



## EXECUTIVE SUMMARY

# Massachusetts Life Sciences Employment Outlook 2024

Prepared by TEconomy Partners, LLC for Massachusetts Biotechnology Education Foundation

June 2024

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*For over 20 years MassBioEd has strengthened and diversified the life sciences workforce.*

*We offer a continuum of programs that support primary, secondary, and post-secondary students and educators, career-seeking adults, and life sciences professionals to enter, persist, and thrive in the industry.*

*We build bridges connecting industry, academia, and the public sector.*

The Massachusetts Biotechnology Education Foundation (MassBioEd) is committed to understanding and supporting the needs of the state's life sciences workforce. The annual Massachusetts Life Sciences Employment Outlook analyzes employment data and hiring demand to forecast job trends and skills required, impacting the state's education and training institutions in supplying critical talent.



## Emerging Workforce

Engaging educators,  
inspiring students grades 6-12

Teacher Training and  
Mentoring

Curriculum Development

Career Exploration

Comprehensive District  
Partnerships



## Imminent Workforce

Illuminating careers for  
college students and adults

Career Resources

College to Career

Career Hub

Apprenticeships



## Incumbent Workforce

Building skills of the current workforce

Incumbent Worker Training

Life Sciences Workforce  
Conference

Labor Trends Report

# Key Findings: Talent Demand Dynamics

**Massachusetts continues to grow its life sciences industry, with each of the state's major segments outpacing its national counterparts. While employment trends point to slowing growth relative to levels seen both during and immediately following the pandemic, the projected 10-year growth remains strong.**

- State life sciences employment increased by 11.6% from 2021 to 2023, continuing to outpace national growth of 6.3% over the same period. With more than 140,000 total life sciences jobs, the state continues to serve as a leading global life sciences hub employing a highly-skilled, highly specialized scientific and technical workforce.
- Recent job growth has slowed, however, increasing just 2.5% in 2023 after exceptionally strong growth from 2020 to 2022 that averaged 7.8% annually. Massachusetts biopharmaceuticals companies have been conducting a series of ongoing layoffs in 2023 that have led to a “cooling” job market, with further layoffs occurring in Q1 of 2024.<sup>1,2</sup>
- After increasing by nearly 46% from 2021 to 2022, job postings activity by the Massachusetts life sciences industry decreased by 33% from 2022 to 2023, a key signal of softening labor demand. This aligns with a broader trend of slowing job growth across biopharmaceuticals that has continued into 2024 nationwide, with 57 layoff announcements in the first quarter as companies cite declining revenues and difficult business environments.<sup>3</sup>
- Looking forward, Massachusetts is still projected to grow life sciences jobs by 32% or nearly 38,000 net new jobs by 2033.

1. Boston Globe, *'Like playing the lottery': Laid-off life sciences workers give a snapshot of a cooling-down sector*, October 10, 2023.  
2. Drug Discovery and Development, *Layoff tracker: Mapping the 11,350-plus biotech and pharma layoffs in early 2024*, April 25, 2024.  
3. Fierce Biotech, *No reprieve for biopharma layoffs in Q1: Fierce Biotech analysis*, April 1, 2024.

# Key Findings: Shifting Occupational, Skill Demands

**Occupational workforce trends reveal continued, though slowing, growth in some segments and shifting areas of emphasis relative to the past several years in key life sciences roles—a call to action for the state’s industry to retain its top talent and meet emerging industry needs for new skills.**

