RESEARCH INSTITUTE FOR FUNDAMENTAL SCIENCES
Computational Approaches in Life Sciences and Aquaculture
(TBAE CALSA'25)

This COST Action BIOAQUA (CA22160) training workshop will equip early-career and established researchers in aquaculture with a modern, integrated toolset spanning bioinformatics, machine learning, quantum-centric calculations, and molecular simulations. Participants will learn end-to-end pipelines for genome and transcriptome assembly, population and eDNA metagenomics, and microbiome analyses tailored to farmed species and their ecosystems, then translate these outputs into predictive models for health, breeding, welfare, feed optimization, and environmental resilience. Hands-on sessions will cover reproducible ML workflows (from feature engineering to model validation and uncertainty communication), while quantum-centric modules introduce practical electronic-structure calculations to estimate key physicochemical properties relevant to water quality, nutrient transformations, drug and vaccine candidates, and contaminant fate. Molecular simulation blocks will demonstrate multiscale strategies from coarse-grained dynamics to atomistic free-energy methods for host–pathogen interactions, vaccine epitope stability, antimicrobial resistance targets, and stress biology under changing temperature, salinity, and pH. The workshop emphasizes FAIR data, open-source tools, and hackathon-style sprints that culminate in shareable protocols, benchmark datasets, and prototype decision-support dashboards for sustainable, climate-aware aquaculture. By blending lectures with practical clinics and cross-disciplinary project work, BIOAQUA will build capacity across Europe's Blue Economy, foster new collaborations between wet-lab and computational teams, and accelerate the translation of digital aquaculture science into measurable on-farm impact.

Scientific Committee:
Orkun Hasekioğlu (TBAE)
Orkide Coşkuner-Weber (Turkish-German Uni.)

Organization Committee:
Bilal Kılıç (TBAE)
Ekrem Oğuzhan Angüner (TBAE)
Erbil Can Artun (TBAE)
Orkun Hasekioğlu (TBAE)

Lecturers:
Orkide Coşkuner-Weber (Turkish-German Uni.)
Uğur Sezerman (Acıbadem Uni.)
Onur Pusuluk (Kadir Has Uni.)
Semih Alpsoy (Turkish-German Uni.)
Sinan Eyüboğlu (Gebze Technical Uni.)
Vladimir N. Uversky (Uni. of South Florida)
İrem Argın (Turkish-German Uni.)
Ali Arslan (Acıbadem Uni.)
Mustafa Samet Pir (Acıbadem Uni.)
Tayyip Karaman (Acıbadem Uni.)
Berkay Yekta Ekren (Acıbadem Uni.)
Hakan Doga (IBM, USA)

Date & Location:
20 - 24 October 2025
TÜBİTAK Gebze Yerleşkesi,
Temel Bilimler Araştırma Enstitüsü
Gebze / Kocaeli

Application Requirements:
M.Sc. & Ph.D. students, post-doctoral researchers in related fields are strongly encouraged to apply and will be given priority for the face-to-face participation.

Strong background in Python programming, Mathematics, Physics, and Biology.
- Approval requires a transcript
- Proven record of succesfully taken courses

Online participation is possible via Zoom.
- No prerequisities needed

Application Deadline:
13 October 2025

COST — EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

BioAqua — Sustainable aquaculture solutions

Funded by the European Union

Application Web Page:
https://tbae.tubitak.gov.tr/computational_life_sciences_and_aquaculture