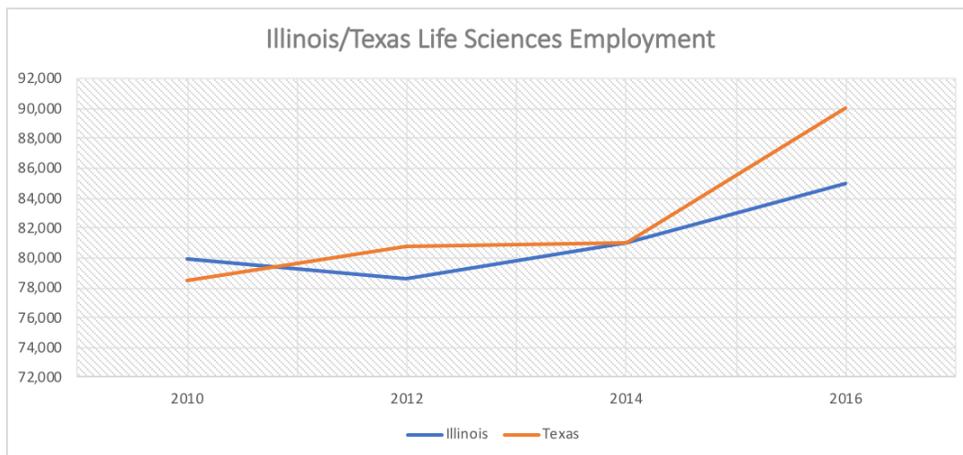
GROWTH

With more than 85,000 life sciences jobs, Illinois is among the top tier of states in terms of industry employment. As the chart below indicates, the Illinois life sciences industry grew by 3.8% since 2014, slightly behind the national average of 4.4% and well behind the growth of the other states with established communities.

State	Employment Growth (2014-2016)	Total Direct Employment 2016
Georgia	10.60%	32,000
Arizona	9%	25,686
Massachusetts	8.90%	94,000
Texas	8.60%	89,746
California	7%	268,000
Illinois	3.80%	85,210

The Value of Bioscience Innovation in Growing Jobs and Improving Quality of Life 2018

Historically the size of the Illinois and Texas life sciences industries have been virtually the same. The graph below highlights the difference in recent growth rates between the states since 2010.



There are a few reasons why Illinois is falling behind the other leading life science industry states, and why Illinois is in effect exporting research and development (R&D), talent and jobs.



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ACCESS TO CAPITAL

Illinois life sciences companies have received \$1.6 billion in venture capital investments from 2014 through 2017. But the state still receives a fraction of the funding available in California and Massachusetts.

Total Bioscience Venture Capital Investment, 2014-17		Bioscience Venture Capital Distributions	
Leading States	Total (\$ Millions)	Leading States	\$ Per 1M Population
California	\$28,582	Massachusetts	\$2,226
Massachusetts	\$15,270	California	\$723
New York	\$2,168	Washington	\$269
Washington	\$1,993	Connecticut	\$250
Pennsylvania	\$1,778	Colorado	\$210
Texas	\$1,591	Minnesota	\$203
Illinois	\$1,586	Utah	\$200
North Carolina	\$1,368	District of Columbia	\$159
Colorado	\$1,180	Maryland	\$158
Minnesota	\$1,132	Pennsylvania	\$139

Source: TEconomy Partners analysis of data from PitchBook Data, Inc.

The need for funding continues to be a reality confronting all life science industry companies. Locating funds to underwrite innovative research is an on-going challenge for small companies which require significant funding to hire qualified personnel and acquire research facilities and equipment. More established companies require larger infusions of venture capital funding for investments in additional infrastructure and clinical research and to move products into the marketplace.

According to a 2016 study by Tufts Center for the study of Drug Development, it can take anywhere from 10-15 years and more than \$2 billion dollars to successfully bring a biotech product to market.