- After several years of strong growth, key occupational segments of the biopharmaceuticals and medical labs workforce highlighted in previous annual outlooks exhibited slower growth from 2022 to 2023, namely:
  - Scientific occupations grew at an average annual rate of nearly 7% from 2020 to 2022, but only grew by 2.7% from 2022 to 2023.
  - Computing and IT occupations grew at an average annual rate of 17.5% from 2020 to 2022, but only grew by 4.7% from 2022 to 2023.
  - Production occupations grew at an average annual rate of 16.6% from 2020 to 2022, but only grew by 1.7% from 2022 to 2023.
  - Scientific technician occupations grew at an average annual rate of 4.5% from 2020 to 2022, but only grew by 2.9% from 2022 to 2023.
- Meanwhile, several engineering occupations saw significant growth within the life sciences sector from 2021-23, with mechanical engineering employment increasing by 47% and industrial engineering jobs increasing by 43%. Statisticians represent a specialized and emerging occupational segment within the life sciences with a growth rate of 31% from 2021 to 2023, likely reflecting the increasing role of bioinformatics in supporting life sciences business operations.
- Skills with rising importance in life sciences job postings were focused on production facilities management, regulatory affairs, quality control/quality assurance, and information privacy.

# Key Findings: Talent Supply Dynamics

**Demand for life sciences talent produced by the state's world-class educational institutions continues to exceed the available supply. Growing the talent pipeline must remain a priority for the state.**

- Massachusetts' educational institutions remain 1.4 times more concentrated in life sciences degree production compared to the U.S., producing an average of 7,600 life sciences degree graduates annually from 2021 through 2023.
- Despite this pipeline and relatively strong in-state retention, demographic data suggest that the biopharmaceuticals and medical labs industry that anchors the state's life sciences sector captures just 1 in 5 life sciences and chemistry degree graduates, with 80% choosing other occupations.
- Projections indicate a lower level of annual job openings in key life sciences occupations over the next decade—life scientists, biotechnicians, and medical lab technicians—however, the state's educational institutions produce just 61% of the projected annual need in new graduates with degrees most closely aligned with these openings.
- The state's women and racial and ethnic minority life sciences degree graduate levels have remained relatively flat over the last several years, representing an area for ongoing investment to help industries build a more diverse workforce.
- In spite of the outsized levels of life sciences graduate output by the state's institutions, the ongoing supply-demand misalignment further emphasizes the importance of complementary alternative credentialing and new "on-ramps" for life sciences careers.

**Massachusetts' life sciences industry continues to compete with other states and other local industries for talent, reinforcing the need to remain consistent in retaining skilled talent and supporting ongoing life sciences workforce development despite concerns about industry contraction.**

- Recent industry trends highlight the ongoing competition with tech and other R&D-intensive industries for skilled workers, while demographic data shows evidence of significant "outflows" of life sciences degree holders to other traded sector industries in Massachusetts.
- Demographic data suggests that the share of life sciences degree holders working in the biopharmaceuticals and medical labs industry sees significant attrition in Massachusetts as workers age.

# Recommendations: Building the Talent Pipeline

## Higher Education

Continue to invest in programs serving life sciences talent pipeline—despite signs of a leaner growth environment—to meet the consistent need for replacement workers and to position the state for future growth.

Although early signals point to some contraction in 2024, it is still critical for higher education institutions to keep expanding life sciences educational programs to close the projected supply-demand gap of just over 2,200 graduates per year in key life sciences occupations. The state should seek to maintain its focus on growing this critical workforce segment despite an uncertain industry climate to ensure Massachusetts can meet consistent demand for replacement workers and is well-positioned for the industry's next growth cycle as a signature talent and innovation ecosystem.

## Higher Education & Government

Embed exposure to emerging life sciences technology concepts in educational programs to enhance career awareness and to ensure a future-ready workforce for the state.

Exposure to emerging technologies that are expected to rapidly transform the industry in coming years is critical. Education systems and government stakeholders can embed these topics into STEM programs and highlight relevancy to the life sciences industries in areas such as:

- Machine learning and generative AI and its role in drug discovery and bioinformatics
- Cell and gene therapies, which rely on the convergence of a portfolio of synthetic biology and multi-omics technologies
- Continuous bioprocessing, which is expected to incorporate a variety of advanced manufacturing technologies to enable new production methods.

## Industry, Higher Education, & Government

Continue to invest in K-12 STEM education initiatives designed to engage under-represented students in hands-on learning, to excite students about careers in STEM professions, and to connect them to local colleges and employers to pursue their career interests.

