The Hebrew University of Jerusalem

Syllabus

Introduction to applied Molecular Biology - 94664

Last update 22-01-2024

HU Credits: 2

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Bio-Medical Sciences

Academic year: 0

Semester: 1st Semester

Teaching Languages: Hebrew

Campus: Ein Karem

Course/Module Coordinator: Prof Joel Yisraeli

Coordinator Email: joely@ekmd.huji.ac.il

Coordinator Office Hours: Contact by email to set up an appointment

Teaching Staff:

Prof Joel Yisraeli,
Prof Tally Naveh-Many,
Ms. Tirza Bidany,
Mr. Natan Florsheim,
Ms. Tehila Gershon,
Mr. Wajeeh Salaymeh

Course/Module description:
To expose students to molecular biology techniques by participating in an ongoing project to clone, characterize, and express a given gene

Course/Module aims:
To experience the thrill of molecular biology and to concretize subjects learned in a parallel lecture course on molecular biology

Learning outcomes - On successful completion of this module, students should be able to:
To perform basic techniques and strategies employed in standard molecular biology labs today:
1. DNA cloning
2. Restriction mapping
3. DNA and RNA analysis
4. PCR and RT-PCR
5. Basic bioinformatic analysis
6. Recombinant protein expression and analysis

Attendance requirements(%):
100%

Teaching arrangement and method of instruction: Lab instruction

Course/Module Content:
Lab 1 – Introduction, preparing solutions
Preparing competent cells, ligation

Lab 2 – Extracting plasmid DNA and preparing for sequencing

Lab 3- Computer lab - NCBI searches, RNA comparisons, protein comparisons

Lab 4 – Computer lab - in silico restriction enzyme digestion and characterisation and transfer to an expression vector. Theoretical transfection into animal cells.

Lab 5 – Extracting RNA from HEK 293 cells and electrophoresis of RNA. Preparation of cDNA and analysis by PCR.

Lab 6 – Electrophoresis of PCR products. Protein gel electrophoresis and transfer.

Lab 7 – Western blot

Lab 8 - Summary seminars

Required Reading:
online lab manuals

Additional Reading Material:

Grading Scheme:
Active Participation / Team Assignment 10 %
Submission assignments during the semester: Exercises / Essays / Audits / Reports / Forum / Simulation / others 40 %
Mid-terms exams 20 %
Personal Guide / Tutor / Team Evaluation 10 %
Presentation / Poster Presentation / Lecture 20 %

Additional information: