

## MODULE OUTLINE

### (1) GENERAL INFORMATION

<b>SCHOOL</b>	School of Science and Technology		
<b>PROGRAM COURSE</b>	Precision Medicine and Novel Therapies (PRETH)		
<b>LEVEL OF STUDY</b>	Postgraduate		
<b>MODULE CODE</b>	PRETH60	<b>YEAR OF STUDY</b>	2 <sup>nd</sup> (3 <sup>rd</sup> semester)
<b>MODULE TITLE</b>	Novel Therapies towards Clinical Application		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <i>in case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits</i>	<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>	
Hours per week (28-29 hours) x 13 weeks	375	15 ECTS	
<b>MODULE TYPE</b> Compulsory, Optional, Optional mandatory	Compulsory		
<b>PREREQUISITE MODULES:</b>	NONE		
<b>LANGUAGE OF INSTRUCTION AND EXAMS:</b>	English		
<b>THE MODULE IS OFFERED TO ERASMUS STUDENTS</b>	Yes		
<b>MODULE WEBSITE (URL)</b>	<a href="https://www.eap.gr/en/preth/">https://www.eap.gr/en/preth/</a> Each module has its own space in the Learning Management System of EAP, with controlled access (use of code) for students and teaching staff. <a href="https://courses.eap.gr/course/view.php?id=254">https://courses.eap.gr/course/view.php?id=254</a>		

### (2) LEARNING OUTCOMES

<p><b>Learning Outcomes</b></p> <p>The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult:</p> <p><b>APPENDIX A</b> Description of the level of learning outcomes for each level of study, in accordance with the European Higher Education Qualifications' Framework.</p> <p>Descriptive indicators for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and</p> <p><b>APPENDIX B</b> Guidelines for writing Learning Outcomes</p>
<p><b>Learning Outcomes</b></p> <p>Upon successful completion of the module, students are expected to:</p> <ul style="list-style-type: none"> <li>- Recite the regenerative possibilities with the use of stem cells</li> <li>- Describe sources of regenerative cells for cell and tissue therapy applications</li> <li>- Indicate the parameters for the successful and effective editing and modification of genomic DNA</li> <li>- Describe the principles and applications of RNAi (interference) technology</li> <li>- Describe the principles of RNA/DNA-based vaccine production</li> <li>- Name examples of beneficial novel therapies in Precision Medicine</li> </ul>

### General Competences

Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?

Search for, analysis and synthesis of data and information by the use of appropriate technologies,	Project planning and management
Adapting to new situations	Respect for diversity and multiculturalism
Decision-making	Environmental awareness
Individual/Independent work	Social, professional and ethical responsibility and sensitivity to gender issues
Group/Team work	Critical thinking
Working in an international environment	Development of free, creative and inductive thinking
Working in an interdisciplinary environment (Other.....citizenship, spiritual freedom, social innovative research awareness, altruism etc.) .....	.....

### Expected general skills that the trainees will acquire:

- Work in an international environment
- Work in an interdisciplinary environment
- Production of new research ideas
- Search, analysis and synthesis of data and information, using the necessary technologies
- Promoting free, creative and inductive thinking

### (3) MODULE CONTENT

#### Module Objectives

Precision Medicine employs individual analysis of the patient's unique biology, in order both to select more efficacious diagnostic methods and to suggest clinical treatments. Most pathologies arise from cellular damage, hence, cell therapy is key to mitigation of cell and/or tissue damage and often to repair. Stem cell therapy is a promising treatment that may be tailored to a specific illness and also to an individual patient. Autologous cell sources are the first priority for cell therapy since they are safe, do not violate ethical perspectives, and do not provoke immunogenic responses. There are various autologous cell sources, as well as heterologous, naive or technologically edited cells, all of which show great potential for therapy applications. For example, DNA editing technology through CRISPR/Cas systems is used for targeted intervention in the cell genome, while chimeric CAR-T cells provide new possibilities in immunotherapy. In addition, RNA technologies have opened new avenues for therapeutic interventions and for vaccine production. This module focuses on cell repair or substitution systems, most often through genetic engineering, all of which are essential for the future of personal health.

