



PLANTING THE SEEDS: MEETING BIOTECHNOLOGY WORKFORCE DEVELOPMENT NEEDS IN MASSACHUSETTS

Biotechnology companies continue to report the Massachusetts' life science sector's greatest strength is the current workforce. But employers also express concern with academia's ability to continue to provide enough talent to match the industry's growth. Recent MCAS results and declining interest in Science, Technology, Education, and Math (STEM) majors among prospective Massachusetts college students set an alarming trend. Without significant intervention, Massachusetts faces the risk of not meeting corporate workforce needs due to lack of student interest and knowledge.

According to *Growing Talent*, a workforce report commissioned by the Massachusetts Biotechnology Council and the Massachusetts Life Sciences Center, Massachusetts needs to increase the pipeline of residents entering both higher education degree programs and careers in the life sciences. To accomplish this goal, the report makes five key recommendations:

1. Produce and retain more graduate students with interdisciplinary training in the sciences, mathematics, business, and legal and regulatory affairs.
2. Strengthen the interdisciplinary curriculum and experiential learning programs in undergraduate education.
3. Improve and target technical training to existing and emerging employer needs.
4. Expand the pipeline of K-12 students motivated and prepared to enter higher education and careers in STEM fields.
5. Improve communication and coordination between the life sciences industry and higher education.

The Massachusetts Biotechnology Education Foundation (MassBioEd) is working to bring together representatives from academia and the biotechnology industry to act on the *Growing Talent* recommendations and bridge existing gaps in the workforce pipeline.

A United Response

Eight years ago, the Massachusetts Biotechnology Council (MBC) recognized that Massachusetts' biotechnology sectors success would depend on the quality and capacity of the workforce. Leaders foresaw growth of the industry required a strong and vibrant science educational pipeline. To address this issue, the MBC established MassBioEd to "create engaging biotechnology educational opportunities in schools, the workplace and the community at large."

"In these economic conditions, and with the developing capacity of other states and countries, it is essential that Massachusetts improve its ability to educate, hire, and retain biotechnology workers," said Lance Hartford, MassBioEd's Executive Director.

Since MassBioEd was founded in 2001, the MBC has been a steadfast partner in developing linkages between the industry and educational institutions. These linkages between education and biotechnology companies are essential to filling and maintaining the workforce pipeline.

In order to attract students of all ages to opportunities in the biotechnology industry, students and teachers need to understand how classroom science provides the foundation for "real life" biotechnology companies to respond to unmet medical needs.

MassBioEd Initiatives

Massachusetts Life Sciences Education Consortium (MLSEC)

The new MLSEC will provide a permanent vehicle by which the biotechnology industry, educators, and trainers will address curriculum development, retraining program design, co-ops and internships, and other areas of concern. The consortium will advocate and assist in the development of the premier life sciences workforce through a commitment between the life sciences industry and higher education.

MLSEC Purposes:

- Actively engage industry and academic leaders in ongoing dialogue, responsive planning, and feedback to meet Massachusetts' life sciences current and long-term workforce needs
- Advocate for the integration and alignment of academic curricula
- Advocate and facilitate integration of experiential learning through internships and co-ops
- Coordinate and systematize industry input for higher education curriculum design
- Anticipate and develop strategies to meet incumbent worker training needs
- Ensure Massachusetts workers are prepared for emerging life sciences industry positions
- Facilitate and coordinate communication between stakeholders

Potential Outcomes:

- Create specific career development pathways and support strategies
- Develop an education strategy that stakeholders understand and support
- Develop stakeholder-supported curricula for vocational certificates and community college, Bachelor's and Master's degrees
- Provide incumbent worker training resources
- Maximize experiential learning through corporate internships and co-ops

BioTeach

MassBioEd runs BioTeach, an ambitious teacher professional development program designed to support biotechnology instruction and career awareness activities.

Over a six-year period, BioTeach plans to provide professional training for educators in all Massachusetts high schools, so they can access and use biotechnology curricula, expose students and teachers to career awareness activities in the life sciences, partner with schools, government, and local businesses to support scientific curiosity, increase student participation in science, and train some for a career in the life sciences.

For schools receiving the initial BioTeach grant MassBioEd provides:

- Up to \$8,800 in biotechnology laboratory equipment/supplies and consumables in year one, with re-supply of some materials in year 2 and 3.
- A summer professional development workshop with stipends and Teacher Professional Development Points (PDP) certification upon completion
- A winter teacher professional development workshop with stipend and PDP certification
- Visit from the MobileLab for teacher and student lab experience facilitated by BioTeach mentor



Dedham High School students participate in an experiment on board the Mobile Lab.

To date, teacher professional development training and equipment has been provided to 162 public high schools. Almost \$2 million in equipment supplies and consumables has been awarded, and more than 475 science teachers have received biotechnology laboratory training. MassBioEd is anticipating reduced funding from the state in 2009, which will require the scope of the BioTeach program to be scaled back. With the Foundation's current funding, we expect to add 10 to 15 new schools and continue supporting at least 172 schools.

