



2021

INCLUDE. INSPIRE. INNOVATE.

Annual Report

Building and sustaining a talented
and diverse life sciences workforce.



A Message from Our CEO Sunny Schwartz

2021 was a significant year for MassBioEd. It was more than a year of celebrating 20 years of building a talented and diverse life sciences workforce. We achieved milestones in our programs reaching historically underrepresented communities. Our [Diversity, Equity, and Inclusion Statement](#) is central to our mission. MassBioEd provides opportunities to underserved and underrepresented youth and adults for science education, entry into, and persistence in life sciences careers and bridges gaps for diverse students, job seekers, and communities to connect with life sciences companies and their representatives. We do this through intentional and thoughtful partnerships with diverse individuals, groups, and organizations.

This past year, we launched the first-in-the-nation Life Sciences Apprenticeship program that transitioned 30 Massachusetts residents to full-time employment as Biomanufacturing Technicians and Clinical Trial Associates. The collaborative program supports companies as they seek to fill persistent vacancies in these high-demand jobs, while providing accelerated training to individuals new to industry to gain foundational knowledge and acquire industry-recognized skills as they enter meaningful careers with sustainable wages. The first cohort of apprentices consisted of 63% People of Color and 60% women. Individuals' wages increased by 158% compared to prior to the program.

We were proud to have Governor Charlie Baker join us during National Apprenticeship Week at ArrantaBio where he presented MassBioEd with a proclamation from the State of Massachusetts and announced new funding to expand apprenticeship programs, as well as our Champions for Biotechnology Education Awards Reception. Our dedicated employers, training providers, volunteers, and apprentices continue to make this program a success as we double the number of individuals participating in the program in 2022.

Concurrently, our ACCESS Program expanded into four new public-school districts: Chelsea, Randolph, Revere, and Frontier Regional in western Massachusetts, joining Match Charter Public School in Boston, Boston Preparatory Charter Public School, and the Innovation Academy Charter School in Tyngsborough. The intensive three-year program is designed to build institutional knowledge through an internal sustainable coaching network in the district-wide community, providing quality biotechnology lab and career exploration experiences for middle and high school students in high-need districts.

We also expanded our remote professional training courses, fully embracing the new workplace dynamic. Over 500 individuals enhanced their skills in a variety of our trainings, such as leading teams, presenting with persuasion, honing their English language skills, deepening their project management and business of biotech understanding, and more. As new demands continue to come into play, we will tailor our offerings to ensure that we meet the needs of employers.

MassBioEd will continue to serve as a catalyst for diversity, equity, inclusion, and belonging in the life sciences. We welcome collaboration and open dialogue to continue to elevate the talent pool in Massachusetts, the leading center for life sciences.

Let us continue this great work to expand opportunities for individuals to join this thriving ecosystem and create a strong and diverse workforce for a growing industry. We look forward to exploring new pathways and meeting new partners to carry our shared vision forward.

Sincerely,

A handwritten signature in black ink that reads "Sunny Schwartz". The signature is fluid and cursive, with the first letters of "Sunny" and "Schwartz" being capitalized and prominent.

Sunny Schwartz



Our Purpose

The life sciences are critically important for our health, economy, and environment. The last two decades have shown an amazing progression of life science knowledge and industry that culminated in world-wide impact when needed most.

Developing a strong workforce is central to our mission, focusing on high-quality K-12 science education, connecting students and adults to professionals to increase career awareness, supporting entry for adult workers to meaningful jobs with family-sustaining wages and career growth opportunities, and providing training to incumbent workers.

We are committed to addressing the following issues:

- **Students are underprepared in science and unaware of career opportunities in the industry.**
- **Teachers are under supported to provide lab-based lessons to students.**
- **Demand for skilled workers continues to outpace supply.**
- **Individuals from underserved and diverse communities have historically been left out of the life sciences industry's growth.**

"2021 was an outstanding year for MassBioEd. The Foundation grew and expanded programs to meet demand for impactful education and workforce development programming in Massachusetts.

As the first in the nation to develop a certified Life Sciences Apprenticeship Program, MassBioEd is poised to be a successful leader in developing a diverse pipeline of talent for the industry, spanning the region and invigorating the economy of local communities. I am proud to have served as Board Chair and to work with this dedicated and talented team. The best is yet to come."

