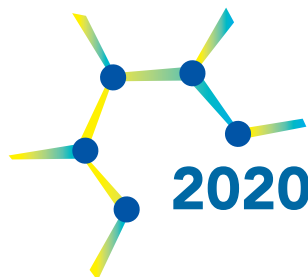




2020 Industry Snapshot

[MassBio.us/Industry-Snapshot](https://massbio.us/industry-snapshot)





2020 Industry Snapshot

with support from
Evaluate

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Industry Employment

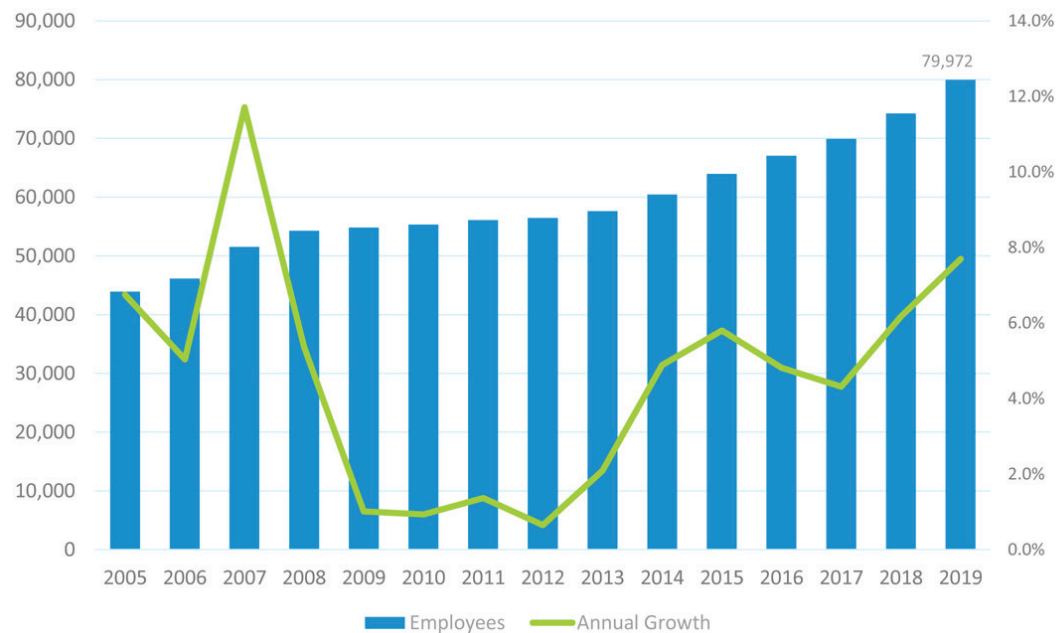
Massachusetts Biopharma Industry Employment



Industry Employment

Industry jobs grew by **94%** in the last 15 years adding over 38,000 jobs, and by **45%** in the last 10 years adding over 24,500 jobs.

In 2019, biopharma employment grew at **7.7%**, the fastest year-over-year rate since 2007.



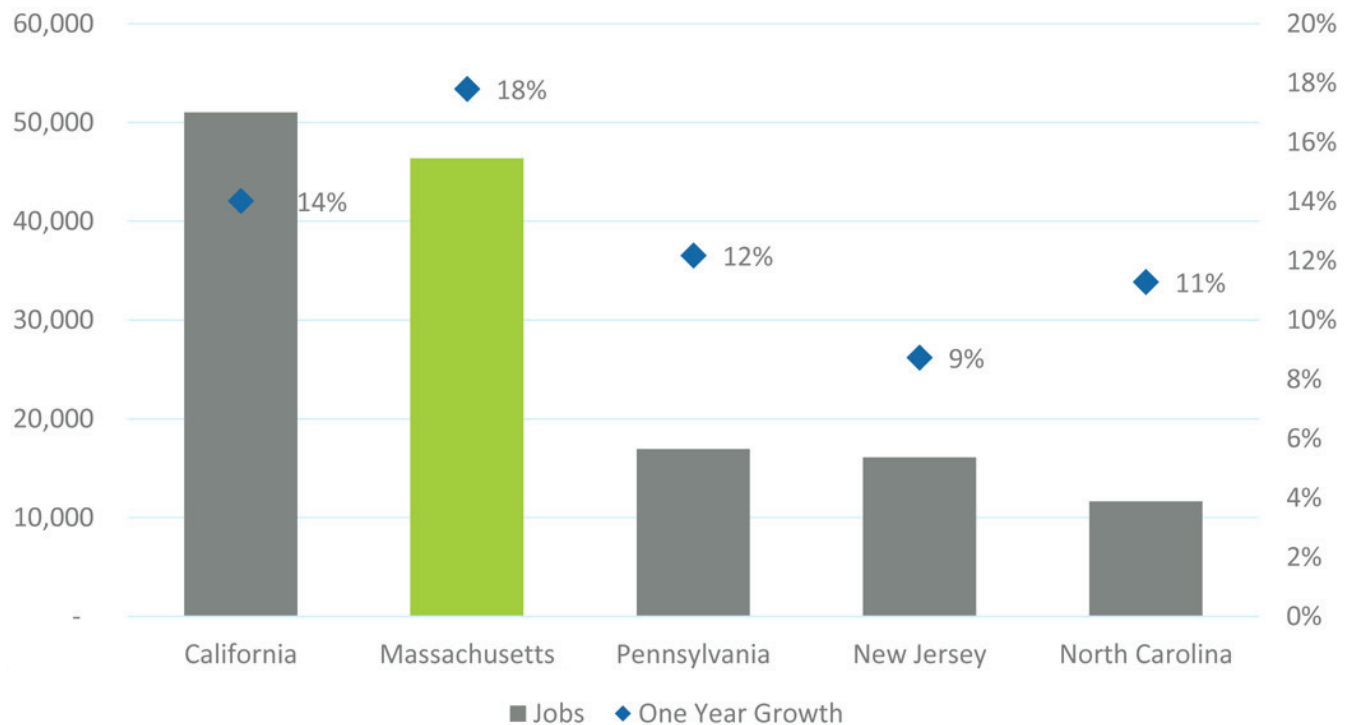
**94% growth
over 15 years**

Source: Privately owned companies, U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW)

One Year Biotech Research & Development Job Growth



Massachusetts biotech R&D jobs grew by **18%** last year alone, to over 46,000.



