Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering
Genetic and Bioengineering Department
2023-2024 Fall Semester

Syllabus

Code/Name	Sec 403.1 / Cell Culture Techniques
Type	Elective
Credit/ECTS	5/5
Hour per Week	3 (3+0+0)
Level/Year	Undergraduate/4
Semester	Fall
Classroom	D305
Content	Theoretical and practical introduction to the culture of different types of human and animal cells in the laboratory and how these cells can be transfected to over-express or turn off the expression of different genes.
Prerequisites	---------
Textbooks	***Primary*** Culture of Animal Cells: A Manual of Basic Technique, 5th Edition. R. Ian Freshney. ***Supplementary*** Cell Culture Manual 3 rd Edition of the SigmaAldrich Cell Culture Manual available free on line: http://www.sigmaaldrich.com/lifescience/cell-culture/learning-center/cell-culture-manual.htm
Objectives	• The course should provide the student with knowledge such that the student can carry out basic cell-culture techniques properly and safely, and explain factors of significance in the cultivation of cells in vitro. • On completion of the course, the student should be able to: - account, at a general level, for the structure and function and maintenance of an LAF/sterile bench • Explain how mycoplasma contamination affects eukaryotic cells - account in detail for sterilization equipment and different sterilization techniques • Account for different cell culture media and important components in the media • Explain the concept of transformation and describe different transformation methods • Be able to apply basic cell culture techniques, such as calculation and harvesting of cells • Explain different factors of significance in the cultivation of cells in vitro
Course Outcomes	In this course you will be able to: CO1 describe differences between cell lines and primary cells CO2 describe what is needed to culture cells in the laboratory CO3 describe different types of contaminations that can appear in cell cultures CO4 explain what stem cells are culture cell lines and perform a transfection of cells CO5 choose different ways of culture depending on cell type and purpose CO6 plan a research experiment using mammalian cells, choose a suitable cell system to perform different kinds of experiments.

Weekly Schedule of Topics

W	Topic
1	Introduction & biology of cultured cells
2	Equipments, aseptic techniques, safety protocols
3	Culture vessels
4	Media development

5	Serum-free medium development
6	Sterilization
7	Primary culture
8	Secondary culture
9	Cloning & selection
10	Cell separation, characterization
11	Differentiation & transformation
12	Contamination
13	Cryo-preservation & cyto-toxicity
14	Organo-typic culture & specialized cell culture techniques

Professional Contribution	To have knowledge that will allow working in companies or research laboratories working on cell culture, to be able to design research and projects on cell culture

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	2	2	3	4	2	2	2	3	3	3	4
CO2	2	1	3	3	3	4	3	3	3	0	5
CO3	2	3	2	4	3	4	2	1	2	2	4
CO4	3	3	3	3	3	3	3	2	3	3	4
CO5	3	1	3	4	3	3	1	3	1	2	3
CO6	2	2	2	2	3	4	2	2	2	3	2

* Contribution Level | 0: None | 1: Very Low | 2: Low | 3: Medium | 4: High | 5: Very High

Special Conditions	• Students work in groups for project and presentations.
Requirements	Basic knowledge of Cell Biology, Molecular Cell Biology and Biochemistry
Course Policy	• Be in the class on time. • English should always be used to communicate with one another. • At least **70%** attendance is required, otherwise a grade of **DZ** will be assigned.
Cheating & Plagiarism	• Copying or letting someone copy your work on exams, assignments, or reports is cheating. • Cutting and pasting text, figures and tables from web sources or any other electronic source is plagiarism. • The consequence of academic dishonesty is to receive a grade of **FF** for the course.
Evaluation	Mid-term Exam 30% Presentation 20% Final Exam 50% Total 100%
Rubric	----------

Instructor

Name/Surname	Ayşe Erdoğan	Email	ayse.erdogan@alanya.edu.tr
Room	330	Office Hours	W 13:30-15:30

Prepared by Dr. Ayşe Erdoğan-17.10.2024