CHRISTOPHER MURPHY
MassBioEd Board Chair

Our Approach

MassBioEd strengthens the life sciences workforce through intentional programs and thoughtful partnerships with diverse individuals, groups, and organizations.

Our work supports the emerging, imminent, and incumbent workforce through two primary programs, BioTeach and BioTalent.

1

Emerging Workforce

Engaging educators, inspiring students grades 6-12.

- TEACHER TRAINING AND MENTORING
- CURRICULUM DEVELOPMENT
- EQUIPMENT GRANTS & AWARDS
- CAREER EXPLORATION
- COMPREHENSIVE DISTRICT PARTNERSHIPS

2

Imminent Workforce

Illuminating careers for college students and adults.

- INDUSTRY & ACADEMIC COALITIONS
- JOB FAIRS
- CAREER INFORMATION
- APPRENTICESHIPS

3

Incumbent Workforce

Building skills of the current workforce.

- INCUMBENT WORKER TRAINING
- LABOR TRENDS REPORT
- LIFE SCIENCES WORKFORCE CONFERENCE



Through BioTeach, we support teachers and inspire middle and high school students through:

- Biotech curriculum with career content and virtual activities freely accessible online.
- Equipment grants and loans for schools with mentoring support to deliver inquiry-based lab explorations.

- Professional development training for teachers to support implementation of hands-on lab activities.

- District-wide, multi-year program for grades 6-10 focused on high-need schools, working with teachers to support vertical alignment with goal of self-sustainment.



- Apprenticeships for non-traditional students
- Career awareness and engagement events for college students and adults
- Annual Life Sciences Workforce Conference

- Labor market information for educators and industry

- Biotech and soft skills training for industry professionals



“It was great to see the connection between different lessons related to our ecosystems from 5th grade to upper grades.

Having the opportunity to see how my lessons will impact other grades’ learnings will make me improve or look for other resources to teach my lessons and to help my students in the future grades.”

CHELSEA

Middle School Teacher

Jan 21, 2021

Middle School through High School

School Year 2020-2021

CURRICULUM

MassBioEd develops authentic, student-centered investigations that are free, standards-aligned, and inexpensive to implement. All BioTeach curricular materials are available online and supported through a learning community.

- **147 teachers downloaded BioTeach state-aligned curricula** from an online library of 20+ biotechnology lab activities, including a course that outlines the first year of a two-year Biotechnology career and technical education (CTE) pathway.
- The most viewed curricular pathway on LabXchange, “Bacterial Transformation,” by BioTeach, has been **viewed over 2,700 times**.

TEACHER TRAINING

We provide teachers with the skills and knowledge to implement innovative life sciences labs, develop cutting-edge life sciences lessons, and deliver authentic lab-based curricula.

- **173 teachers** from a total of 134 schools, including 80 middle and high schools in Massachusetts, completed BioTeach professional development training, engaging **over 12,500 students** in authentic science learning.
 - 54 teachers earned the professional development points needed to maintain their professional status
 - 8 teachers earned graduate credit through our collaboration with Westfield State University.

SCHOOL PROGRAMS

BioTeach provides students in underserved schools with authentic laboratory experiences and modern equipment and provides teachers with relevant curricula, training, and mentoring.

- **18 schools** received equipment grant and mentoring packages, totaling **\$36,000 in equipment and supplies**.
- **6 school districts** participated in our Aligned Curricular and Career Experiences for Secondary Science **ACCESS** program, impacting **2,141 students** from middle and high schools.
 - 100% of schools are high-needs or economically disadvantaged as defined by DESE or underserved
 - Public School Districts include: Match Charter Public School, Innovation Academy Charter School, Boston Preparatory Charter Public School, Frontier Regional School, Chelsea Public Schools, and Randolph Public Schools.



"I truly have no words to express the immense gratitude I feel in this moment. Thank you for not only making the introduction but seeing me for who I am and believing in my potential. You have truly helped make my and my family's future brighter, I can only dream of impacting someone's life as you have mine."

SEAD H.
2022

Biomanufacturing Technician Apprentice

High School through Adult 2021

CAREER AWARENESS

Career Awareness programs inspire diverse high school, college, and adult learners to explore life sciences careers. These experiential events in and outside of the classroom expose students to the wide array of opportunities in the industry by connecting them to professionals from academia and the life sciences industry.

- **2,293 students** representing 37 schools participated in career awareness programming, **80%** of which reported an **increased interest in pursuing sciences at a college or career level.**
- **392 job seekers and 40 employer companies** convened at a Career Fair hosted in partnership with MassBio.