Source: Privately owned companies, U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW)

Largest Biopharma Industry Employers in Massachusetts

Industry Employment

Takeda is the **largest biopharma** employer in Massachusetts.

Rank	Company	Employees
1	Takeda	4,927
2	Sanofi	4,200
3	Biogen	2,446
4	Novartis	2,400
5	Pfizer	2,100
6	Vertex	1,957
7	Charles River Laboratories	1,715
8	MilliporeSigma	1,700
9	Parexel International	1,220
10	Foundation Medicine	1,139
11	AbbVie	1,090
12	EMD Serono	1,047

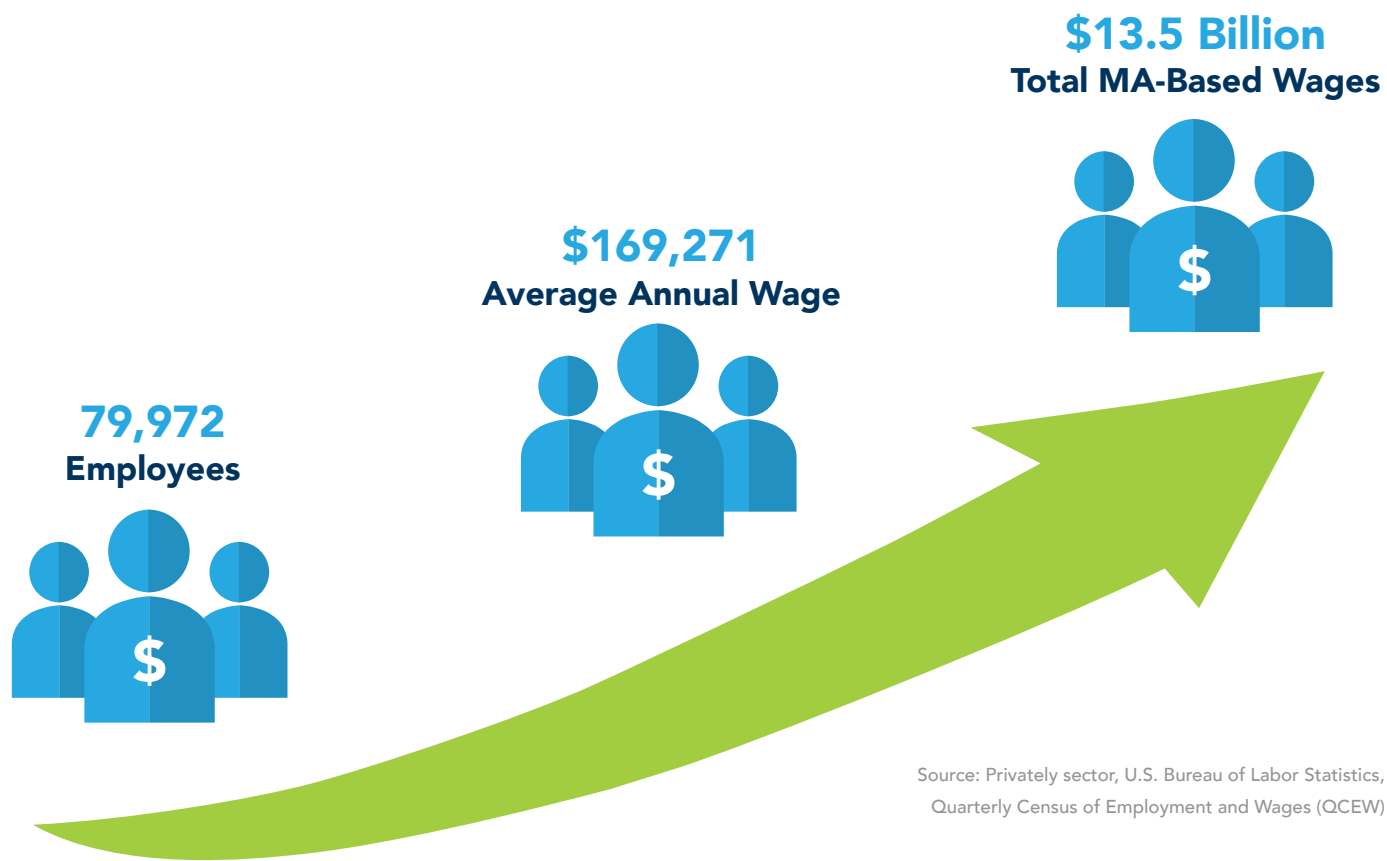
Rank	Company	Employees
13	Bristol Myers Squibb	1,035
14	Alnylam	1,000
15	Moderna	850
16	Alkermes	820
17	Merck	706
18	bluebird bio	700
19	Sarepta	607
20	Amgen	600
20	AstraZeneca	600
22	Sunovion Pharmaceuticals	590
23	Tesaro, A GSK Company	560
24	Agios	536

Sources: MassBio Membership Reports & Surveys; Boston Business Journal Book of Lists, 2020

