

Biotech Discovery Labs - Outcomes Report

During the four days of instruction for ASGCT's Biotech Discovery Labs (BDL) program, teachers participated in laboratory experiments that focused on elements of cell and gene therapy from simple DNA extraction to CRISPR. Teachers learned proper use of lab materials, effective lesson planning to scaffold student learning, how to provide real life application regarding specific diseases, and the ethical implications of CGT for students, all through hands-on, engaging lessons. Teachers also participated in ethics discussions, listened to experts in the cell and gene therapy field, and learned how to use 3D DNA models with students. The activities and labs were hands-on, teacher-led experiences through the process of setup, execution, and analysis.

Teachers learned from the following activities:

- DNA extraction with strawberries
- DNA transformation lab
- PCR genetics lab
- PCR sickle cell lab
- CRISPR lab
- Gel electrophoresis: Wrongful conviction lab

Objectives

Currently, over 500 students are part of or have been a part of a classroom utilizing the program's labs and training. ASGCT aims to reach more than 1,000 MPS and/or MPS charter students through BDL by June 2025. These students will be exposed to labs that will build on their scientific understanding and learn skills that will propel them forward in any biotech or scientific studies in the future. These labs will strengthen their grasp of the basics of gene and cell therapy and other biotech topics to ensure that they are prepared for a future in the sciences, should they choose to pursue that route.

- 20 teachers have participated in the program training (Four in 2022, 16 in 2023)
- 12 MPS high schools were represented in 2022 and 2023
- 70% of participating teachers identified as female and 30% identified as male
- 59% of participating teachers and 85% of participating students identified as coming from an underrepresented background

Educator Feedback

- Did the Biotech Discovery Labs teacher training meet your expectations? Avg. 9 / 10
- How likely are you to use the information from Biotech Discovery Labs teacher training in your classroom with students? (1 very unlikely – 10 highly likely) Avg. 9.5 / 10
- Did the Biotech Discovery Labs teacher training increase your knowledge of gene and cell therapies? Avg. 8.93 / 10

"It was incredibly well-designed by teachers and for teachers. I appreciated that it was hands-on so we could experience and make more memorable the activities. The activities covered a wide-spectrum of levels of complexity and I will be able to use them in my 9th grade biology classes as well as the more advanced IB Biology classes. I deeply appreciate that ASGCT is specifically targeting Milwaukee Public Schools for this outreach. This is the best professional development I've ever done."

"Literally seeing other MPS science teachers was huge. So much is just zoom meetings now post pandemic and there was something special and "normal" about getting to work with people in a similarish situation as me...I have had other trainings that have felt moot because the presenters were not geared towards MPS, but rather other districts with different sorts of challenges, but never once got that sense all week which was awesome. I also liked the practice with each lab we did because it was not only hands on, but also offered TIME to work with the ideas and practice with the supplies which is so hard to come by when prepping for a new lab or activity for students. That part was really invaluable."

"I found the lab practice and skills reviews to be extremely useful. I also really enjoyed collaborating with other teachers and learning from them / leaning on their specific skills."