APPRENTICESHIPS

The Life Sciences Apprenticeship Program, which was launched in 2021, provides accelerated training for individuals new to the industry to gain foundational knowledge and acquire industry-recognized skills.

- **30 apprentices** enrolled in the program with **97% transitioning to on-the-job training.**
 - 19 Biomanufacturing Technician apprentices
 - 11 Clinical Trial Associate apprentices
- **60%** were female.
- **63%** were People of Color.
- **17** Industry professionals have become mentors to our 2021 apprentices.

Apprenticeship Program Highlights

- The Program launched in spring of 2021.
- As part of National Apprenticeship Week, MassBioEd was honored to receive a proclamation from the State of Massachusetts.
- 97% of Apprentices transitioned to work and saw a 158% increase in wages.



“Rarely do you get the time and space to think about these techniques in meaningful ways and be focused and purposeful in working to attain them.

Leading in a Hybrid Environment has allowed me this focus.

The course really helped change my approach to my direct reports in order to adjust to being in a hybrid work environment and to better evaluate what their needs and issues are, which may be different now.”

NOVEMBER 2021 LEADING IN A HYBRID ENVIRONMENT PARTICIPANT

Life Science Professionals

2021

PROFESSIONAL TRAINING COURSES

Our continued learning program offers a wide range of professional development courses that allow professionals to deepen their expertise and skills through intensive workshops and trainings. Offerings focus on project management, presentation and leadership skills, the business and science of biotech, and more.

- **567 enrollments** across all trainings, including the 5 new technical and soft skills courses.

LIFE SCIENCES WORKFORCE CONFERENCE

The Conference focuses on meeting hiring needs and exploring how industry, government, and academia can work together to build the best life sciences workforce in the years ahead.

- **333 individuals** convened to discuss challenges and opportunities within the industry and academia.

2021 MASSACHUSETTS LIFE SCIENCES EMPLOYMENT OUTLOOK

MassBioEd analyzes employment statistics and hiring demand in the life sciences for the purpose of forecasting job trends, identifying skills required for in-demand jobs, highlighting best practices in education and training programs, and serving as an effective guide on the talent and workforce needs for the industry.

- **377 individuals** accessed the resource, **100% of which respondents said the information was useful to their work.**

CAREER AMBASSADORS

MassBioEd’s volunteer programs build a critical bridge between classroom and careers. Volunteers from all areas of the life sciences industry share their experiences and enthusiasm with students considering a career in the life sciences, and adults contemplating a career change or advancement.

- **92 industry professionals volunteered** to provide career awareness engagements to students.

2021 Partners

Education Partners

Association of Clinical
Research Professionals

BioRad

Fitchburg State University

LabCentral

LabExchange

MiniPCR

miniONE

New England Biolabs

Northeastern University

Tufts Center for Science Education

Westfield State University

Biomanufacturing Technician Apprentice Employers

Bristol Myers Squibb

Arranta Bio

Pfizer

Alnylam Pharmaceuticals

MassBiologics



Clinical Trial Associate Apprentice Employer

Apellis Pharmaceuticals

Replimune

Magenta Therapeutics

Covis Pharma

Blueprint Medicines

Halloran Consulting Group

Praxis Precision Medicines

Agios Pharmaceuticals

Jounce Therapeutics

Surface Oncology

Glimpse of Our 2021 ACCESS Program Graduates: Jourbienthia Paul

Jourbienthia Paul picked up her first micropipette sophomore year at Match High School when Whitney Hagins, BioTeach Instructor, came into her classroom to guide students through a photosynthesis lab activity. After multiple visits, Jourbienthia was excited to be able to do the hands-on learning she had read about throughout her education. That same summer, Whitney encouraged her to apply to the LEAH Knox Scholars Program at MIT which provides lab training to students and matches them with internships. She was accepted into the program.

Jourbienthia earned a scholarship from her high school that helped her attend Smith College, where she studies Biochemistry. Epigenetics intrigues her the most and seeing how environmental factors can determine what genes get expressed. Specifically, she is interested in how HIV can be used as a tool to edit genes, since the virus embeds its genome into ours. She is currently part of the Achieving Excellence in Mathematics, Engineering and Sciences (AEMES) Scholars at Smith College, which gives first-generation freshmen and sophomores the opportunity to work with a professor on their research.