Biopharma Economic Impact, 2019



Industry Employment

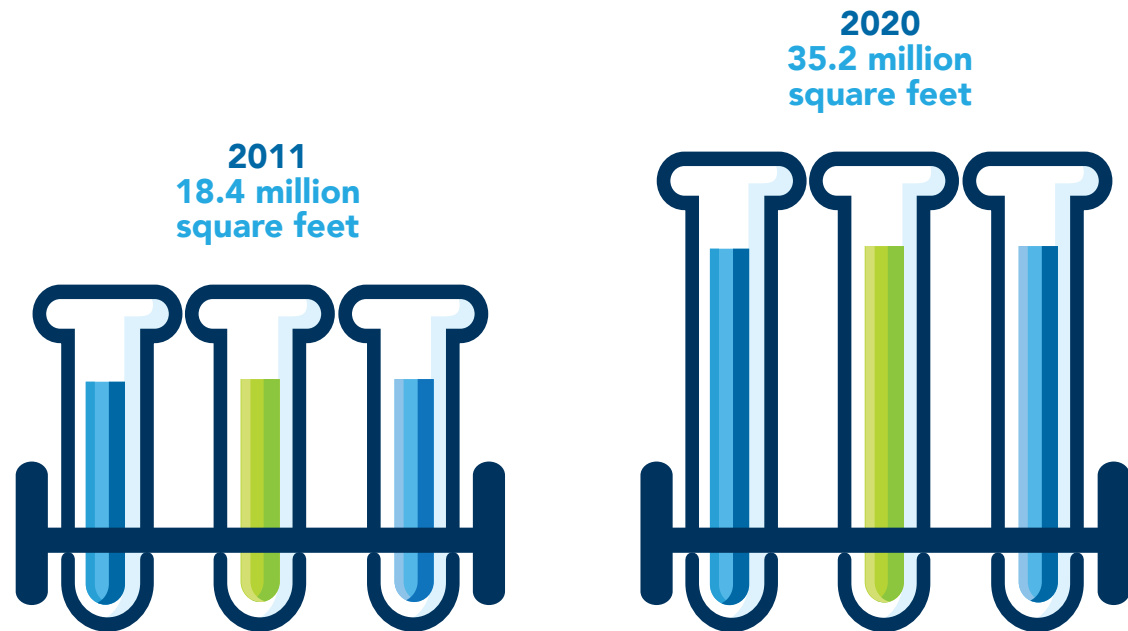


Life Sciences Lab Inventory Growth



Industry Employment

Over **16.5 million** square feet of commercial lab space has been built in Massachusetts over the last 10 years, an increase of **91%**.

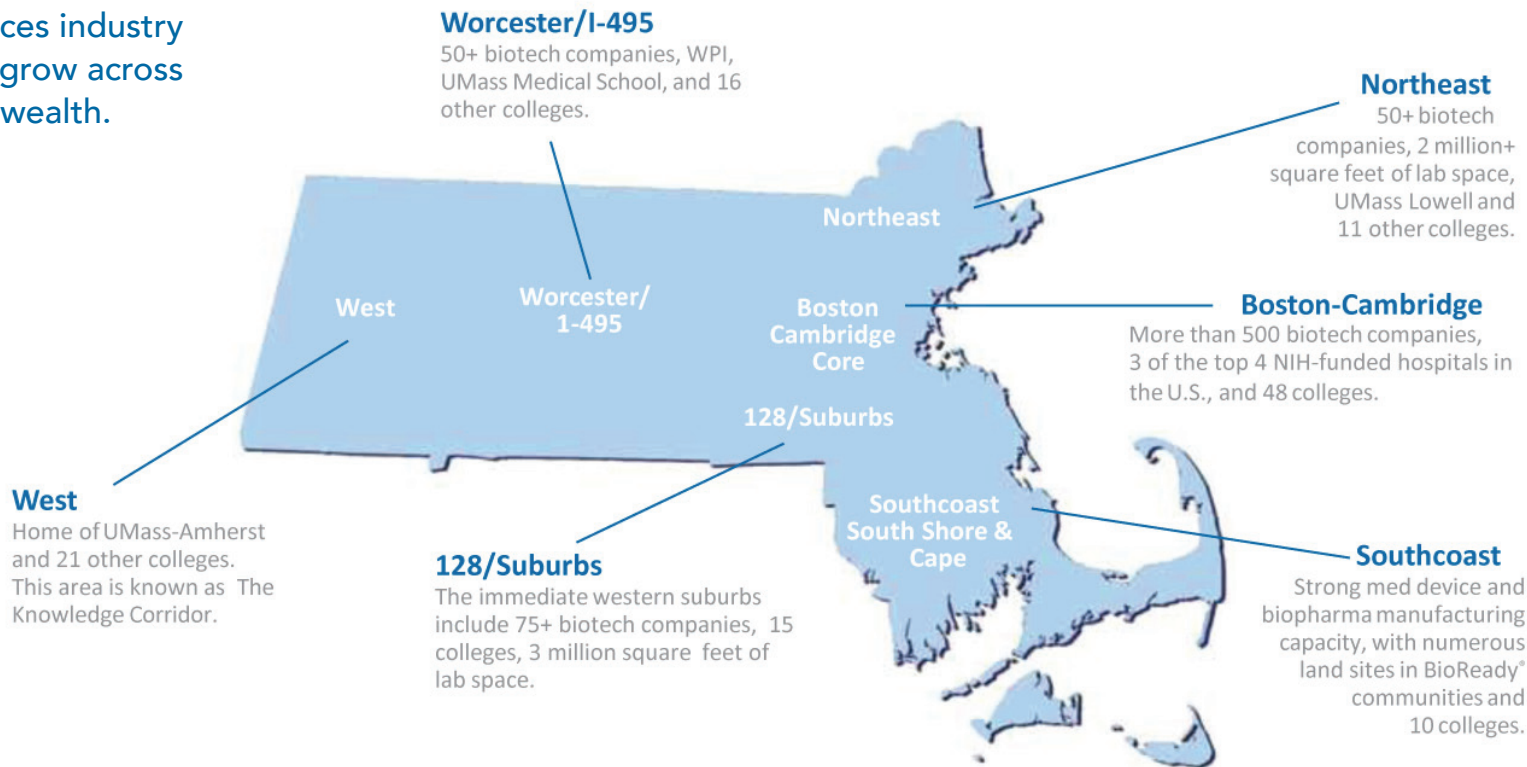


Sources: Colliers and CBRE

Industry Geography

Industry Employment

The life sciences industry continues to grow across the Commonwealth.





