

WOMEN, GIRLS AND STEM:

BUILDING A 21ST CENTURY WORKFORCE TO DEVELOP THE MEDICINES OF TOMORROW

A diverse talent pool of science, technology, engineering and math (STEM)-literate Americans prepared for the jobs of the future will be essential for maintaining the national innovation base that supports key sectors of the economy and for making the scientific discoveries and developing new treatments and cures. While challenges remain to engage, attract, and support girls and women in STEM education and careers, the biopharmaceutical and broader life-sciences industries has made progress in closing STEM gaps and is focused on increasing diversity, equity and inclusion in STEM.

STEM IS THE PIPELINE TO FUTURE INNOVATION

- The STEM workforce accounts for over 50% of U.S. economic growth and is particularly key to research-intensive industries like the innovative biopharmaceutical industry.¹
- The STEM workforce is particularly important to biopharmaceutical manufacturing, which has 4 times greater concentration of STEM jobs compared to the rest of the economy.²
- Biopharmaceuticals are one of only a few high-tech sectors projected to add STEM-related manufacturing jobs by 2020.³
- Yet, the manufacturing sector alone is predicted to need about 3.5 million jobs by 2025, 2 million of which may go unfilled because of a lack of highly skilled STEM workers.⁴

RECENT PROGRESS

- From 1990 to 2013, female graduates in STEM fields increased by 130%.⁵
- Between 1993 and 2015, the number of women nearly tripled among life scientists (an increase of 175%).⁶
- In 2015, gender parity in S&E occupations was close among life scientists (48% women) and the largest component of life sciences, biological and medical scientists, had reached gender parity (53% women).⁶
- The increases in participation by women in science and engineering over the past 20 years includes increasing participation by members of all racial and ethnic groups, especially women; however, minority women comprise fewer than 1 in 10 employed scientists and engineers.⁷

"I remember feeling intimidated by science... but I had several teachers who empowered me along the way, and that's why I feel the obligation to do the same for young girls today."

—Keya Pitts, executive director of Pharmacovigilance Quality Assurance, Astellas

¹ U.S. Science and Engineering Labor Force Stalls, but Trends Vary Across States. (2012, February 15). Retrieved November 10, 2015, from <http://www.prb.org/Publications/Articles/2012/scientists-engineers.aspx>

² Teconomy 2017 report – Enhancing Today's STEM workforce to Ensure Tomorrow's New Medicines: Biopharmaceutical Industry partnerships with US colleges and universities <http://phrma-docs.phrma.org/files/dmfile/TEconomy-PhRMA-STEM-Report-Final.pdf>

³ <https://www.bls.gov/emp/tables/industry-employment-and-output.htm>

⁴ (National Association of Manufacturing and Deloitte <https://www.emerson.com/en-us/news/corporate/2018-stem-survey>)

⁵ Reaching the Full Potential of STEM for Women and the US economy

⁶ 2018 National Science Board Indicators

⁷ National Girls Collaborative Project, 2016

While challenges remain to encourage more women and girls to enter STEM careers, these findings reinforce the need for the public and private sectors to expand our collective efforts to address the STEM skills gap and to encourage and support women and girls in STEM from the classroom to the lab to the board room.

“The pace of innovation is accelerating globally, and with it the competition for scientific and technical talent. Now more than ever the innovation capacity of the US—and its prosperity and security – depends on an effective and inclusive STEM education ecosystem”

—President’s National Science and Technology Council, Dec 2018

STATE OF WOMEN AND GIRLS AND STEM

Research finds that while girls outperform boys in math and science in middle school girls begin to lose confidence in their knowledge and skills, and interest in STEM, through high school.⁹

Only a fraction of girls and women are likely to pursue STEM degrees and careers:⁹

- According to a Brookings Hamilton Project study, women earn 57 percent of all four-year degrees, but only 35 percent of STEM bachelor’s degrees.
- Following degree completion, women account for just 22 percent of the STEM workforce, and are responsible for only 16 percent of granted patents.

However, challenges remain:

- Women who start out in business roles in tech-intensive industries leave for other industries at high rates—53% of women, compared to 31% of men.¹⁰
- Almost one-third of women in the United States (32%) and China (30%) intend to leave their STEM jobs within a year.¹¹
- In life science careers, women fill half of the industry’s entry-level positions, but make up only 20% of leadership team and 10% of boards.¹²

⁸ <https://www.ncgs.org/wp-content/uploads/2017/11/Sharing-Solutions-2015-Advancing-Girls-in-STEM.pdf>