"I was always interested in science for as long as I can remember. It began with space, specifically," she said.

When Jourbienthia first came to the U.S. from Haiti, she was six years old. The first book she received after arriving in America was about outer space. Though she couldn't read in English yet, the images sparked her curiosity.

During the LEAH Knox Program, she realized she didn't have as much lab experience as other students. "It made me a bit sad that we had not done as many hands-on labs at Match." The limited lab exposure Jourbienthia did have at Match High School was supported by MassBioEd's ACCESS program. Jourbienthia credits ACCESS instructor, Whitney Hagins, for introducing her to opportunities in the life sciences.



"Whitney gave me lab experience and encouraged me to apply to the LEAH program."

As a LEAH Scholar, Jourbienthia was nervous to speak with the summer professors because she had so little lab experience. However, she felt comfortable with the Teaching Assistants and could explain to them when she wasn't familiar with something.

So, when Whitney asked her to return to the 2022 Student Summer Training Program, this time as a Teaching Assistant for a joint MassBioEd, LEAH Knox, and Lab Central initiative, she saw it as an opportunity to make a difference for others now in that same position. "My goal is to make the students feel comfortable enough to ask questions and share when they don't know something."



Jourbienthia is looking forward to her next few years in college, doing more internships and research. Next summer, she is hoping to focus on research. She will apply to the Summer Undergraduate Research Fellowships (SURF) Program at Smith College which would allow her to do research under Professor's supervision and gain more lab experience.

“Younger me would love to hear from myself now to not restrict yourself and be open minded.” Jourbienthia said.

She is contemplating pursuing her PhD after earning her Bachelor of Science in Biochemistry.

The continuation and expansion of the Student Summer Training Program, piloted in 2022, will help other students from ACCESS schools gain in-lab and internship experience before college. As MassBioEd's ACCESS Program grows, and we work with more teachers and students in high-need districts, we aim to inspire students to pursue science and bring diversity of thought into colleges, universities and the industry across different career tracks.

ACCESS Program Highlights

- ACCESS is a district-wide, intensive three-year program focused on underserved schools.
- Partner districts receive vertically-aligned, hands-on life science lab lessons and career experiences for students in grades 6-10.
- Teachers are provided training, equipment, and in-school mentoring to implement lessons and career awareness into existing curriculum.

MassBioEd celebrated 20 years of building a life sciences workforce in 2021. The Celebration took place at the Annual Champions for Biotechnology Education Awards Reception and highlighted the evolution and impact of MassBioEd's programs over 20 years, looking to the next 20 years of continued success in opening career doors to underserved students and building a strong and diverse workforce.