- Cell therapies
- CAR-T cells
- Aptamer design
- CRISPR/Cas systems for genome editing
- Gene therapy
- RNAi (interference) technology
- New vaccines

### (4) TEACHING METHODS - ASSESSMENT

<b>MODES OF DELIVERY</b> <i>Face-to-face, in-class lecturing, distance teaching and distance learning etc.</i>	Distance teaching and distance learning with three Group Counseling Meetings (GCMs) of 4 hours during the academic semester on weekends. Also, 1-2 shorter tutoring sessions.
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<p><b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY</b></p> <p><i>Use of ICT in teaching, Laboratory Education, Communication with students</i></p>	<p>In GCMs and teaching we use:</p> <ul style="list-style-type: none"> <li>- Remote meetings tools (Webex, Cisco etc.)</li> <li>- Presentation software (e.g. power point, animations etc.)</li> <li>- Specialized software in the subjects under study (NCBI PubMed, NCBI Blast, EndNote, etc.)</li> </ul> <p>In addition, students use office automation tools, web browsers and e-readers for digital books.</p> <p>Distance learning and communication with the students is supported by:</p> <ul style="list-style-type: none"> <li>- the (Hellenic Open University (HOU) digital platform <a href="http://courses.eap.gr">http://courses.eap.gr</a> (course information, educational material postings, announcements, messages, exam results, user groups, discussion forums, etc.).</li> <li>- Electronic mail (e-mail)</li> </ul>																	
<p><b>MODULE DESIGN</b></p> <p><i>Description of teaching techniques, practices and methods: Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, Internship, Art Workshop, Interactive teaching, Educational visits, projects, Essay writing, Artistic creativity, etc. The study hours for each learning activity as well as the hours of selfdirected study are given following the principles of the ECTS.</i></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><i>Activity/Method</i></th> <th style="text-align: center;"><i>Semester workload</i></th> </tr> </thead> <tbody> <tr> <td>3 GSMs x 4 hours</td> <td style="text-align: center;">12</td> </tr> <tr> <td>2 educational activities (x 10 hours)</td> <td style="text-align: center;">20</td> </tr> <tr> <td>2 Semester Assignments (x 30 hours)</td> <td style="text-align: center;">60</td> </tr> <tr> <td>Tutoring sessions</td> <td style="text-align: center;">5</td> </tr> <tr> <td>Final examination</td> <td style="text-align: center;">4</td> </tr> <tr> <td>Individual study</td> <td style="text-align: center;">274</td> </tr> <tr> <td style="text-align: center;"><b>Total module workload (hours)</b></td> <td style="text-align: center;"><b>375</b></td> </tr> </tbody> </table>		<i>Activity/Method</i>	<i>Semester workload</i>	3 GSMs x 4 hours	12	2 educational activities (x 10 hours)	20	2 Semester Assignments (x 30 hours)	60	Tutoring sessions	5	Final examination	4	Individual study	274	<b>Total module workload (hours)</b>	<b>375</b>
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<p><b>STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS</b></p> <p><i>Detailed description of the evaluation procedures:</i></p> <p><i>Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work, other.....etc.</i></p> <p><i>Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students.</i></p>	<p><b>Student Evaluation – Module Grade</b></p> <p>a. Two (2) multiple-choice (quiz) educational activities (Q), which contribute equally to the final grade with a value of 5% each.</p> <p>b. Two (2) Semester Assignments (A) which contribute equally to the final grade with a value of 15% each.</p> <p>The scoring of educational activities and assignments is activated only if the student succeeds an overall score equal to or above the base (<math>\geq 5</math>) in the final or repeat exams.</p> <p>c. Final or repeat exams (E) contributing to the final grade of the module by 60%.</p> <p>The Final Grade of the module, within scale 1-10 (10 is the excellent), is calculated as follows:</p> $\text{Final Grade} = (Q_1 \times 0.05) + (Q_2 \times 0.05) + (A_1 \times 0.15) + (A_2 \times 0.05) + (E \times 0.6)$ <p><b>Language of evaluation:</b> English</p> <p>The evaluation criteria are explicitly mentioned in the web published study guide (<a href="https://www.eap.gr/education/odigos-spoudwn-eap/">https://www.eap.gr/education/odigos-spoudwn-eap/</a>), as well as in the educational platform (<a href="http://courses.eap.gr">http://courses.eap.gr</a>), with controlled access (use of code) for students.</p>																	

## (5) SUGGESTED BIBLIOGRAPHY

### **Books**

1. "A Handbook of Gene and Cell Therapy". Nóbrega C., Mendonça L., Matos C.A. (2020), Springer, Cham. [https://doi.org/10.1007/978-3-030-41333-0\\_12](https://doi.org/10.1007/978-3-030-41333-0_12).
2. Chapters from Alberts, B., Johnson, A., Lewis, J., Morgan, D., Raff, M., Roberts, K., & Walter, P. (2015). Molecular biology of the cell Sixth edition. Garland Science Taylor and Francis Group, New York NY.

### **Scientific Journals**

Recent, relevant, and open access scientific publications, available at the MEDLINE database of references and abstracts on life sciences and biomedical topics as accessed by the engine PubMed.