K-12 students represent the future of life sciences innovation but are often unaware of how exciting careers in science- and tech-driven industries can be. Hands-on programs that bring careers to life in the classroom, company tours in real-world laboratories, and with university and industry mentors and connections, are proven to enhance the likelihood of pursuing a degree or career in a STEM field. Massachusetts has been a leader in funding internships and career connections, but academic and industry under-representation persist. It is critical to invest in a diverse future STEM workforce.

# Recommendations: Growing & Retaining the Workforce

## Higher Education & Workforce Programs

Expand multidisciplinary skills-building programs for current students and the incumbent workforce in life sciences to meet emerging industry demand.

Approaches can use certifications, micro-credentialing, industry-recognized credentials (IRCs), or other skills-based and experiential programs to supplement existing life sciences curriculum or industry experience. Evidence from rising skills in Massachusetts job postings suggests that industry demand is rapidly expanding in applied skills areas such as:

- Industrial production management systems and technologies
- Quality control and quality assurance
- Regulatory affairs and compliance
- Clinical data management and data privacy.

## Industry & Workforce Programs

Develop programs and incentives to better retain experienced, mid-career life sciences workers to ensure their experiential knowledge does not leave the workforce.

Mid-career professionals bring valuable experience, skills, and mentorship to the life sciences industry, helping to ensure diffusion of experiential knowledge and ensuring continuity within companies. However, demographic data suggests a high rate of attrition for life sciences degree holders as they age, with biotech layoffs driving the potential for further exits. Industry and workforce development agencies can invest in programs to retain these critical workers through programs targeting opportunities for skills development, work-life balance, and worker assistance services in navigating job transitions that result from industry churn.



# Recommendations: Expanding Career Opportunities & Diversity

## Industry, Higher Education & Workforce Programs

**Work to identify opportunities where there are potential “on-ramps” for underutilized STEM workforce segments to increase access to a broader scientific talent supply.**

To help expand the talent pipeline and provide more access to the life sciences industry, particularly for STEM workers, companies can work with education and workforce development programs to identify alternative entry-level requirements, hybrid experiential learning on-ramps, and other apprenticeship-style models to provide career pathways to associates and bachelor’s-level life sciences graduates. Encouraging more students to begin careers in life sciences at pre-graduate school levels can offer access to a broader talent supply, while continuing education and nontraditional growth paths can help upskill talent to take on higher level job functions.

## Industry, Workforce Programs, & Government

**Accelerate efforts to invest in life sciences skills training programs at public institutions and in underserved communities to advance diversity, equity, and inclusion in the life sciences.**

Shares of women and minority life sciences degree graduates have either remained flat or decreased slightly in Massachusetts since 2022, indicating the need to re-prioritize development of a diverse workforce. A number of studies demonstrate the “business case” for investing in workplace DEI initiatives, while state and national competitiveness of the life sciences industry relies on expanding opportunity for a wider range of potential workers. Public-private initiatives that emphasize awareness and training for underserved populations across the education to workplace continuum are needed to ensure that the state does not lose ground in broadening its talent base.