Champion for Biotechnology Education Awards



CHAMPION FOR BIOTECHNOLOGY EDUCATION ORGANIZATION AWARD

Bristol Myers Squibb



JOSHUA BOGER INNOVATIVE SCHOOL OF THE YEAR AWARD

Everett High School



HENRI A. TERMEER EDUCATOR AWARD

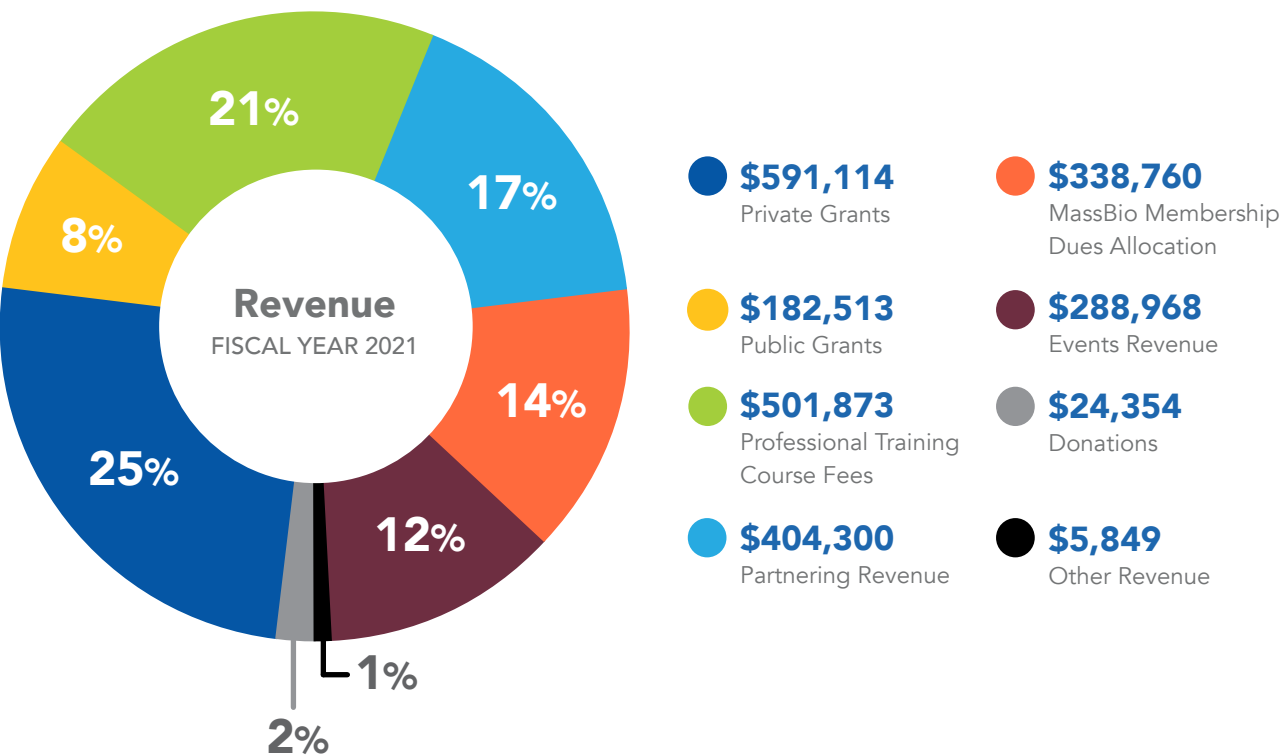
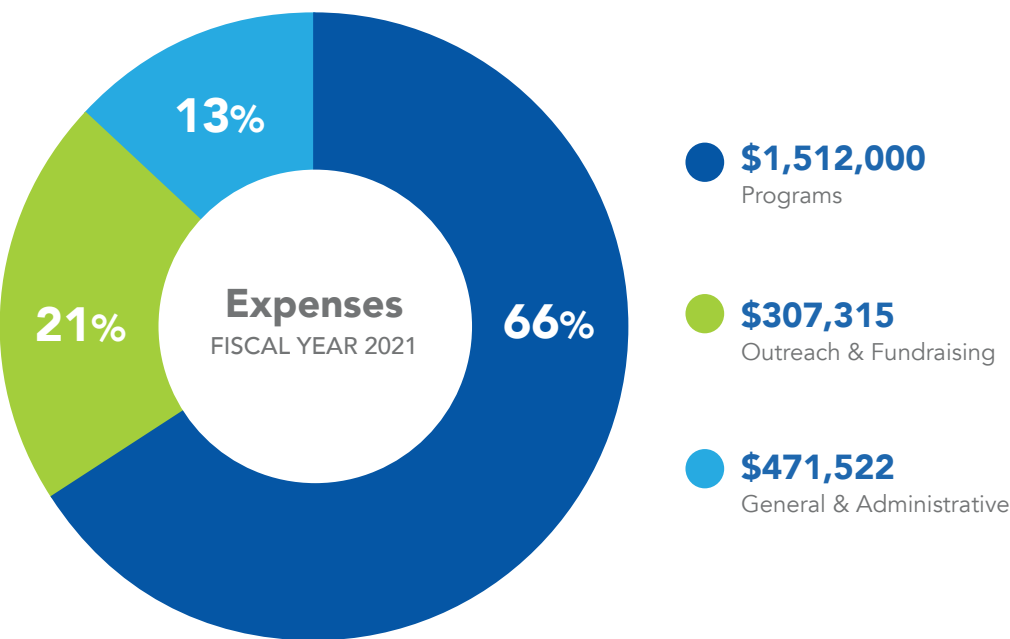
Stacey Chapley, Science Teacher
Frontier Regional High School



HENRI A. TERMEER STUDENT SCHOLARSHIP AWARD

Rim Bozo, Pioneer Charter School of
Science & Dartmouth College

Massachusetts Biotechnology Education Foundation



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“In high school I was able to enroll in a Biotechnology program and it changed my life.

I was able to determine that this was the career that I wanted, and I’ve been doing it ever since! Biotechnology is an extremely fun and rewarding field, and I am happy to be able to contribute!”

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