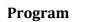
AGU Graduate School of Engineering and Science





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COURSE RECORD	
Code BENG 623	
Name	
Transgenic mice	
Hour per week	3 (3 + 0)
Credit 3	
ECTS 10	
Level/Year	Graduate
Semester	-
Туре	Elective
Location	AGU
Prerequisites	None
Special Conditions	-
Coordinator(s)	Assistant Prof. Mona El Khatib
Webpage	
Content	Transgenic mice are a valuable model in order to study various human
	pathologies. This course provides a theoretical overview about the generation
	of transgenic mice. Moreover, different gene alteration techniques and
	transgenic mouse models will be discussed throughout the course. By the end
	of the course, students will be able to design and choose the best transgenic
	mouse model that best serve their experimental design.
Objectives	- Overview about embryonic stem cells and embryo transfer
	- Overview about gene alteration techniques
	- Explain the theory behind the generation of transgenic mice and its
	process
	- Usage of transgenic mice in basic and translational research
	- Discuss the best mouse models available to study various human
	pathologies
Learning	LO1: Understand the theory behind the generation of transgenic mice
Outcomes	LO2: Be able to explain how genetic alterations are made and which techniques
	are used in the process of the generation of the desired mouse model.
	LO3: Be able to model human diseases in mice and be able to choose the right
	transgenic mouse model for that
	LO4: Understand the importance and limitations of transgenic mice in
	translational research.
Requirements	None.
Reading List	Research articles.
Ethical Rules and	
Course Policy	

LEARNING ACTIVITIES Please, use this one as a reference for your course

Activities	Number	Weight (%)
Lecture	7	30%
Group Works	2	35%
Presentations	7	35%
Site Visits	0	0%
	Total	100

ASSESSMENT

Evaluation Criteria	Weight (%)
Quizzes	20%
Weekly Assignments	15%
Group Project Assignments & Presentations	30%

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Attendance/Participation	05%	
Final Exam/Submission	40%	
	Total 100%	

For a detailed description of grading policy and scale, please refer to the website https://goo.gl/HbPM2y section 28.

COURSE LOAD *Please, use this one as a reference for your course*

Activity	Duration (hour)	Quantity	Work Load (hour)
In class activities	2	14	28
Lab	0	0	0
Group work	2	12	24
Research (web, library)	6	14	84
Required Readings	3	14	42
Pre-work for Presentation	5	14	70
Lab reports	0	0	0
-		General Sum	248

ECTS: 10 (Work Load/25-30)

CONTRIBUTION TO PROGRAMME OUTCOMES*

	P01	P02	P03	P04	P05	P06	P07	P08	P09	PO10	P011	PO12	PO13	P014
L01	3	5	3	4	5	5	5	4						
LO2	3	5	3	4	5	5	4	4						
LO3	3	5	5	5	5	4	4	5						
L04	3	5	5	5	5	5	5	5						

^{*} Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

WEEKLY SCHEDULE

EKLY SCHEDULE	
Topic	Outcomes
Introduction to the concept of transgenic animals and the different	L01, L02
methods of genetic alterations	<u></u>
Activity: None	
Embryonic stem cell transfer and the injection of nucleic acids into the	LO1, LO2
pronucleus and cytoplasm of fertilized mouse oocyte	<u></u>
Activity: Research article discussion	
Usage of transgenic mice	L01, L02, L03
Activity: Research article discussion	
Homologous Recombinatson and the Cre/lox system	L01, L02
Activity: Research article discussion	
How to generate mutant mouse models?	L01, L02
Activity: Research article discussion	
CRISPR/Cas9 gene editing technology in mice	L01, L02, L03,
Activity: Research article discussion	L04
Cancer Mouse Models	L01, L02, L03,
Activity: Research article discussion	L04
Mouse Models of Cardiovascular diseases	L01, L02, L03,
Activity: Research article discussion	L04
Mouse Models of Cardiovascular diseases	L01, L02, L03,
Activity: Research article discussion	L04
Mouse Models in Metabolic Disorders	L01, L02, L03,
Activity: Research article discussion	L04
Mouse Models in Neurodegenerative diseases	L01, L02, L03,
Activity: Research article discussion	L04
Humanized Mouse Models	L01, L02, L03,
Activity: Research article discussion	L04
	Introduction to the concept of transgenic animals and the different methods of genetic alterations Activity: None Embryonic stem cell transfer and the injection of nucleic acids into the pronucleus and cytoplasm of fertilized mouse oocyte Activity: Research article discussion Usage of transgenic mice Activity: Research article discussion Homologous Recombinatson and the Cre/lox system Activity: Research article discussion How to generate mutant mouse models? Activity: Research article discussion CRISPR/Cas9 gene editing technology in mice Activity: Research article discussion Cancer Mouse Models Activity: Research article discussion Mouse Models of Cardiovascular diseases Activity: Research article discussion Mouse Models in Metabolic Disorders Activity: Research article discussion Mouse Models in Neurodegenerative diseases Activity: Research article discussion Mouse Models in Neurodegenerative diseases Activity: Research article discussion Mouse Models in Neurodegenerative diseases Activity: Research article discussion Mouse Models in Neurodegenerative diseases Activity: Research article discussion Humanized Mouse Models

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13	Alternative methods	L01, L02, L03,
	Activity: Research article discussion	L04
14	Ethical Aspects in Using Transgenic Mice	LO1, LO2, LO3,
	Activity: Research article discussion	L04

Prepared by Mona El Khatib Date 17/07/2018