האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

Molecular Medicine and Oncogenomics - 94812

Last update 17-03-2020

HU Credits: 4

Degree/Cycle: 2nd degree (Master)

Responsible Department: Bio-Medical Sciences

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: Ein Karem

Course/Module Coordinator: Prof. Rotem Karni

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

Coordinator Office Hours: Sunday 17-18

Teaching Staff:

Dr. Sheera Adar,
Dr. OREN PARNAS,
Prof Rotem Karni,
Prof Michal Lotem,
Prof Hermona Soreq

Course/Module description:

Understanding the molecular basis for several genetic diseases including cancer, genome-based diagnosis of these diseases, and their therapy by different molecules and treatments.

Course/Module aims:

1. To understand the molecular basis for several human diseases.
2. To understand the new diagnostic tools available to diagnose these diseases.
3. The current treatments and novel treatments which are developed to treat these diseases.

Learning outcomes - On successful completion of this module, students should be able to:

Understanding of the molecular basis of several human diseases, the new diagnostic tools and the current and novel treatments for these diseases.

Attendance requirements(%):

Teaching arrangement and method of instruction: Lectures

Course/Module Content:

1. Introduction for genome complexity and genomic changes that lead to the development of genetic diseases including cancer. Understanding of the different types of mutations (nonsense, missense, synonymous, deletions, amplifications ect').
2. Diseases developed because of hyperactivity of enzymes and enzyme inhibitors as drugs. Kinase inhibitors as drugs and anti-cancer drugs.
3. The molecular basis for drug resistance to kinase inhibitors.
4. Transcription, alternative splicing and diseases emanating from misregulation of these processes.
5. Genetic diseases because of gene loss of function and their novel treatments (DMD, DM1, CF, TZ, SMA) including small molecules, oligonucleotides, genomic

editing ect').
6. Using genomic editing for research and therapy.
7. Cancer as a genomic diseases, genomic diagnosis for personalized medicine.
8. Introduction to immunotherapy for cancer treatment.

Required Reading:
1. Molecular Biology of the Cell (Alberts) sixth edition
2. Cooper TA, Wan L, Dreyfuss G. (2009). RNA and disease. Cell. 136:777-93.
3. Cartegni L, Chew SL, Krainer AR. (2002). Listening to silence and understanding nonsense: exonic mutations that affect splicing. Nat Rev Genet. 2002 Apr;3(4):285-98
4. Additional recent papers.

Additional Reading Material:

Course/Module evaluation:
End of year written/oral examination 100 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information: