TECHNION Israel Institute of Technology | The Ruth and Bruce Rappaport Faculty of Medicine

Course Syllabus No. 2760431 Spring 2025
Name of Course Free Radicals in Biology and Medicine
Credit Points__2

Course teaching staff
Course coordinator____Moran Benhar_____
Contact Information_____benhar@technion.ac.il_____
Reception times_____Thursdays, 10:30-11:30_____
Additional lecturers in the course: Simone Engelender, simone@technion.ac.il

Course structure and times
Lecture Days and Hours- Sundays 9:30-11:30 Lecture room - 4th floor seminar room

Course assignments
1. Student presentation _Date of Submission__During the semester_____
2. Writing assignment __Date of Submission_____Until 30.6.2025___

Course attendance
Lecture attendance: 80%
Attendance in other course activities: 70%

pre-course requirements
Basic knowledge of cell biology and biochemistry (Technion courses, 134058, 274241, or similar)

Recommended resources for the course:
Free Radicals in Biology and Medicine. Barry Halliwell and John M.C. Gutteridge

Overarching goal: To develop an understanding of the roles of oxidants and antioxidants in biological processes and human diseases

Objectives: At the end of the course, the student with be able to:
1. Describe the types and physiological roles of reactive oxygen species and antioxidants.
2. Describe the cellular response to oxidative stress.
3. Will be familiar with the roles of reactive oxygen species in human immunity and disease.

Details of the course objectives:
The student will specify: (1) the main types of reactive oxygen species (free radicals and non-free radicals) and antioxidants; (2) the main roles of oxidants/antioxidants, and the cellular responses to oxidative stress; (3) the main physiological roles and mechanisms of action of oxidants/antioxidants, in particular in the immune systems; (4) the contribution of oxidative stress to pathological processes and human diseases, including neurodegenerative diseases and cancer.

The Lecture topics in the course according to the weeks of the semester

Date	Subject of the lecture	Name of lecturer	Chapters and pages in the course textbook
30.3.2025	Introduction to redox biology	Moran Benhar	
6.4.2025	Nitric oxide: biochemistry and signaling	Moran Benhar	
20.4.2025	Free radicals and cellular degradation pathway: implications in neurodegeneration	Simone Engelender	
27.4.2025	PBL – analysis of published work in redox biology and medicine	Moran Benhar / Simone Engelender	
4.5.2025	To be determined	Student presentation / group discussion	
11.5.2025	To be determined	Student presentation / group discussion	
18.5.2025	To be determined	Student presentation / group discussion	
25.5.2025	To be determined	Student presentation / group discussion	
8.6.2025	To be determined	Student presentation / group discussion	
15.6.2025	To be determined	Student presentation / group discussion	
22.6.2025	To be determined	Student presentation / group discussion	
29.6.2025	To be determined	Student presentation / group discussion	
6.7.2025	Reserve		

Teaching methods

Frontal lecture / student self-work / teaching in small groups

Assessment tools:

Student presentation and writing assignment

Composition of Course Grade

Assignments (presentation and writing assignment): 80%

Student participation in class: 20%