Baylor College of Medicine Biotechnology Research Incubator for Teachers

BCM-BRITE Workshop
July 1st – 15th, 2022

Program Director

Shixia Huang PhD, shixiah@bcm.edu

Department of Education, Innovation & Technology

Advanced Technology Cores

Baylor College of Medicine
Biotechnology Research Incubator for Teachers (BCM-BRITE)

Teachers foster critical-thinking and problem-based solving skills and ultimately have the power to unlock the student's passions for science and innovation in Science Technology Engineering, Mathematics, and Medicine (STEMM) education. In order to empower teachers to educate the next-generation thinkers and problem solvers in secondary school, we established the BCM-BRITE program to train science teachers in foundational scientific research approaches. In this program, the teachers are exposed to authentic, cutting-edge biotechnologies and mentored by research scientists and STEMM specialists to translate their workshop experiences into direct collaborative, problem-based learning classroom experiences for their students.

Program Director
Shixia Huang, PhD
Phone: 713-798-8722
Email: shixiah@bcm.edu

Co-directors:
Katherine Harris, BS
Fred A Pereira, PhD

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Scientists and STEMM specialists and their centers/departments

BCM-BRITE 2022 Workshop Outline

Module 1: Biotechnology and Research Seminars and Discussions

Session 1. Program Overview and Advanced Technology Cores at BCM by Shixia Huang
Session 2. Cancer biology and genomics & proteomics by Fred Pereira
Session 3. Breast cancer & targeted therapy by Rachel Schiff
Session 4. Proteomics technology and cancer research by Shixia Huang
Session 5. Recombinant protein expression for protein function study by Yingmin Zhu
Session 6. Neuroscience and Brain Cancer: PIK3CA Variants Selectively Initiate Brain Hyperactivity during Gliomagenesis by Kwanha Yu
Session 7. Big Data and Multiomic Analysis by Cristian Coarfa

Module 2: **Experimental Approaches and Laboratory Procedures – Hands-on Experiences**

Provided by Antibody-based Proteomics (ABP) Core **(https://www.bcm.edu/research/atc-core-labs/antibody-based-proteomics-core)**
& Protein and Monoclonal Antibody Production (PMAP) Core
(https://www.bcm.edu/research/atc-core-labs/protein-and-monoclonal-antibody-production-core)

Session 1. Project Design, Experimental Controls, & Note Taking by Jimmie Thomas
Session 2. Research Project Design and Overview by Shixia Huang (ABP Core)
Session 3. Cells & Cell Culture by Kurt Christensen (PMAP Core), and Zhongcheng Shi & Xuan Wang (ABP Core)
Session 4. Tissue Lysate Protein Extraction & Protein Quantification by Zhongcheng Shi & Xuan Wang (ABP Core)
Session 5. Western Blot Analyses by Xuan Wang & Zhongcheng Shi (ABP Core)
Session 6. Reverse Phase Protein Array (RPPA) by Xuan Wang & Zhongcheng Shi (ABP Core)
Session 7. RPPA Image Analyses & and Data Analyses by Zhongcheng Shi & Xuan Wang (ABP Core)
Session 8. Recombinant Protein Expression in E. coli by Honglei Zhai & Yingmin Zhu (PMAP Core)
Session 9. Recombinant Protein Purification by Honglei Zhai & Yingmin Zhu (PMAP Core)
Session 10. Hands-on Training on Data Analyses and Public Data Mining by Zhongcheng Shi & Xuan Wang

Module 3: Literatures, Lesson Plans, and Presentations

Session 1. Reading Scientific Literature & Thinking like a Scientist by Fred Pereira
Session 2. Breast Cancer Experiences and Treatment Options by Titilola Adio
Session 3. STEMM Lesson Plans by Katherine Harris
Session 4. BioEd Online Platform by Katherine Harris & Dolores "Lollie" Garay
Session 5. Final Presentation – Showcase Teachers' Lesson Plans

BCM-BRITE 2022 Instructors, Scientist Mentors, & STEMM Specialists

Shixia Huang, PhD
Katherine Harris, BS
Fred Pereira PhD
Rachel Schiff, PhD
Cristian Coarfa, PhD
Yingmin Zhu, PhD
Zhongcheng Shi, PhD
Xuan Wang, PhD
Honglei Zhai, PhD
Jimmie Thomas, EdM
Kwanha Yu, PhD
Dolores "Lollie" Garay, MST
Kurt Christensen, BA
Titilola Adio, MD