

COURSE RECORD

Code	BENG 623
Name	Transgenic mice
Hour per week	3 (3 + 0)
Credit	3
ECTS	7,5
Level/Year	Graduate
Semester	-
Type	Elective
Location	AGU
Prerequisites	None
Special Conditions	-
Coordinator(s)	
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	<ul style="list-style-type: none"> - 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 Outcomes	L01: Understand the theory behind the generation of transgenic mice L02: 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. L03: Be able to model human diseases in mice and be able to choose the right transgenic mouse model for that L04: 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%

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: 7,5(Work Load/25-30)

CONTRIBUTION TO PROGRAMME OUTCOMES*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14
LO1	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						
LO4	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

W	Topic	Outcomes
1	Introduction to the concept of transgenic animals and the different methods of genetic alterations Activity: None	LO1, LO2
2	Embryonic stem cell transfer and the injection of nucleic acids into the pronucleus and cytoplasm of fertilized mouse oocyte Activity: Research article discussion	LO1, LO2
3	Usage of transgenic mice Activity: Research article discussion	LO1, LO2, LO3
4	Homologous Recombination and the Cre/lox system Activity: Research article discussion	LO1, LO2
5	How to generate mutant mouse models? Activity: Research article discussion	LO1, LO2
6	CRISPR/Cas9 gene editing technology in mice Activity: Research article discussion	LO1, LO2, LO3, LO4
7	Cancer Mouse Models Activity: Research article discussion	LO1, LO2, LO3, LO4
8	Mouse Models of Cardiovascular diseases Activity: Research article discussion	LO1, LO2, LO3, LO4
9	Mouse Models of Cardiovascular diseases Activity: Research article discussion	LO1, LO2, LO3, LO4
10	Mouse Models in Metabolic Disorders Activity: Research article discussion	LO1, LO2, LO3, LO4
11	Mouse Models in Neurodegenerative diseases Activity: Research article discussion	LO1, LO2, LO3, LO4
12	Humanized Mouse Models Activity: Research article discussion	LO1, LO2, LO3, LO4

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