Other states have passed measures and have implemented policies to encourage venture capital and discovery fund investments that benefit targeted technology sectors. These initiatives tend to specifically target early stage funding typically underserved by existing capital markets. Policymakers in other states are establishing a variety of mechanisms to provide vital "deal flow" funding for companies at various stages of research and development, including the encouragement of pension fund and quasi-public investments administered by privately managed venture funds, to tax credits to angel investors.

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INFRASTRUCTURE

Illinois' life sciences industry is growing rapidly, and it takes a complex web of resources to ensure that new companies can form and succeed while remaining in Illinois. According to the Illinois Science and Technology Coalition's Illinois Innovation Index, 942 startups came out of Illinois universities in the past

For emerging life sciences startups in Illinois, the availability of quality laboratory space is one of the most crucial components for continued life sciences industry growth, innovation and development, and yet it is Illinois' scarcest resource.

Startup companies needing less than 1,000 square-feet and growth-stage companies in need of 5,000 square-feet or more of lab space simply have nowhere to go in Illinois. According to CBRE of the 12.5 million square feet of commercial lab space, there is just 1.2 percent available for new companies or expansion.

These facilities are not physical labs, but these facilities create the ecosystem of public private partnerships. More specifically, it is space for universities to team with big and small companies to innovate and commercialize new ventures.

Larger life sciences companies looking to expand or relocate facilities to Illinois do not have an option to move into pre-existing space, they must build-to-suit. This circumstance results in creating a more expensive option for these companies than other communities where we are seeing accelerated life sciences industry growth.

TALENT

The life sciences industry needs a strong supply of qualified, trained workers. Illinois is home to a tremendous talent pool and with more than 14 Research universities, Illinois is one of the best educated states in the United States.

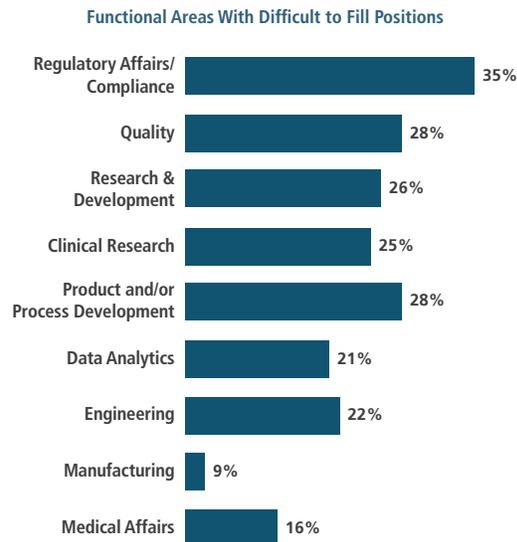
In addition to having world-class researchers, successful life sciences communities need to have an adequate supply of experienced management, sales, marketing, and regulatory in the life sciences industry. Recent announcements of employee reductions and company relocations have diminished the experienced talent pool needed to grow the community and attract relocations.

In 2017 Illinois companies participated in a nationwide life sciences workforce trends survey and report. When surveyed about how difficult it has been to hire certain positions, 78% of respondents reported that they were able to fill positions within 4 months; 42% of them within 9 weeks or less.

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Based on the survey the graph below identifies functional areas that are difficult for life sciences companies to fill. Regulatory Affairs/ Compliance positions continue to stand out as the most challenging to fill. 35% of respondents described those positions as “more difficult” or “much more difficult” than average to fill.



Multiple companies cited significant individual challenges in finding the right candidates for C-suite positions or for positions in Analytical R&D, Bioinformatics, Clinical Development, Clinical Operations, IT & Data Analytics, Project/Program Management, Quality, Regulatory, Research, Sales, Software Engineering.

While Illinois universities are excellent sources for entry-level positions, companies of all sizes are increasingly utilizing recruiters and staffing firms to place candidates into job openings for experienced employees.



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POLICY BLUEPRINT FOR GROWTH

For members of the Illinois life sciences industry now is a critical time to get actively involved in planning for the future of the industry. The Life Sciences industry in Illinois directly employs over 85,000 workers. It is the highest paying industry in Illinois and provides the state with \$98.5B in economic output.

