# BASIC TRAINING ON UTILIZATION OF ZEBRAFISH AS AN ANIMAL MODEL

This basic training program covers the use of zebrafish (*Danio rerio*) as an animal model in biomedical research. It comprises mixed theoretical and practical sessions for essential aspects of zebrafish research. The course is obligatory for all students and researchers who intend to experiment with zebrafish at Qatar University Zebrafish Facility under the Biomedical Research Center (BRC), regardless of previous training they may have had at other organizations. Our responsibility is to guide researchers and students in training and certification in using zebrafish at BRC in a humane and responsible manner. This training program will give the trainees a general understanding of the regulations and responsibilities in using zebrafish for a variety of research purposes. The successful participants will be awarded course completion certificates. A copy of the certificate should be submitted with relevant research protocols for QU-IACUC approval before starting zebrafish projects.

Date and time: **January 18th – 22nd 2026**

**Sessions:** For each session, there will be a theoretical lecture followed by interactive demonstrations for the participants. The techniques demonstrated in this course will be at a basic level. Passing the course will not indicate full competency; therefore, additional practice will be required to ensure that the individual is confident before applying the techniques. There is a total of 6 sessions in this workshop:

**Session 1: Introduction to Zebrafish as an Animal Model in Biomedical Research**
January 18th 2026 - 1:00 PM – 1:45 PM

This lecture will introduce the participants to the basics of zebrafish experimentation and relevant procedures at BRC. Topics will include:

- Overview of BRC research activities.
- Biosafety practices and ethical procedures at BRC.
- Zebrafish as an emerging animal model in research; advantages and limitations of zebrafish, overview of different techniques and research areas for zebrafish.

Dr. Fusun D. Balli, the Zebrafish Facility Manager at BRC, will deliver the lecture. It will last 45 min.

**Session 2: Gene Editing Techniques on Zebrafish in Disease Modeling**
January 18th 2026 - 1:45 PM – 2:30 PM

This lecture will introduce the participants to the most commonly used techniques on zebrafish in disease modelling, with example applications. These include CRISPR/CAS9 mutant line generation, morpholino knockdown approach and other gene editing technologies

The lecture will be delivered by Dr. Fusun D. Balli, the Zebrafish Facility Manager at BRC. It will last for 45 minutes.

Question & Answer and Break: 2:30 PM – 3:00 PM

**Session 3: Working with Zebrafish Requirements and Procedures**
January 18th 2026 - 3:00 PM – 4:30 PM

This lecture will guide participants through conducting adult zebrafish experiments, with a focus on ethical and regulatory standards. We will start with the application process, outlining the steps for approval from

the IACUC, in accordance with the Ministry of Public Health (MoPH), and the necessary documentation. The talk will cover guidelines from the Biomedical Research Center (BRC) on humane care, including housing, care standards, and welfare protocols. Additionally, we are going to explain how to collaborate with the BRC, covering proposal submissions and accessing their facilities, while adapting protocols to align with facility capacities. This comprehensive overview ensures experiments are efficient, ethical, and compliant.

Trainees will observe experimental rooms (embryo and adult), specific adult requirements, and examples of adult protocols.

Zebrafish Facility Technologist Ms. Enas Al Absi will deliver the lecture. Duration is 1 hour and 30 minutes.

**Session 4: Zebrafish Husbandry Lecture and Demonstration**
January 19th 2026 - 1:00 PM – 3:30 PM

This lecture will introduce the participants how to maintain zebrafish lines using water circulation systems properly. Topics will include the basics of zebrafish maintenance, assessment and monitoring of water quality, feeding of zebrafish, and health monitoring of zebrafish.

In the demonstration part, the participants will see the main husbandry room, getting an overview of

- Operation of the water circulatory system, feeding, and breeding of the adult zebrafish,
- Water quality tests for the water circulatory system
- Breeding of adult zebrafish

Zebrafish Facility Technologist Ms. Enas Al Absi will deliver the lecture. Duration is 2 hours and 30 minutes.

**Session 5: Practical Session for Injection Techniques & Embryo Monitoring**
January 20th 2026 - 8:00 AM – 9:30 AM & 9:30 – 11:00 AM

The session will be given as hands-on practical training on injection techniques. The attendees will have the chance to learn about embryo stages and injection sites, injection methods, and work closely to inject zebrafish embryos, as well as assess their quality post-injection.

The lecture will be delivered by Dr. Fusun D. Balli, Ms. Enas Al Absi and Dr. Himanshu Lajpat, postdoctoral researcher at BRC. It will last for 3 hours.

- Injection practice of zebrafish embryos
- Collection, counting, sorting, cleaning, and monitoring of embryos (24 hr., 48 hr., 72 hpf).

**Session 6: Monitoring of Zebrafish Embryo techniques**
January 21st 2026 - 1:00 PM – 4:30 PM

This lecture will show the proper handling of zebrafish embryos and how to monitor their development. Topics will include assessment of developmental stages of the zebrafish embryo via microscopy; developmental assays for zebrafish, such as hatching rate, survival rate, tail flick; phenotypic assessment for deformities; high-speed video recording for heart function assessment; and locomotion monitoring for behavioral assessment. In the demonstration part, the participants will observe:

- How to image and video record unhatched embryos for tail flick analysis,
- How to image and video record hatched embryos for phenotypic assessment,
- How to image and record blood flow in major blood vessels for heart function assessment,
- How to record locomotion videos for behavioral assessment

Zebrafish Facility Technologists, Mr. Ahmed Elwan & Ms. Enas Al Absi will deliver the lecture. Duration is 3 hours and 30 minutes.

**Session 7: Experimental analysis for the recorded images and videos**
January 22nd 2026 - 1:00 PM – 4:00 PM

This demonstration will show the attendees how to analyze the data collected from the previous session. These include:

- Tail flick analysis using the Noldus software
- Heart function analysis using the Viewpoint ZebraLab software
- Behavioral analysis assessment using Viewpoint software

Zebrafish Facility Technologists, Mr. Ahmed Elwan & Ms. Enas Al Absi will deliver the lecture, which will last 3 hours.