

Summer Research Training at the Biomedical Research Center

Date: 6th – 27th June 2021

Program Introduction:

BRC 2021 online summer internship program will cover various essential research techniques and tools and will assess participants' understanding of practical applications of these techniques;

1. An introductory lecture by the principle investigator, in which presented video clips explaining the technical side of laboratory work will be presented
2. Students review of research papers covering the technical aspect under discussion. To complete this stage, groups of three students will be formed to discuss the different papers with the principal investigator
3. Presentation and discussion of research papers by different groups of students, followed by discussion and evaluation by the principle investigator

Topics:

- Introduction to Biomedical Research.
- Microbiology.
- Cell culture.
- Genomics.
- Chick embryo.
- Zebrafish embryo.

Program period: 3 weeks (6th to 27th June 2020)

Targeted Participants:

Graduates & Undergraduates students from colleges of (Health cluster, Engineering, CAS)

Acceptance:

Only 20 students will be accepted & shall receive the acceptance email two days prior to the training starting date.

Program Details:

	Time	Course	Topics
Week-1	8:00 AM - 10:00 AM	Introduction to Biomedical Research.	Introduction to Biomedical Research. In vitro - In vivo experimentation. Ethical Issues in Biomedical Research. Lab Safety Measures, Types of PPE, Sample handling. Waste Management, Fire and safety, Daily cleaning maintenance.
	2:00 PM - 4:00 PM	Genomics	Sampling. Extraction. PCR and RT-PCR. Analysis. Reporting.
Week-2	8:00 AM - 10:00 AM	Microbiology	Preparation of bacterial growth media. Sampling and streaking of bacteria from clinical source and surrounding environment. Culturing bacteria into an agar plates. Identification of bacteria: Gram staining, biochemical, molecular and automated. Antibiotic sensitivity testing.
	2:00 PM - 4:00 PM	Cell Culture	Apply basic aseptic techniques for cell culture. Counting and seeding. Passaging. Evaluate the viability of the cultured cells. Use brightfield and fluorescent microscope.
Week-3	8:00 AM - 10:00 AM	Chick Embryo	Understand the importance of chick embryo as a model in studying metabolic disorders such as heart disease and diabetes. Recognize the major developmental steps in chick embryo focusing on cardiovascular system, and resemblances to human. Doppler echocardiography technique to evaluate cardiac physiology. Perform chick embryo heart isolating techniques. Histology and RT-PCR with chick embryo hearts.
	2:00 PM - 4:00 PM	Zebrafish embryo	Understand the importance of zebrafish model for toxicology research and for studying human genetics syndromes. Learn basic steps of breeding adult fish to generate embryos for experimentation. Learn the details of maintaining a zebrafish facility. Recognize the major developmental steps in zebrafish embryo focusing on cardiovascular system. Designing and injecting morpholino to manipulate gene function in zebrafish Toxicology and motility assays for zebrafish using microscopy. RT-PCR with zebrafish.