⁹ <https://www.ncgs.org/research/database/closing-the-stem-gap/>

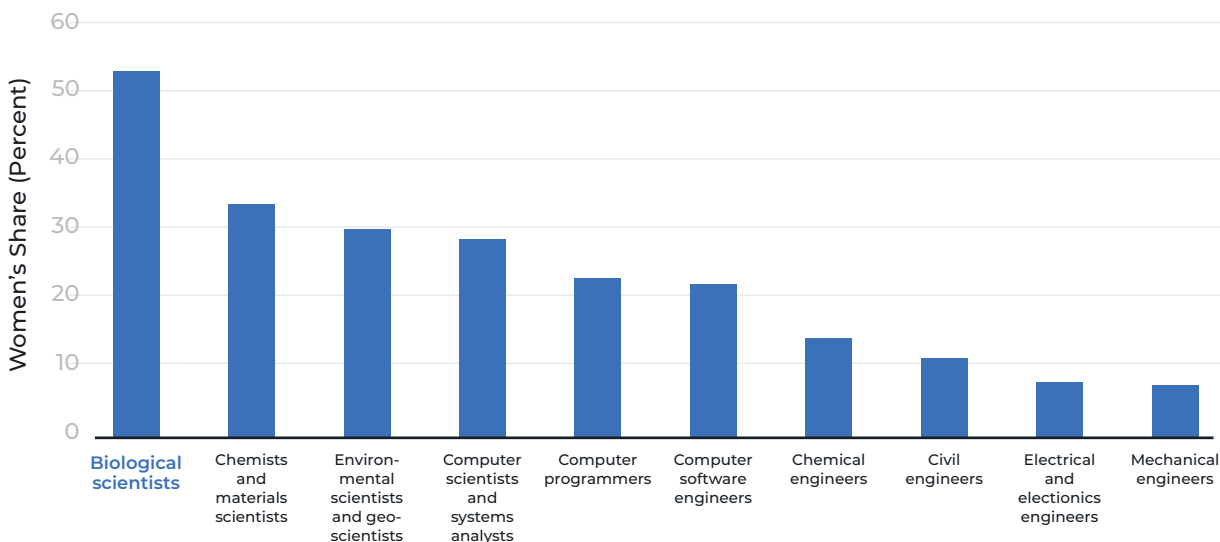
¹⁰ Anna Beninger, High Potentials in Tech-Intensive Industries: The Gender Divide in Business Roles (Catalyst, 2014): p. 3.

¹¹ Sylvia Ann Hewlett, Laura Sherbin, Fabiola Dieudonne, Christina Fagnoli, and Catherine Fredman, Athena Factor 2.0: Accelerating Female Talent in Science, Engineering & Technology: Executive Summary (Center for Talent Innovation, 2014).

¹² Study by MassBio and LiftStream

On the positive, a closer examination of women in specific STEM fields finds that women represent more than 50% of the biological scientists.¹³

WOMEN ARE UNDERREPRESENTED IN MANY SCIENCE AND ENGINEERING OCCUPATIONS



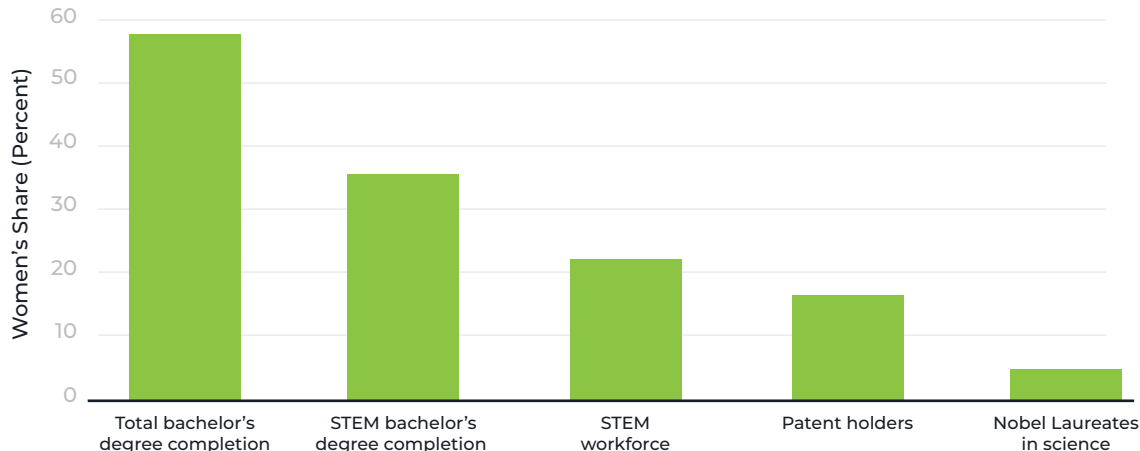
Source: U.S. Department of Labor. Bureau of Labor Statistics. 2009. Women in the labor force. A databook (Report 1018) (Washington, DC) Table 11

“Without the right guidance and support, entering the world of STEM can be an isolating experience for women. I was fortunate to find mentors at different points during my education and career, who helped me to navigate this exciting, challenging and innovative field. Through ‘Tomorrow’s Innovators,’ I can share those learnings with the next generation of STEM leaders.”

—Litao Zhang, vice president of Leads Discovery and Optimization and Discovery Genomics for Bristol-Myers Squibb

¹³ <https://nsf.gov/statistics/2018/nsb20181/report/sections/science-and-engineering-labor-force/women-and-minorities-in-the-s-e-workforce#women-in-the-s-e-workforce>

WOMEN REPRESENT MORE THAN 50% OF THE BIOLOGICAL SCIENTISTS



<https://www.brookings.edu/blog/brookings-now/2018/02/09/charts-of-the-week-advancing-women-and-girls-in-science/>
Source: Current Population Survey 2016; National Women's Business Council 2012; Nobelprize.org 2017

WHAT IS THE BIOPHARMA INDUSTRY DOING TO ADVANCE WOMEN AND GIRLS IN STEM?

- PhRMA member companies and their foundations have supported over 90 STEM programs focused on both students and teachers.¹⁴
- Over a 5-year period, PhRMA member company STEM programs have impacted over 1.6 million students and 17,500 teachers.¹⁴
- 85% of programs were focused on the way K-12 STEM education is taught in the U.S. by engaging younger students and early education teachers.¹⁴
- Over 30 PhRMA member programs are focusing on increasing diversity in STEM fields by providing students of all backgrounds, particularly women and minorities, experience with hands-on, inquiry-based scientific learning opportunities.¹⁴
- PhRMA member company efforts include challenging gender stereotypes by exposing girls to examples of women who have succeeded in STEM through mentoring programs and opportunities for hands-on lab experiences with women scientists. These efforts making it easier for girls to see themselves studying STEM.

LEARN MORE AT PhRMA.ORG/STEM

¹⁴ 2014 stem report - <http://phrma-docs.phrma.org/files/dmfile/stem-education-report-20144.pdf>