



Online Learning

BIAGEN-MIT BIOTECH IN ACTION PROGRAM

In 2020, the COVID-19 pandemic brought about a seismic shift in the landscape of education worldwide. Traditional methods of educating students, deeply rooted in physical classrooms and face-to-face interactions were no longer an option. There was no playbook for school systems to follow, and no one would have ever predicted that plans of this nature would have to be created. Biogen Inc., an American multinational biotechnology company, had been offering successful in-person laboratory experiences for high school students through their two Community Labs located in Cambridge, Massachusetts, headquarters and at their facility in Raleigh, North Carolina. Amid the great deal of uncertainty in education and knowing that in-person programming would be halted for the foreseeable future, Biogen reached out to the Lemelson-MIT Program (LMIT), a national leader in the U.S. for its work with inventive K-12 students, to partner with them and take their Summer 2020 program online.

Development was rapid with only three months to source a learning management system, create content, test new technologies, hire instructors for online delivery, and transition students to virtual learning. Biogen Community Labs and LMIT successfully launched Biogen-MIT Biotech in Action

program, a state-of-the-art, fully online synchronous learning experience for high school students. The program was offered at no cost to students and provided first-hand experience in biotechnology and the opportunity to learn directly from, and be mentored by, leading scientists and inventors from Biogen, MIT, and their combined ecosystems. The program utilized Labster, an immersive interactive learning environment with virtual science simulations. Labster was used to facilitate critical, qualitative, and experiential thinking, and to contextualize common biotechnology principles. The program in its entirety was delivered via Canvas, a web-based learning management system.

Biotech in Action served 400 students over five sessions during that first summer with a focus on Parkinson's Disease. Most of the students were from low-income households and groups historically underrepresented in science, technology, engineering and math (STEM). Student Recruiting efforts were led by Biogen, while technological support and facilitation of the program was administered by LMIT. The two-week sessions led students working in small teams with an instructor to produce and present a research poster as a culminating event. Throughout the program,

guest speakers were brought in via Zoom to discuss relevant topics, and smaller group interactions called “water cooler talks” occurred with Biogen employees, MIT faculty, staff, students, and young inventors from LMIT’s initiatives.

Because of the program’s extraordinary success and the continuation Covid, subsequent offerings were planned for the following spring. In 2021, after a global expansion of recruiting, 19 countries were represented among the students enrolled. At the program’s peak, 24 countries were represented in addition to the United States. Biotech in Action continued to be a strong and engaging virtual program during summers. There were also fall programming on Saturdays. In total, 18 sessions across four years were offered. The program underwent a series of deliberate transformations, a testament to the dynamic nature of Biotech in Action. In an ongoing effort to infuse vitality and relevance, the program’s content was thoughtfully modified on multiple occasions covering Parkinson’s Disease, Alzheimer’s Disease, and Multiple Sclerosis (MS). This attested to the capacity of the educators who developed and administered the program and their commitment to keeping the experience fresh and engaging.

“Biogen-MIT Biotech in Action exemplified the potential of digital education when equally strong partners join forces with their unique competencies. Learners were engaged from across the globe while exploring the interconnectedness of scientific discovery and technological invention,” says Dr. Leigh Estabrooks, LMIT’s Invention Education Officer, who was instrumental in the creation and execution of the program.

Inclusive educational programming stands as the cornerstone of a society committed to equity and belonging. It is a transformative force that dismantles barriers, embraces differences, and cultivates a rich tapestry of learning experiences. In the inclusive classroom, every student is not only welcomed but celebrated for their unique strengths, perspectives, and contributions. Through innovative online platforms, collaborative virtual spaces, and accessible resources, the Biotech in Action program transcends geographical boundaries, creating a community where individuals, regardless of their location, can engage in a shared pursuit of knowledge, understanding, and growth.

ABOUT BIOTECH IN ACTION

The Lemelson-MIT Program partners with biotechnology organizations through Biotech in Action to create online programs for students in grades 9-12 that foster a passion for science and invention, especially in students underrepresented in STEM. Programs customized to meet the organization’s goals can be offered during the summer months, across the regular school year, or both. Students complete various activities, such as virtual lab simulations using online software, preparing research posters, and considering invention to improve the lives of others, while working in teams.

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*Leigh Estabrooks,
Invention Education Officer, LMIT*

ABOUT LEMELSON-MIT

The Lemelson-MIT program has become a national leader in efforts to prepare the next generation of inventors and entrepreneurs. Our work focuses on the expansion of opportunities for young people to learn ways inventors find and solve problems that matter. We are devoted to bringing invention education opportunities to all students, while prioritizing work with young women and Black, indigenous populations, Latinx and other people of color. LMIT is funded by The Lemelson Foundation and administered by MIT’s School of Engineering.

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