## Industry & Higher Education

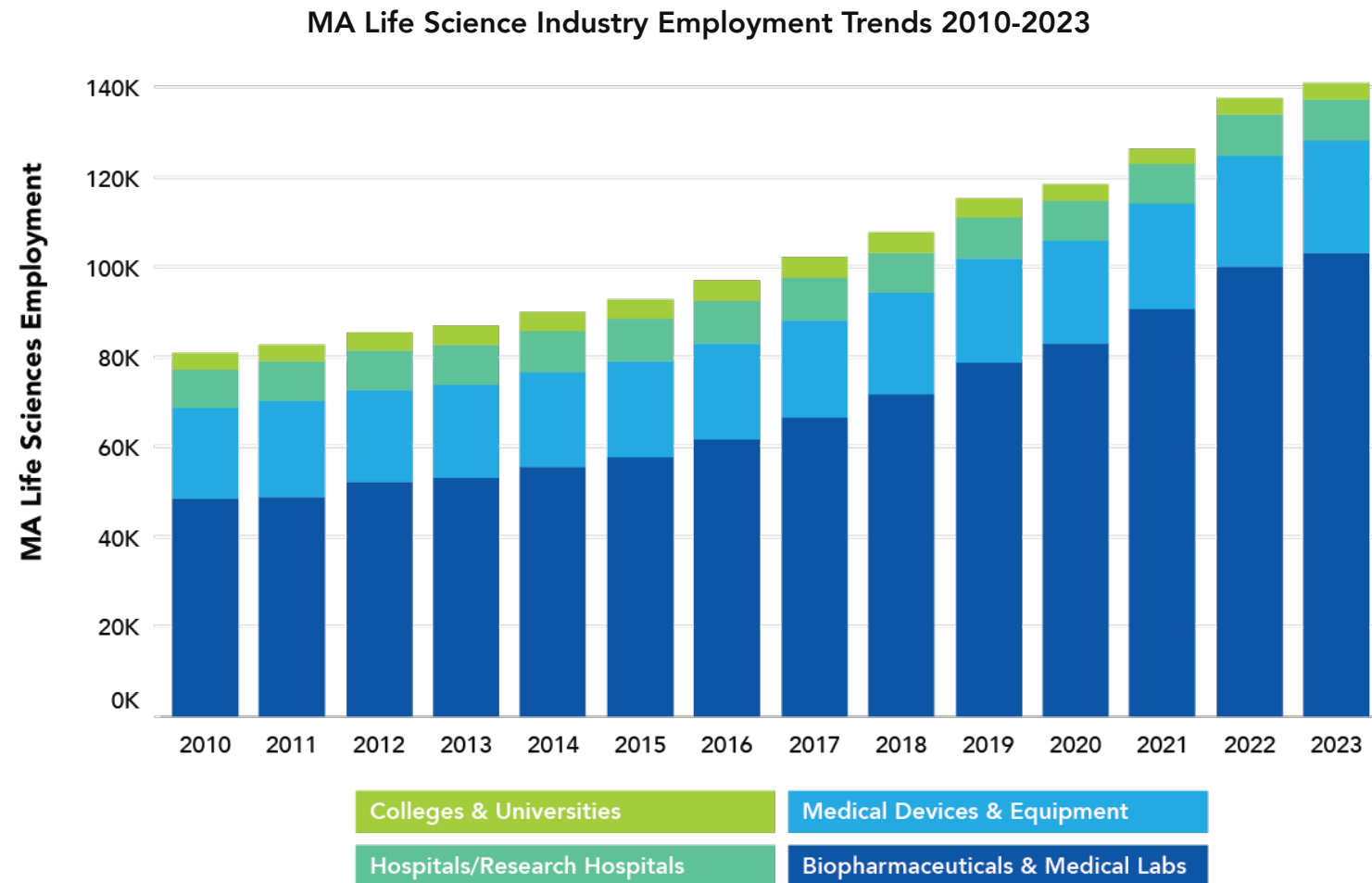
**Commit to assessing DEI efforts across academia and industry and further investing in initiatives that are making progress to reduce barriers to career entry and advancement for underrepresented groups.**

Underrepresentation in the life sciences industry persists for women and most racial and ethnic minority populations, a long-standing situation for both Massachusetts and nationally. MassBio recently found significant underrepresentation continues among people of color in the state’s overall biopharmaceutical industry workforce, in its executive leadership, and among its corporate board members. TEconomy’s recent research with PhRMA finds biopharmaceutical companies are investing significantly to advance DEI using holistic approaches—but industry alone cannot solve this challenge, and further coordination and collaboration is needed across ecosystem partners.



# Steady Life Sciences Growth for MA Over the Past Decade

- In 2023, there were 140,952 life sciences jobs in the state, growing by 2.5% since 2022
- The life sciences industry had grown at an average annual rate of nearly 7.8% from 2020 to 2022
- Over 73% of life sciences jobs in 2023 were in biopharmaceuticals and medical labs



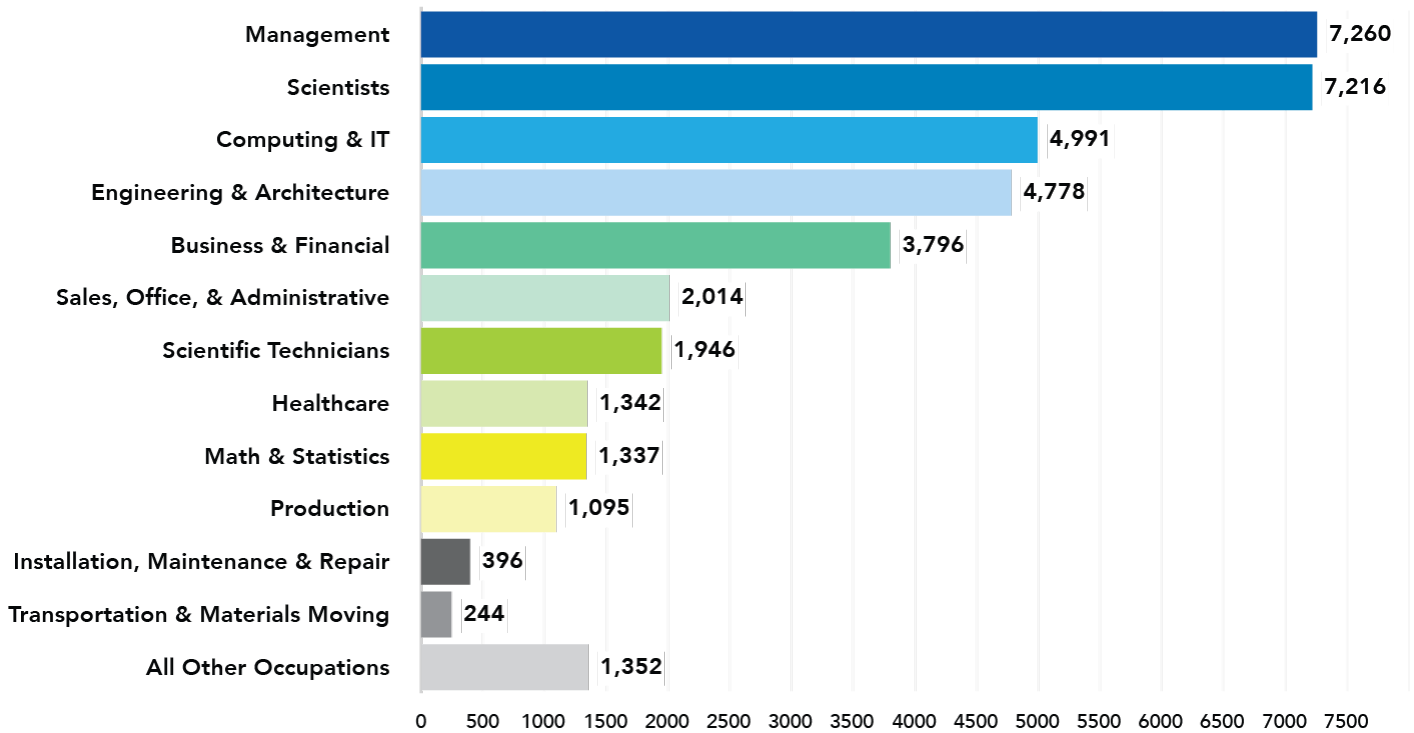
# Projected Growth Trends Reaffirm the Long-Term Importance of High Skills STEM Workers to the Life Sciences Industry’s Future in the State

Projected job growth in leading life sciences occupational segments over the next decade:

