

BASIC INFORMATION

Duration of the elective: 1 month

Number of students: 1

Prerequisites: None

Location(s): Koç University Rumelifeneri Campus, Koç University Hospital (KUTTAM)

CONTACT INFORMATION

Elective Director: Prof. Dr. Tamer Önder

Elective Faculty: Nazlı Başak, Caner Süsal, Devrim Gözüaçık, Tuğba Bağcı Önder, Ceyda Açılan Ayhan, Yıldız Tütüncü, Gözde Korkmaz, Ece Öztürk, Zelal Adıgüzel, Tamer Önder

BRIEF DESCRIPTION OF STUDENT ACTIVITIES

Medical Biology forms a bridge between basic research and clinical medicine. It is the cornerstone of modern healthcare, biomedical research, and advanced drug development.

This elective will introduce students to advanced cell and molecular biology techniques used in the research program of the faculty including, but not limited to, cancer biology, stem cell biology, tissue culture, cellular reprogramming, and genome editing.

Students who express interest in an ongoing research project by Medical Biology faculty will initially contact the PI, and if a mutual agreement is made, they can apply for the elective. This elective can be taken in the 5th or 6th year.

LEARNING OBJECTIVES

Students will formulate a novel hypothesis and test it with appropriate experimentation. Students will gain skills in understanding primary literature, planning experiments with appropriate controls, keeping careful records.

Specific objectives are:

Gather and analyze experimental data using appropriate techniques

Keep record of data using a laboratory notebook and relevant software

Present data using tables and graphs and interpret the findings

Plan research project according to scientific principles and relevant methodologies

Access up to date literature on the scientific question and assess it critically

Perform mammalian tissue culture using appropriate aseptic technique

Perform transfection and gene delivery using viral vectors

Carry out decontamination, disinfection, and biological waste disposal according to laboratory guidelines.

Extraction of RNA, DNA and proteins from cultured cells, tissues and/or patient-derived biological samples

Analyze protein expression using immunofluorescence and/or immunoblotting

Quantify relative gene expression levels using quantitative PCR

Perform molecular cloning to generate DNA vectors for gene expression, gene suppression or gene editing

Prepare samples for DNA sequencing, analyze sequencing results, and use publicly available genomic databases to interpret findings

ASSESSMENT OR EVALUATION

1 – Students will prepare a presentation focusing upon the work completed. The presentation will be 20 minutes long and will be followed by 5-10 minutes of questions.

2 – Students will keep a laboratory notebook and write a final report describing methodology and results