

# THE INNOVATIVE BIOPHARMACEUTICAL INDUSTRY'S SUPPORT FOR STEM EDUCATION IN: MASSACHUSETTS



The Biopharmaceutical Industry's Sustained Commitment to Inspiring and Advancing Tomorrow's STEM Workforce

*A high-skilled technical workforce that is proficient in science, technology, engineering, and mathematics (STEM) is increasingly important to sustained economic growth and U.S. global competitiveness. However, as the U.S. continues to lag behind other countries in terms of STEM literacy and expertise, there are legitimate concerns in the nation's ability to produce enough qualified workers to meet the demands of the global knowledge-driven, STEM-intensive economy and to develop workers with the relevant skills needed for the jobs of the future. **Inspiring and developing the next generation of STEM talent is critical to the economic success of Massachusetts.***

STEM talent is especially important to the success of the nation's biopharmaceutical industry, one of the economy's most innovative sectors employing more than five times the level of STEM workers compared with the overall U.S. economy. **In Massachusetts, the biopharmaceutical industry directly employs 60,738 and has a total economic impact of more than 284,000 state jobs and \$70.9 billion in total economic output.**<sup>1</sup>

**Massachusetts will need to fill nearly 359,000 STEM jobs by 2026.** Although an analysis of a series of STEM education indicators finds that Massachusetts students generally rank highly in terms of their proficiency in STEM, opportunities for improvement remain.

**To help inspire and develop the next generation of STEM workers, the innovative biopharmaceutical industry supports 12 programs in Massachusetts and 10 programs nationwide.**

Number of STEM Programs Supported by the Biopharmaceutical Industry in Massachusetts<sup>2</sup>

**12**

Number of National STEM Programs Open to MA Students and Teachers

**10**

Projected STEM jobs to Fill in MA by 2028<sup>3</sup>

**358,950**

National Assessment of Educational Progress State Ranking for MA Students<sup>4</sup>

	4th Grade	8th Grade
Math	<b>2</b>	<b>1</b>
Science	<b>5</b>	<b>4</b>

Share of Graduating MA High School Students Interested in STEM Major or Career<sup>5</sup> (U.S. = 48%)

**49%**

Biopharmaceutical Industry Economic Footprint in Massachusetts<sup>6</sup>

**60,738**  
Direct Jobs

**\$70.9 B**  
Total Output

## Biopharmaceutical Industry-Supported STEM Education Programs in Massachusetts

The **Amgen Foundation** supports two STEM education programs that are available to Massachusetts students as well as several others available nationwide:

- The **Amgen Biotech Experience**, in partnership with the Life Sciences Outreach Program at Harvard University, provides high school educators with biotechnology-themed professional development, teaching materials, and research-grade lab equipment.
- The **Amgen Biology Teacher Education Program**, in partnership with MIT, offers cutting-edge, competency-based education for life sciences teachers at middle and high schools.

The **Biogen Foundation** encourages STEM education across Massachusetts through a variety of targeted programs:

- The **Biogen Foundation's STAR Initiative** (Science, Teacher Support, Access & Readiness), which strengthens STEM education opportunities for public school students in Cambridge and Somerville who have been historically underrepresented in STEM. The initiative partners with six high-performing nonprofit organizations to launch and expand community programs and services.
- The **Biogen Community Lab**, which encourages local high school students from low-income households or groups underrepresented in STEM to learn about the drug development process, explore laboratory techniques, and engage with Biogen employees.
- **Science On-The-Go Toolkits**, all-inclusive kits that employees can borrow when visiting a classroom, special group or event to help engage students in science and Biogen's work.
- The **SPARK Video Contest**, an annual program available to middle and high school students that encourages them to create fun and creative educational videos on biotechnology.
- The Biogen Foundation **U.S. Grant Program**, which funds activities across Massachusetts to support STEM, including teacher professional development, student engagement programs, and others.

The **GlaxoSmithKline Science in the Summer** program provides high-quality STEM experiences to students who would otherwise lack access, especially during summer breaks when school is out of session. In Massachusetts, the program is offered through partnerships with the Berkshire Museum in Pittsfield, and the EcoTarium in Worcester.

The **Novartis Institute for Biomedical Research (NIBR)** supports The **Community Exploration & Learning Lab (CELL @ Novartis)**, which allows middle and high school students in Cambridge to conduct hands-on experimentation and minds-on problem solving activities in their own neighborhood.

**Sanofi** supports a variety of activities to support STEM education in Massachusetts, especially among university students and recent graduates:

- **The Student Success Center (SSC)** at UMass Boston, a program that supports undergraduate STEM students through dedicated advisory services and programming.
- **Fellowships** at the Massachusetts College of Pharmacy & Health Sciences designed for post-PharmD individuals with a Doctor of Pharmacy to further their experience in the pharmaceutical industry through work experience and clinical research.

**UCB** provides support for multiple programs that offer undergraduate and graduate scholarships and fellowship funds in STEM fields, including at the Department of Epidemiology at the Harvard T.H. Chan School of Public Health, among others.

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## Industry-Supported STEM Education Programs Nationwide

With an emphasis on student engagement, teacher development, and dynamic learning opportunities, PhRMA members **Amgen, AstraZeneca, Bayer, Genentech, and Johnson & Johnson** also support 10 STEM education programs nationwide. Read more about these programs [here](#).

- 1 *The Economic Impact of the U.S. Biopharmaceutical Industry: 2017 National and State Estimates, PhRMA and TEconomy Partners, December 2019.*
- 2 *PhRMA-TEconomy "The Biopharmaceutical Industry's Sustained Commitment to Inspiring and Advancing Tomorrow's STEM Workforce" 2020.*
- 3 *TEconomy's Analysis of Projections Managing Partnership Occupational Employment Projections for 2018-2028. Projections data reflect the 2016-26 period for the following states: AL, AZ, CT, KS, KY, MA, NM, OK, TX, VT, WA, WV.*
- 4 *U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2019 Mathematics Assessment and 2015 Science Assessment.*
- 5 *Percentage of ACT-Tested High School Graduates Scoring Expressing Interest in STEM Majors, Occupations, and/or Activities; ACT: The Condition of STEM 2017 State Profiles.*
- 6 *The Economic Impact of the U.S. Biopharmaceutical Industry: 2017 National and State Estimates, PhRMA and TEconomy Partners, December 2019.*