Investment in the Industry



Top NIH-Funded States: by Total Funding & Per Capita, 2019

Investment in
the Industry

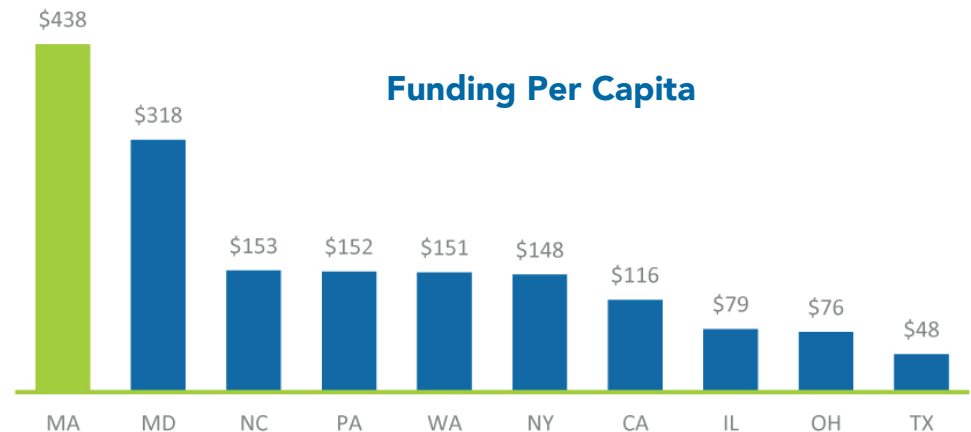


Just under 10% of all NIH funding went to Massachusetts organizations in 2019.

Total NIH Funding

State	Funding	Number of Awards
California	\$4,591,581,664	8,558
Massachusetts	\$3,024,098,902	5,548
New York	\$2,891,776,354	5,681
Pennsylvania	\$1,944,017,304	3,848
Maryland	\$1,920,138,523	2,621
North Carolina	\$1,589,742,045	2,557
Texas	\$1,370,180,699	3,056
Washington	\$1,135,332,133	1,747
Illinois	\$1,012,456,813	2,200
Ohio	\$883,089,814	1,899
US	\$30,885,907,765	59,528

Funding Per Capita



Source: NIH, Research Portfolio Online Reporting, U.S. Census Bureau

Top NIH-Funded Independent Hospitals, 2019

Investment in the Industry



Three of the top four NIH-funded independent hospitals are in Massachusetts.

Massachusetts receives 54% of all NIH funding to Independent Hospitals.

Organization	City	State	Awards	Funding
Massachusetts General Hospital	Boston	MA	959	\$499,645,254
Brigham and Women's Hospital	Boston	MA	567	\$338,400,990
Vanderbilt University Medical Center	Nashville	TN	506	\$284,934,924
Boston Children's Hospital	Boston	MA	375	\$196,100,744
Children's Hospital of Philadelphia	Philadelphia	PA	253	\$163,022,306
Dana-Farber Cancer Institute	Boston	MA	252	\$159,798,479
Cincinnati Children's Hospital Medical Center	Cincinnati	OH	307	\$149,617,325
Beth Israel Deaconess Medical Center	Boston	MA	238	\$129,999,391
St. Jude's Children's Research Hospital	Memphis	TN	124	\$105,947,511
Seattle Children's Hospital	Seattle	WA	153	\$89,766,004
Cedars-Sinai Medical Center	Los Angeles	CA	152	\$70,753,307
New York State Psychiatric Institute	New York	NY	118	\$65,150,157
Boston Medical Center	Boston	MA	79	\$57,660,481
McLean Hospital	Belmont	MA	98	\$52,836,845
National Jewish Health	Denver	CO	66	\$42,625,632
Roswell Park Cancer Institute Corporation	Buffalo	NY	68	\$37,844,503
Rhode Island Hospital	Providence	RI	74	\$35,351,062
Henry Ford Health System	Detroit	MI	44	\$32,254,098
Children's Hospital of Los Angeles	Los Angeles	CA	48	\$26,729,651
Massachusetts Eye and Ear Infirmary	Boston	MA	53	\$26,066,533
Children's Hospital of Los Angeles	Los Angeles	CA	41	\$22,295,828
Tufts Medical Center	Boston	MA	41	\$20,654,118

Please note:
NIH lists university-operated hospitals separately.

