

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Health Sciences		
ACADEMIC UNIT	Faculty of Medicine		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	IAE408	SEMESTER	5th
COURSE TITLE	INTRODUCTION TO STEM CELL BIOLOGY		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>	WEEKLY TEACHING HOURS	CREDITS	
Lectures	2	2	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (4).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Special background Skills development		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://ecourse.uoi.gr/course/view.php?id=132		

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The elective course aims to present the current developments in the field of Stem Cells. Students are taught the properties of embryonic and stem cells from adult tissues, a field that is developing rapidly and is a cutting-edge field with great prospects for application in Regenerative Medicine. The course focuses on the detailed study of the characteristics, the mechanisms of differentiation and self-renewal and the applications that stem cells find at the experimental and clinical level. During the analysis of the above, a broad range of knowledge is collected, spanning from cell differentiation/proliferation, gene regulation to tissue regeneration/regeneration and cancer.

The thematic units of the course aim to:

- (a) understanding the differences between germ cell types;
- (b) understanding the transcriptional networks and epigenetic factors that regulate pluripotency status and cellular reprogramming;
- (c) familiarity with recent applications of stem cells in clinical studies of Regenerative Medicine.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>
<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>
<i>Decision-making</i>	<i>Respect for the natural environment</i>
<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>
<i>Team work</i>	<i>Criticism and self-criticism</i>
<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>
<i>Working in an interdisciplinary environment</i>
<i>Production of new research ideas</i>	<i>Others...</i>

- Search, analysis and synthesis of data and information, using the necessary technologies
- Teamwork
- Work in an international environment
- Working in an interdisciplinary environment
- Generation of new research ideas

(3) SYLLABUS

Pluripotent stem cells: The special properties of stem cells, Embryonic stem cells, Precursor gametocytes.

Multipotent stem cells: Microenvironment and niche. Somatic stem cells of adult tissues, mesenchymal cells, the problem of "plasticity".

Transcription factors and epigenetic regulation: Growth factors and survival factors. Gene networks that determine the undifferentiated state ("stemness"). Epigenetic components. Cell Cycle

In vitro differentiation of Embryonic Stem Cells: Differentiation methods towards endoderm, mesoderm and neuroectoderm.
Signaling pathways that induce target-directed differentiation.

Cancer stem cells: The biology of teratocarcinoma. Cancer stem cells and cancer therapy.

Applications of stem cells (embryonic and adult) in Regenerative Medicine

Regenerative capacity of animal tissues. The problem of organ replacement.
Autologous grafts. Ex vivo tissue production

Cell therapy

Clinical trials and applications of stem cell technology.
Current topics in Regenerative Medicine through cell therapy.

(4) TEACHING and LEARNING METHODS - EVALUATION

<p>DELIVERY <i>Face-to-face, Distance learning, etc.</i></p>	<p>The theoretical part of the course is taught through lectures (in the Lecture Halls, with direct physical presence and teacher-student interaction). Additionally, as part of the tutorial exercises, students attend lectures during which they become familiar with advanced scientific research techniques.</p>
<p>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<p>Presentation of slides (powerpoint slides) and videos as part of the course's delivery. All slides and videos are registered on the University's website, asynchronous distance learning platform (e-course) and are freely accessible by students. The course slides are updated at least once a year (each academic year). Also, through the e-course, students have access to additional educational material (eg important relevant articles from the international literature). Communication with the students for practical issues, announcements, but also questions regarding a better understanding of the course material and their</p>

	preparation for the exams, is done through the e-course platform (see Messages, Discussion Forum at https://ecourse.uoi.gr/course/view.php?id=132), but also through messages to the e-mail addresses of the teachers that are available.	
<p align="center">TEACHING METHODS</p> <p><i>The manner and methods of teaching are described in detail.</i></p> <p><i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i></p> <p><i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i></p>	Activity	Workload of each students group
	Lectures	24
	Elaboration of group bibliographic study and presentation	6
<p align="center">STUDENT PERFORMANCE EVALUATION</p> <p><i>Description of the evaluation procedure</i></p> <p><i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>The evaluation is done in one or a combination of the following ways:</p> <ol style="list-style-type: none"> 1. Written test including developmental questions. 2. Elaboration of bibliographic study on topics where stem cells are used in clinical studies by individuals or a group of students. 	

(5) ATTACHED BIBLIOGRAPHY

Teaching - study material

ΤΑ ΒΛΑΣΤΙΚΑ ΚΥΤΤΑΡΑ (2008) ΓΕΩΡΓΑΤΟΣ ΣΠ.,ΚΟΥΚΛΗΣ Π.,ΛΑΖΑΡΙΔΗΣ Γ.,ΜΕΛΙΔΩΝΗ Α. - ΕΚΔΟΣΕΙΣ ΕΦΥΡΑ

ISBN: 978-960-89692-5-4

The Science of Stem Cells [Jonathan M. W. Slack] 2018 - Wiley Blackwell

ISBN 9781119235255 (epub) | ISBN 9781119235156 (hardback)

Essentials of Stem Cell Biology: Lanza R. Atala A. 2014 - Elsevier

ISBN: 978-0-12-409503-8

2) Recommendation of multiple bibliography: articles and reviews accessible via internet.