

Medicine			
Bachelor	TR-NQF-HE: Level 7	QF-EHEA: Second Cycle	EQF-LLL: Level 7

## Course Introduction and Application Information

Course Code:	TIP046		
Course Name:	CRISPR: Gene Editing Applications 2		
Semester:	Fall Spring		
Course Credits:	<div>ECTS</div> <div>2</div>		
Language of instruction:	Turkish		
Course Condition:			
Does the Course Require Work Experience?:	No		
Type of course:	Departmental Elective		
Course Level:	<div> <div>Bachelor</div> <div>TR-NQF-HE:7. Master`s Degree</div> <div>QF-EHEA:Second Cycle</div> <div>EQF-LLL:7. Master`s Degree</div> </div>		
Mode of Delivery:	E-Learning		
Course Coordinator:	Dr. Öğr. Üy. AYCA ZEYNEP İLTER		
Course Lecturer(s):	Ayca Ilter, Özgür Tataroğlu		
Course Assistants:			

## Course Objective and Content

Course Objectives:	To give information about new generation treatment methods and applications for diseases by using new generation cellular therapies and gene therapy models in medicine
Course Content:	Introduction to gene therapy and genome modification, gene manipulation methods, synthetic gene design, CRISPR-Cas-based genome modification, information about viral and non-viral

gene transfer methods, current gene therapy methods used in diseases such as cancer, DMD, SMA, sickle cell anemia, AIDS.

## Learning Outcomes

The students who have succeeded in this course;

- 1) Learning about genome modification
- 2) Information about tools used in gene editing
- 3) how to analyze gene modifications in mammalian cell
- 4) Learning the basics of CRISPR-Cas techniques
- 5) Learning current gene therapies or approaches used in diseases
- 6) Learning about gene delivery methods, applications and challenges

## Course Flow Plan

Week	Subject	Related Preparation
1)	Introduction to Gene Therapy and genome modifications	
2)	Gene manipulation methods	
3)	Synthetic gene design	
4)	Basic concepts of molecular cloning	
5)	CRISPR based gene editing-I	
6)	CRISPR-Cas based gene editing-II	
7)	Midterm Exam	
8)	Gene delivery methods-I (Non-viral methods)	
9)	Gene delivery methods-II (Viral Methods)	
10)	Use of genetically modified immune system cells in cancer treatment (Chimeric Antigen Receptor T cell Therapy)	
11)	Gene therapy methods used in AIDS (Acquired Immune Deficiency Syndrome) treatment	
12)	Gene therapy methods used in Duchenne Muscular Dystrophy (DMD) treatment	
13)	Gene therapy methods used in Sickle cell disease	
14)	Gene therapy methods used in Spinal Muscular Atrophy (SMA)	
15)	Final Exam	

## Sources

Course Notes / Textbooks:	Dersin kaynak kitabı bulunmamaktadır. / The course does not have a mandatory resource.
References:	Güncel makaleler

## Course - Program Learning Outcome Relationship

Course Learning Outcomes	1	2	3	4	5	6
Program Outcomes						
1) When Istinye University Faculty of Medicine student is graduated who knows the historical development of medicine, medical practices, and the medical profession and their importance for society.						
2) knows the normal structure and function of the human body at the level of molecules, cells, tissues, organs and systems.						
3) is capable of systematically taking an accurate and effective social and medical history from their patients and make a comprehensive physical examination.						
4) knows the laboratory procedures related to diseases; In primary care, the necessary material (blood, urine, etc.) can be obtained from the patient with appropriate methods and can perform the necessary laboratory procedures for diagnosis and follow-up or request laboratory tests.						
5) can distinguish pathological changes in structure and functions during diseases from physiological changes and can Interpret the patient's history, physical examination, laboratory and imaging findings, and arrive at a pre-diagnosis and diagnosis of the patient's problem.						
6) knows, plans and applies primary care and emergency medical treatment practices, rehabilitation stages.						
7) can keep patient records accurately and efficiently, know the importance of confidentiality of patient information and records, and protects this privacy.						
8) knows the clinical decision-making process, evidence-based medicine practices and current approaches.						
9) knows and applies the basic principles of preventive health measures and the protection of individuals from diseases and improving health, and recognizes the individual and/or society at risk, undertakes the responsibility						