Source: NIH, Research Portfolio Online Reporting

Top MA NIH-Funded Higher Education & Research Institutes, 2019

Investment in the Industry



Massachusetts centers of Higher Education and Research Institutes received **\$1.38 billion in 2019.**

Organization	Awards	Funding
Harvard Medical School	374	\$195,688,539
Boston University Medical Campus	299	\$169,486,320
University of Massachusetts Medical School	345	\$155,485,455
Broad Institute	101	\$153,509,968
Harvard School of Public Health	165	\$133,377,748
Massachusetts Institute of Technology	245	\$112,793,279
Harvard University	152	\$86,228,374
Tufts University Boston	132	\$56,884,130
Boston University (Charles River Campus)	143	\$49,538,233
Northeastern University	83	\$33,098,921
University of Massachusetts Amherst	103	\$32,281,975
Brandeis University	80	\$31,728,052
Boston College	42	\$17,482,746
Joslin Diabetes Center	32	\$13,966,352
Schepens Eye Research Institute	31	\$11,860,244

Source: NIH, Research Portfolio Online Reporting

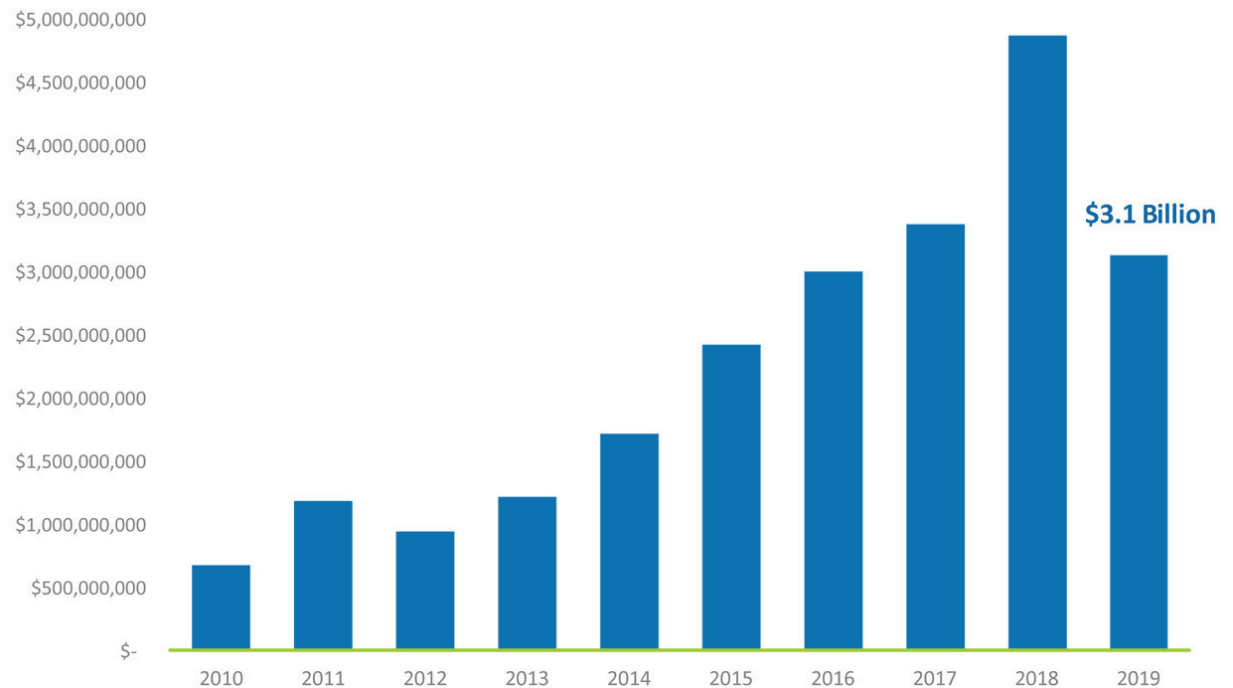
Venture Capital Investment: Biopharma

Investment in the Industry



Venture capital investment
in Massachusetts biopharma
companies was
\$3.1 billion in 2019.

In the first two quarters
of 2020, Massachusetts
biopharma companies
raised **\$2.1 billion**.



Source: PwC Money Tree Report Biopharma includes biotechnology, drug discovery, drug development, and pharmaceuticals/drugs.

Top Venture Capital financings in Massachusetts, 2019

Investment in the Industry



Anthos Therapeutics raised the largest financing round in 2019, totaling **\$250 million**, followed by ElevateBio at **\$150 million**.

Company	Financing (\$ million)	Investment Round
Anthos Therapeutics	\$250	Series Undisclosed
ElevateBio	\$150	Series A
Beam Therapeutics	\$135	Series B
FORMA Therapeutics	\$100	Series D
eGenesis	\$100	Series B
Black Diamond Therapeutics	\$85	Series C
Black Diamond Therapeutics	\$85	Series B
OncologiE	\$80	Series B
Oncorus	\$80	Series B
Arrakis Therapeutics	\$75	Series B
Inozyme Pharma	\$67	Series A
Ribon Therapeutics	\$65	Series B
Gelesis	\$63	Series Undisclosed
Imara	\$63	Series B
Frequency Therapeutics	\$62	Series C

Source: EvaluatePharma®, July 2020 Note: Excluding PIPE numbers.

Top Venture Capital Financings in Massachusetts, 2020 (Q1&2)

Investment in
the Industry



Massachusetts biopharma companies had a strong start to 2020, led by Atea Pharmaceuticals with a **\$215 million D round**.

Company	Financing (\$ million)	Investment Round
Atea Pharmaceuticals	\$215	Series D
ElevateBio	\$170	Series B
C4 Therapeutics	\$150	Series B
Affinivax	\$120	Series B
Generation Bio	\$110	Series C
Akouos	\$105	Series B
Kymera Therapeutics	\$102	Series C
Xilio Therapeutics	\$101	Series B
Cullinan Oncology	\$99	Series B
Checkmate Pharmaceuticals	\$85	Series C

Source: EvaluatePharma®, July 2020 Note: Excluding PIPE numbers.

Location of Venture Capital Backed Companies, 2019 in \$ millions

Investment in
the Industry



Cambridge-based
biopharma companies
received **59%** of all biotech
venture investment in
the state.



Source: EvaluatePharma®, July 2020

Massachusetts IPOs 2019

Investment in the Industry



There were **10 IPOs** from Massachusetts biotech companies in 2019.

