The Hebrew University of Jerusalem

Syllabus

SELECTED TOPICS IN STRUCTURE AND FUNCTION OF GPCR - 71136

Last update 10-03-2019

HU Credits: 2

Degree/Cycle: 2nd degree (Master)

Responsible Department: Biochemistry, Food Science and Nutrition

Academic year: 0

Semester: 2nd Semester

Teaching Languages: English

Campus: Rehovot

Course/Module Coordinator: Prof. Masha Niv
http://departments.agri.huji.ac.il/biochemfoodsci722/teachers/niv_masha/lab/

Coordinator Email: masha.niv@mail.huji.ac.il

Coordinator Office Hours: by email appointment

Teaching Staff:
Prof Masha Niv

Course/Module description:
The course will be given in English. The target audience is MSc and PHD students interested in GPCRs. Particular emphasis will be given to structural aspects.

Course/Module aims:
**Gain knowledge in the field of GPCRs structure and function,*

**Practice critical reading and summarizing of scientific papers*

Learning outcomes - On successful completion of this module, students should be able to:
1) Knowing main milestones in GPCR structural discovery
a. Nobel prize in Chemistry 2012
b. Current status of structural information (GPCRDB)
2) Being able to find, download and visualize the structure of GPCR of interest
3) Obtain and visualize a homology model of GPCR of interest
4) Contribute new information to a wiki page of receptor of interest

Attendance requirements(%):
100%

Teaching arrangement and method of instruction: Reading
Lectures
Discussion in small groups and in class
Working with PDB files
Writing short texts

Course/Module Content:
1) Families A, B and C of GPCRs and main characteristics of GPCR structure, GPCRs in drug discovery

2) Glucagon receptors – emphasis on downstream signaling (guest lecture – Dr. Ido Goldstein https://www.ido-goldstein-lab.com/)
3) Main methods for structure determination (Xray, cryoEM)
4) Orthosteric vs allosteric binding sites, coupling to G-proteins, biased signaling
5) CB1, Electron Microscopy and the resolution revolution (Guest lecture – Dr. Moran Shalev-Benami)
https://www.weizmann.ac.il/Structural_Biology/Shalev-Benami/publications
6) Taste GPCRs
7) Serotonin receptor and LSD

Practical skills:
1) Practice writing scientific review (as in refereeing a paper for a journal)
2) Learn to visualize GPCR structures and be able to identify (in 3D) regions of interest (interactions, ligand binding etc.)
3) Compare an original scientific paper to a popular science piece describing it
4) Edit wiki pages related to the receptor of interest.

Required Reading:
Paper #1 The Structural Basis of G-Protein-Coupled Receptor Signaling (Nobel Lecture) Brian Kobilka
Feedback via moodle by 15.5.2019

Paper #2 Trends in GPCR drug discovery: new agents, targets and indications Hauser et al
Feedback via moodle by 15.6.2019
Additional papers will be uploaded on moodle

Additional Reading Material:
see course moodle

Course/Module evaluation:
End of year written/oral examination 0 %
Presentation 0 %
Participation in Tutorials 30 %
Project work 50 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 20 %
Other 0 %

Additional information:

Active participation is expected