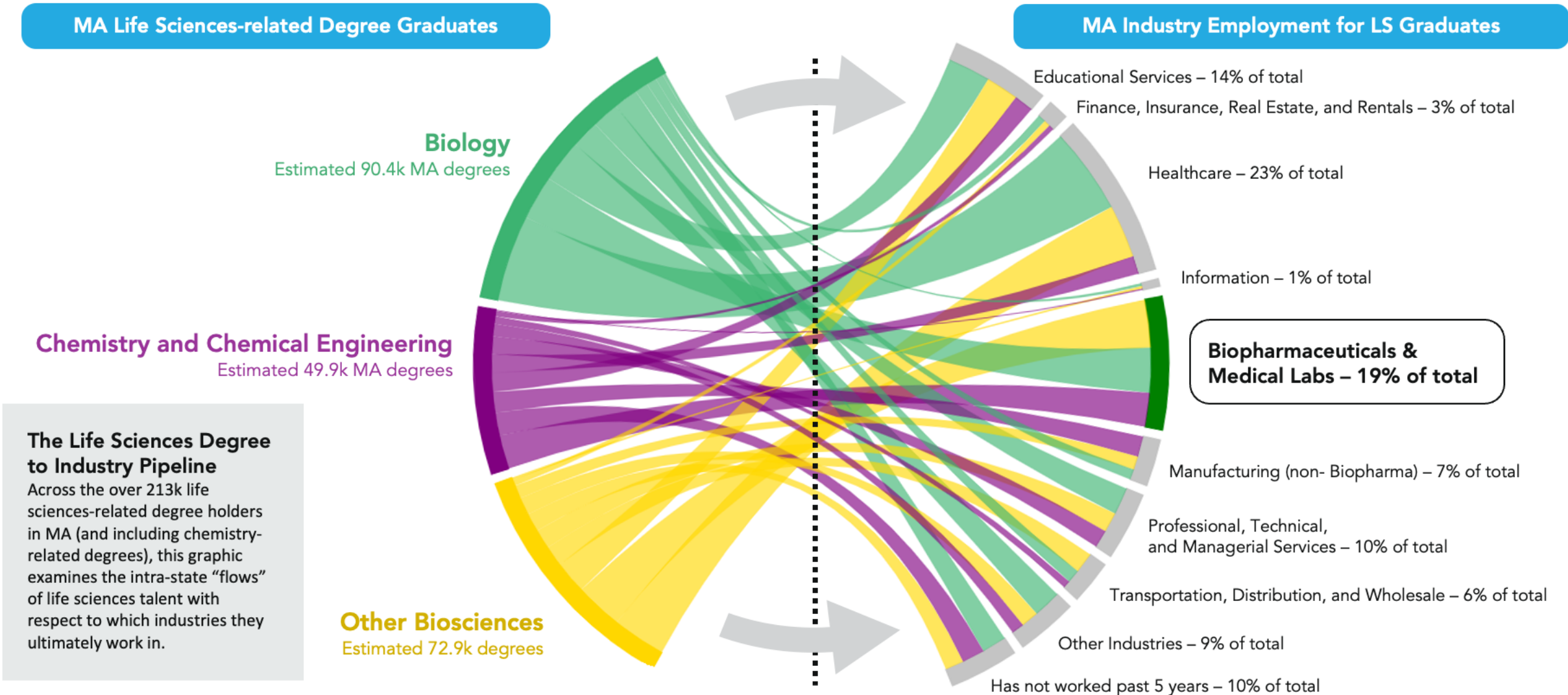
Scientists	27% growth
Management	31% growth
Computing & IT	47% growth
Engineering & Architecture	38% growth
Business & Financial	35% growth
Scientific Technicians	31% growth
Math & Statistics	53% growth

Segments listed with at least 1k projected new jobs and >30% job growth from 2023-2033

Projected Occupational Growth Trends Within Biopharmaceuticals & Medical Labs, 2023-33



# Biopharmaceuticals & Medical Labs Industry Only Capturing 1 in 5 Life Sciences & Chemistry Degree Holders Over Long Term in Massachusetts





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