23% of all US-based biotech IPOs in 2019 were from Massachusetts companies.



\$142 MM



\$78 MM



\$105 MM



\$75 MM



\$103 MM



\$75 MM



\$102 MM



\$72 MM



\$84 MM



\$71 MM

Note: Figures refer to "offer amounts" (investment secured) at time of IPO. Source: Nasdaq.com

Massachusetts IPOs 2020 (Q1&2)

Investment in
the Industry



There have been **7 IPOs** from Massachusetts biotech companies in the first half of 2020, raising an average of **\$187 million**.

33% of all US-based biotech IPOs in the first half of 2020 were from Massachusetts companies.

 **forma**
THERAPEUTICS. \$278 MM

 **BLACK
DIAMOND
THERAPEUTICS** \$231 MM

AKOUOS \$212 MM

 **Beam**
THERAPEUTICS \$207 MM

generation bio™ \$200 MM

 **KEROS**
THERAPEUTICS \$100 MM

 **imara** \$75 MM

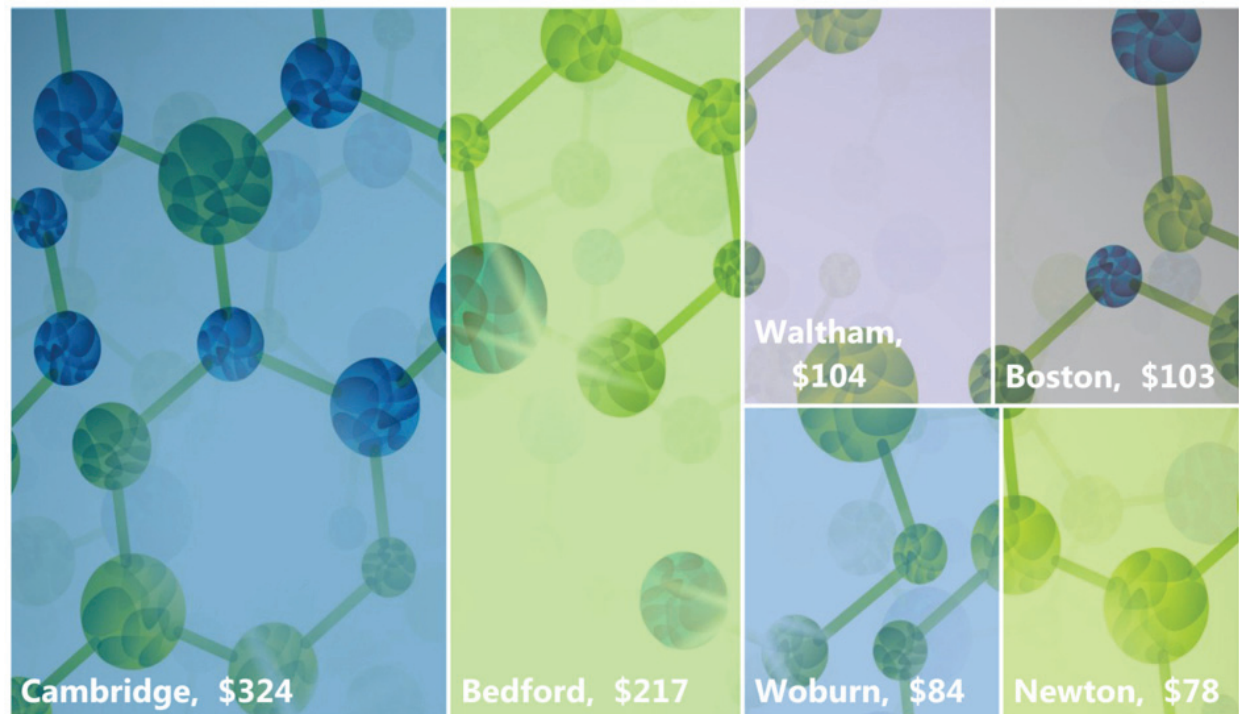
Note: Figures refer to "offer amounts" (investment secured) at time of IPO. Source: Nasdaq.com

Location of Companies with IPOs and Total Amount Raised, 2019 in \$ millions

Investment in
the Industry



In 2019, **64%** of all Massachusetts biotech companies that went public were located outside of Cambridge, raising a cumulative **\$676 million**.