To support the growth of the life sciences industry in Illinois iBIO has developed three overarching goals:

1. Strengthening our ecosystem;
2. Life sciences workforce development and talent retention; and
3. Open Illinois to relocations and expansion

STRENGTHENING OUR ECOSYSTEM

Life Sciences companies are fueled by their R&D, and a robust startup community is critical to a success-ful life sciences ecosystem. Because of the lengthy commercialization timeline for the life sciences industry, there are three distinct phases of company creation and expansion. The chart below highlights the different stages of life sciences companies and the related policy best practices from other states necessary to support that stage of company.

<p>Emerging / startup companies: Typically, these companies have no products on the market and have fewer than 100 employees. Funding is often provided by Angel and Venture Capital sources. Funding provides the company with the ability to begin to verify the viability of a new compound, device or diagnostic tool.</p>	<p>State Best Practices:</p> <ul style="list-style-type: none"> - SBIR/STTR Small Business Technology Match Funding - Seed Capital Tax Credit - Incubator/Accelerator Funding
<p>Testing Companies: This group of companies is made up of mid-stage product development and later stage regulatory review and approval. These companies require significant investment in personnel, equipment and facilities. Mid-stage companies typically have fewer than 200 employees and their products are usually in Phase I FDA trials. The later stage companies must show that their products are both safe and effective. Often pilot-scale manufacturing must be built or contract manufacturing capacity must be secured along with the require personnel.</p>	<p>State Best Practices:</p> <ul style="list-style-type: none"> - Net Operation Losses (Carry-Over, Transferability) (Massachusetts has a 15 year NOL) - Innovation Investment Tax Incentives (Massachusetts has a 10% refundable life sciences investment tax credit in addition to the states R&D tax credit as well as a refundable FDA User Fee Credit.)
<p>Manufacturing Companies: Larger companies with product on the market. These companies are manufacturing commercial quantities of product and have a sales force or license product to another company. Traditional sources of financing are commercial loans and public stock offerings.</p>	<p>State Best Practices:</p> <ul style="list-style-type: none"> - Site and Infrastructure Grant Funds - Renewable Energy Tax Credits - Sales and Use Tax Discounts - Utility rebates

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WORKFORCE DEVELOPMENT

For the life sciences industry, which stands as the most research and development intensive sector of our economy, the importance of talent is well recognized—and the challenges are particularly acute. Industry, State Government and academia need to work in collaboration to identify skill training and education needs to support the growth of the community.

Ensuring a strong foundation of Science, Technology, Engineering and Mathematics (STEM) skills to prepare for postsecondary education and the lifelong learning required for careers in life sciences occupations.

Fostering postsecondary talent generation that promotes strong connections to career opportunities in life sciences.

Upgrading the skills of the incumbent workforce to meet the changing skill demands of the fast-paced innovations and changing business models transforming the life sciences industry.

Raising Illinois' ability to attract and to retain top health and life sciences talent across the highly competitive national labor markets for scientific, engineering, and medical talent.

MARKETING ILLINOIS FOR RELOCATIONS AND EXPANSIONS

Illinois historically has been successful in attracting the establishment of life sciences headquarters and relocations for foreign and domestic companies. Transportation infrastructure, quality of life and geographic location have been constant benefits to attract companies but increasingly Illinois has lost out on some possible relocations because the state is not viewed as business friendly. The policy recommendations provided in the first goal section: Strengthening our Ecosystem will provide some basic economic incentives. In addition to incentives, state government and the industry should collaborate on marketing the industry.

Raise Illinois profile by attracting life sciences international trade conventions like the Annual International BIO Convention

Leverage domestic and foreign conventions to market and showcase the Illinois life sciences industry

Deputize corporate leadership as brand ambassadors for the Illinois life sciences industry

Target marketing efforts at overpriced and overcrowded markets.

iBIO believes a strong and consistent commitment by our government partners is critical to maintaining an ecosystem for industry growth in Illinois. **When government, industry, and academia work together, our community thrives.**