Life Science Career Development (LSCD) Program

In addition to the BioTeach grant program, the LSCD Program supports the development of academic, personal, and employability skills for students pursuing careers in the life sciences at the post-secondary level. This competitive grant is available to schools that have received the BioTeach grant. The LSCD Program works to institutionalize a sustainable, collaborative leadership model involving guidance, administration, and science teachers working together to create this learning environment.

LSCD Program Goals:

- Develop awareness and excitement about life science careers among students, teachers, administrators, and guidance staff
- Build teams of teachers, guidance staff, and educators that work with life science business and higher education partners
- Develop co-curricular and informal learning models to enhance students' classroom experiences



Bellingham High School students participate in a MassBioEd job shadow day at EMD Serono, Inc. facilities in Rockland, MA.

The Education and Workforce Development Resource Center

The MassBioEd website supports science and biotechnology education in Massachusetts by providing an online resource center for educators, students, educational institutions, and biotechnology companies.

The MassBioEd Resource Center is designed to develop and support online strategic partnerships among high schools, colleges, and universities and the biotechnology industry. By identifying and sharing resources, today's leaders in academia and the field can help create a biotechnology-literate populace, prepare the industry workforce, and develop the industry leaders of tomorrow.

- Educators can learn more about BioTeach grants, search professional development programs, review biotechnology curriculum, search for externship or internship programs, schedule a company or college site visit, or request a classroom.
- Educational institutions can post information about their professional development and college biotechnology programs.
- Students can view MassBioEd's learning resources, search for jobs and internships, explore careers in biotechnology, and learn about biotechnology college programs in Massachusetts.
- Biotechnology companies can coordinate school site visits and speaker opportunities, which educate, encourage, and build enthusiasm for the biotechnology workforce of tomorrow; offer teachers externship opportunities and provide workplace experiences they can take back to the classroom; offer students internships and expose them to workforce behavior and expectations, while teaching them about the skills and education needed to pursue a career in biotechnology.

The Resource Center gets more than 300 hits per day and has had more than 78,000 visitors since its inception a year ago. Through the Resource Center, the following have been coordinated:

- 26 school speaker bureau requests touching 900 students
- 12 career panel presentations reaching 350 high school and college students
- Job shadowing experiences for 150 students
- 14 school/company tours including 560 students



The Leadership Training Program for Scientists helps scientists develop management skills.

The Learning Center

MassBioEd offers courses, seminars, and in-depth training for biotechnology professionals and the adult public. All courses are taught by industry professionals—ensuring that the workforce pipeline is perpetually sustained.

Current Courses:

- Biotechnology Project Management
- An Overview of Clinical Research
- Leadership Training Program for Scientists
- Current Good Manufacturing Practices (cGMP) Training
- Improving Biotech Presentation Skills

Other Initiatives

Cancer Challenge

Working with the American Cancer Society (ACS), the MBC issued an unprecedented \$1.4 million cancer research challenge to life science companies to fund the region's most promising postdoctoral fellowships. The goal of the challenge is to fund 12 three-year ACS postdoctoral fellowships worth \$140,000 each. MBC members AstraZeneca Pharmaceuticals, Novartis Institutes for BioMedical Research, and EMD Serono, Inc. generously stepped forward with the lead commitments to each fund a three-year ACS fellowship.

Life Sciences Internship Challenge

The Massachusetts Life Sciences Center (MLSC) is offering a special Internship Challenge program during the summer of 2009. The program aims to connect Massachusetts students majoring in the STEM fields with life sciences companies and research institutions across the Commonwealth, to expand the pool of prospective employees who have practical experience, and to enhance opportunities for mentoring, enable more students to explore career opportunities despite the challenging economic environment. At least 100 students who are selected for the Internship Challenge will receive a stipend of \$4,800 for eight weeks of work, and host companies or institutions will commit to providing a dedicated mentor and meaningful internship opportunity that ties to the student's academic focus, along with matching funds where feasible.



Representatives from the MBC, ACS, and the Cancer Challenge gather at the Cancer Challenge Symposium in February 2009.

We need your help

As a single individual or company, it's often a challenge to decide what your role can be in developing the biotechnology workforce pipeline in Massachusetts. However, fostering interest in the industry among prospective biotechnology leaders can be as easy as participating in:

- MassBioEd's job shadow program with local high school BioTeach students and teachers
- MassBioEd's speaker bureau program
- MassBioEd's teacher externship program
- MassBioEd's corporate sponsorship campaign
- The MBC/MassBioEd golf tournament (September 11, 2009)

For more information or to get involved, contact MassBioEd Foundation Executive Director Lance Hartford at 617-674-5100 or lance.hartford@massbio.org.

Help Build our 2009 Donor Triangle!