Source: EvaluatePharma®, July 2020

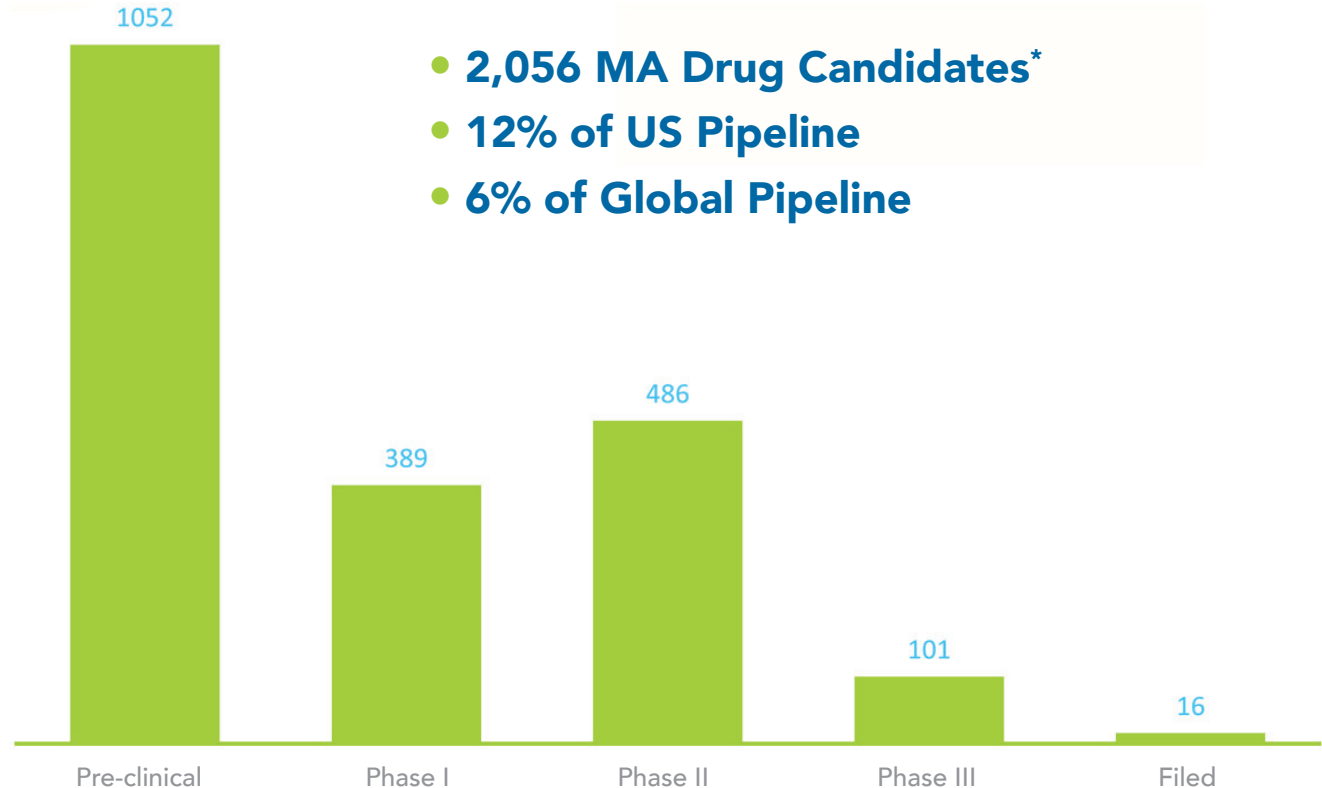


Drug Development Pipeline

Massachusetts Drug Development Pipeline

Drug Development Pipeline

The Massachusetts drug development pipeline includes **16 candidates** pending FDA approval.



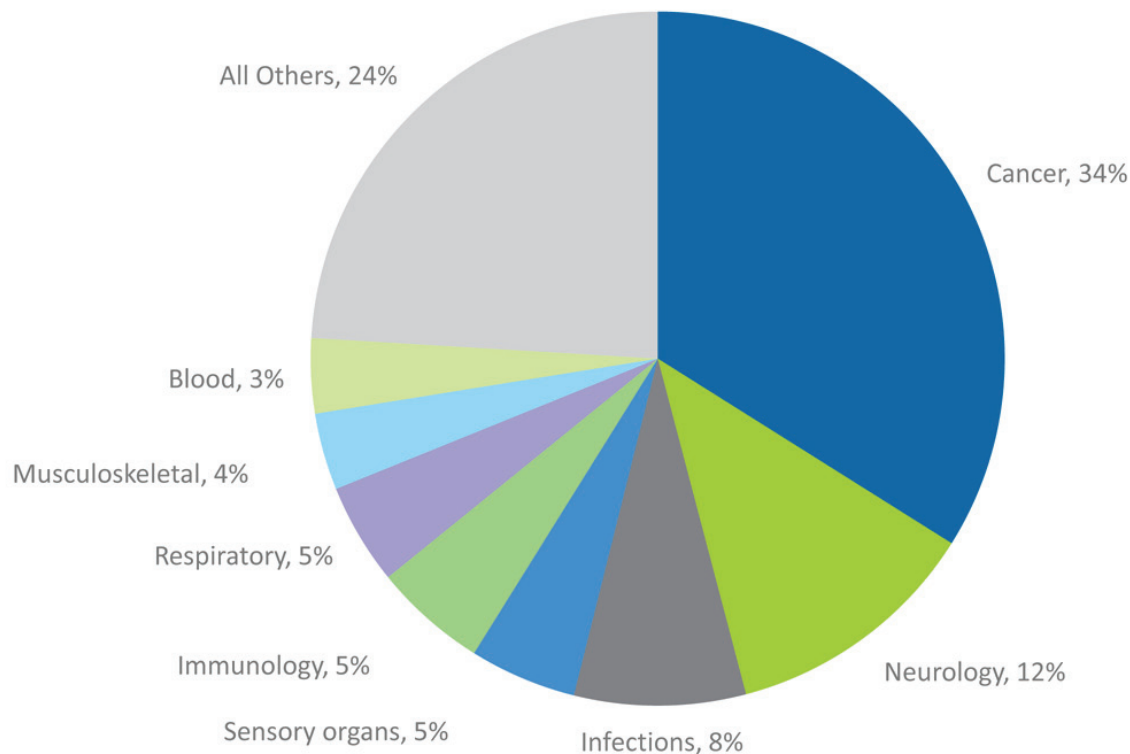
- **2,056 MA Drug Candidates***
- **12% of US Pipeline**
- **6% of Global Pipeline**

Only Massachusetts-headquartered company pipelines are included. Source: EvaluatePharma®, July 2020

Massachusetts Pipeline by Therapeutic Area

Drug Development Pipeline

Oncology continues to be the most frequently researched therapeutic area in Massachusetts.