of the physician in public health problems such as epidemics and pandemics.						
<b>Course Learning Outcomes</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
10) knows the biopsychosocial approach, evaluates the causes of diseases by considering the individual and his / her environment.						
11) is capable of having effective oral and/or written communication with patients and their relatives, society and colleagues.						
12) knows the techniques, methods and rules of researching. It contributes to the creation, sharing, implementation and development of new professional knowledge and practices by using science and scientific method within the framework of ethical rules.						
13) can collect health data, analyze them, present them in summary, and prepare forensic reports.						
14) knows the place of physicians as an educator, administrator and researcher in delivery of health care. It takes responsibility for the professional and personal development of own and colleagues in all interdisciplinary teams established to increase the health level of the society.						
15) knows employee health, environment and occupational safety issues and takes responsibility when necessary.						
16) knows health policies and is able to evaluate their effects in the field of application.						
17) keeps medical knowledge up-to-date within the framework of lifelong learning responsibility.						
18) applies own profession by knowing about ethical obligations and legal responsibilities, prioritizing human values and with self-sacrifice throughout own medical life.						

### Course - Learning Outcome Relationship

No Effect	1 Lowest	2 Average	3 Highest

	Program Outcomes	Level of Contribution
1)	When Istinye University Faculty of Medicine student is graduated who knows the historical development of medicine, medical practices, and the medical profession and their importance for society.	2

2)	knows the normal structure and function of the human body at the level of molecules, cells, tissues, organs and systems.	3
3)	is capable of systematically taking an accurate and effective social and medical history from their patients and make a comprehensive physical examination.	1
4)	knows the laboratory procedures related to diseases; In primary care, the necessary material (blood, urine, etc.) can be obtained from the patient with appropriate methods and can perform the necessary laboratory procedures for diagnosis and follow-up or request laboratory tests.	1
5)	can distinguish pathological changes in structure and functions during diseases from physiological changes and can Interpret the patient's history, physical examination, laboratory and imaging findings, and arrive at a pre-diagnosis and diagnosis of the patient's problem.	1
6)	knows, plans and applies primary care and emergency medical treatment practices, rehabilitation stages.	1
7)	can keep patient records accurately and efficiently, know the importance of confidentiality of patient information and records, and protects this privacy.	1
8)	knows the clinical decision-making process, evidence-based medicine practices and current approaches.	3
9)	knows and applies the basic principles of preventive health measures and the protection of individuals from diseases and improving health, and recognizes the individual and/or society at risk, undertakes the responsibility of the physician in public health problems such as epidemics and pandemics.	1
10)	knows the biopsychosocial approach, evaluates the causes of diseases by considering the individual and his / her environment.	1
11)	is capable of having effective oral and/or written communication with patients and their relatives, society and colleagues.	1
12)	knows the techniques, methods and rules of researching. It contributes to the creation, sharing, implementation and development of new professional knowledge and practices by using science and scientific method within the framework of ethical rules.	3
13)	can collect health data, analyze them, present them in summary, and prepare forensic reports.	1
14)	knows the place of physicians as an educator, administrator and researcher in delivery of health care. It takes responsibility for the professional and personal development of own and colleagues in all interdisciplinary teams established to increase the health level of the society.	3

15)	knows employee health, environment and occupational safety issues and takes responsibility when necessary.	1
16)	knows health policies and is able to evaluate their effects in the field of application.	2
17)	keeps medical knowledge up-to-date within the framework of lifelong learning responsibility.	3
18)	applies own profession by knowing about ethical obligations and legal responsibilities, prioritizing human values and with self-sacrifice throughout own medical life.	3

### Assessment & Grading

Semester Requirements	Number of Activities	Level of Contribution
Midterms	1	% 30
Final	1	% 70
<b>total</b>		<b>% 100</b>
PERCENTAGE OF SEMESTER WORK		% 30
PERCENTAGE OF FINAL WORK		% 70
<b>total</b>		<b>% 100</b>

### Workload and ECTS Credit Calculation

Activities	Number of Activities	Preparation for the Activity	Spent for the Activity Itself	Completing the Activity Requirements	Workload
Course Hours	2	0	1	15	32
Study Hours Out of Class	1	0	1	1	2
Midterms	1	0	2	2	4
Final	1	0	2	2	4
<b>Total Workload</b>					<b>42</b>