

Teacher Externship Program – Bridging the Gap between Secondary Education and Biotechnology/STEM(+M) Careers

Other

Shixia Huang (shixiah@bcm.edu), Baylor College of Medicine, **Katherine Harris**, Baylor College of Medicine, **Beatriz Perez-Sweeney**, Baylor College of Medicine, **Bernice Shargey**, Baylor College of Medicine, **Katie Holtman**, Baylor College of Medicine

Background: Teachers are the most influential determinants of a student's success in life. In STEMM (Science Technology Engineering, Mathematics and Medicine), teachers foster students' problem solving and critical-thinking skills, and ultimately have the power to unlock students' passions and mentor the next generation of scientific leaders. While working with middle and high school teachers, we observed that most science teachers' scientific experiences were limited to the courses of their undergraduate education. Without opportunities for advanced scientific training and hands-on experience themselves, it is incredibly challenging for these teachers to be expected to provide real-world scientific experiences to adequately prepare students for futures in STEMM.

Objectives: We started a Teacher Externship last summer, pairing teachers with scientists and exposing them to cutting-edge biotechnology and research approaches, coupled with collaboration to determine how best to use the new knowledge to teach their students.

Methods: Over the course of 2 days, the teachers heard from scientist speakers and met with their scientist mentors to learn about their research and technology, share about their curriculum, and collaborate with their mentors. These teachers represent diverse content areas in middle and high school. Teachers were provided surveys gauging their attitudes towards integrating current science topics in their curriculum before and after participation in, as well as opinions on the program itself.

Results: For this pilot program, the teachers came from two schools in the Houston Independent School District. Preliminary survey results show that most teachers gained both confidence and knowledge regarding integrating STEMM concepts in their classrooms, and most plan on continuing the partnership with their scientist mentor beyond this summer.

Conclusions: Nearly all teachers started a lesson or lesson component based on their work with their scientist mentor. These lessons were carried out during the 2021-2022 school year.

Further Directions: Encouraged by the success, we planned a program for next summer: Baylor College of Medicine Biotechnology Research Incubator for TEachers (BCM-BRITE), to bring teachers to BCM for biotechnology immersion program). This intensive two-week program will be centered around hands-on technology-research coupled with a side-by-side mentored experience with scientists in the laboratory. While working alongside scientists, teachers will also work to develop a lesson for their classroom. Beyond the immersion program, teachers will receive continued collaboration throughout the school year to integrate their learning. Furthermore, we will also work with the teachers to ensure the lesson plan meets the content quality and format requirements for publication on BCM's education resource BioEd Online (<https://www.bioedonline.org/>) and benefit teachers in Texas, across the US, and the world. In the meantime, we aim to develop BCM-BRITE into a National Science Foundation grant application, to annually support Biotechnology training for teachers in Houston and other parts of the country.