Only Massachusetts-headquartered company pipelines are included. Source: EvaluatePharma®, July 2020

Massachusetts Pipeline by Medical Indication (Top 25)

Drug Development Pipeline

Massachusetts researchers are currently researching and developing products for patients with over **370 different medical indications.**

Medical Indication	Number of Investigational Drugs	% of all Investigational Drugs
Solid tumour indications	166	8.12%
General cancer indications	115	5.63%
Other neurological indications	50	2.45%
Undisclosed	48	2.35%
Other immune indications	42	2.05%
Alzheimer's disease	34	1.66%
Cystic fibrosis (CF)	34	1.66%
Non-small cell lung cancer (NSCLC)	32	1.57%
Duchenne muscular dystrophy	30	1.47%
General blood malignancies	29	1.42%
Non-Hodgkin lymphoma (NHL)	29	1.42%
Breast cancer	28	1.37%
Other metabolic indications	28	1.37%
General inflammatory disorders	27	1.32%
Ovarian cancer	27	1.32%
Amyotrophic lateral sclerosis (ALS)	26	1.27%
Melanoma	26	1.27%
Leukaemia, acute myeloid (AML)	23	1.13%
Parkinson's disease	21	1.03%
General eye disorders	18	0.88%
Wet age-related macular degeneration (AMD)	18	0.88%
Colorectal cancer	17	0.83%
Pancreatic cancer	17	0.83%
Sickle cell disease	17	0.83%
Gram negative infections	16	0.78%

Only Massachusetts-headquartered company pipelines are included. Source: EvaluatePharma®, July 2020

Changing the Lives of Patients

Drug Development Pipeline

**Massachusetts-headquartered companies
have developed therapies that treat
patient populations of up to**



**264 million patients
IN THE UNITED STATES**



**2 billion patients
AROUND THE WORLD**

Appendix

What's in a Number?

Why use the QCEW?

QCEW data is comprised of employment and wages from unemployment insurance (UI) tax reports submitted by employers and is augmented by both BLS worksite reports and the Annual Re-filing Survey (ARS), which surveys one quarter of all private-sector establishments each year. The QCEW data is available on a more timely basis than the CBP and is directly related to the state's ES-202 data, providing an additional, ongoing corroborative source.

What is considered "biopharma" employment?

Using the North American Industry Classification System (NAICS), with which QCEW data is reported, MassBio has determined that several NAICS classifications can be considered part of the biotechnology and pharmaceutical industry. However, only in certain cases can the industry claim 100% of any one NAICS code. MassBio determined that a percentage of some industry classifications could be used in estimating overall industry employment. In some cases, the percentage determination for certain industry codes was based on reports developed by other organizations. The following NAICS codes are utilized:

NAICS 3254: Pharmaceutical MFG, including Biologics (100%)

NAICS 541714 Research and Development in Biotechnology (except Nanobiotechnology) (100%)

NAICS 541715 Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (27% in 2017 and beyond, 22% for 2016 and prior.)

NAICS 541713 Research and Development in Nanotechnology (22%)

NAICS 334516: Analytical Laboratory Instrument MFG (30%)

NAICS 54138: Testing Laboratories (9%)

NAICS 622: Hospitals (4.5%)

NAICS 61131: Universities (1.9%)

NAICS 621511: Medical Testing Laboratories (100%)

As of 2017 data, NAICS 541711, Research and Development in Biotechnology and NAICS 541712, R&D in Physical, Engineering, and Life Sciences (except biotech) have been replaced by 541714 and 541715 respectively. NAICS 541715 was created from parts of the previous NAICS 541711 and NAICS 541712 and now stands alone in the 2017 data.

NAICS 4242, Drug merchant wholesalers, is no longer included in any current or annual employment figures. NAICS 621511, Medical Laboratories, is included. Prior to 2013, we omitted Medical Laboratories, as these laboratories are health care services related, providing services to the medical delivery and patient care system, rather than the Biopharma research development and manufacturing industry. We now acknowledge that Medical Laboratories are closely connected to the Biopharma industry, requiring similar capacity and skills found in the Biopharma industry.

About Us

MassBio's mission

is to advance Massachusetts' leadership in the life sciences to grow the industry, add value to the healthcare system, and improve patient lives. MassBio represents the premier global life sciences and healthcare hub, with 1,300+ members dedicated to preventing, treating, and curing diseases through transformative science and technology that brings value and hope to patients. Founded in 1985, MassBio works to advance policy and promote education, while providing member programs, events, industry information, and services.



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MassBio West

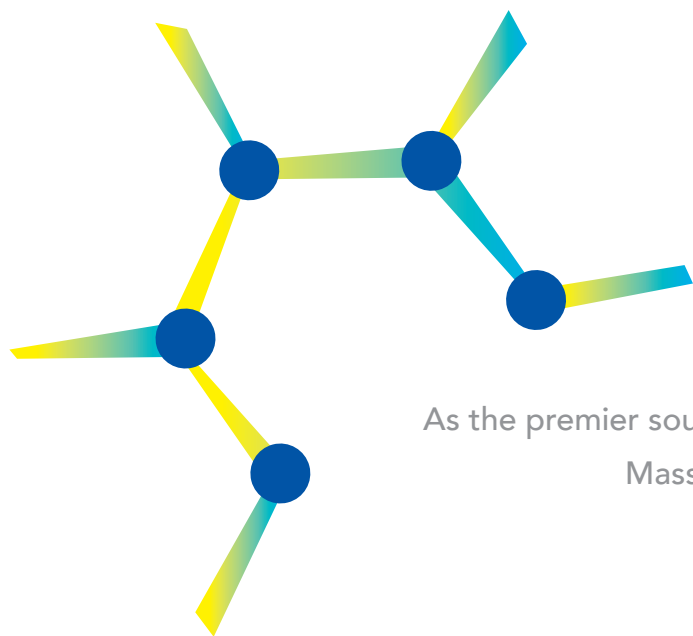
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As the premier source of information on life sciences in Massachusetts, MassBio tracks industry statistics over time and issues an overview Industry Snapshot each year.

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