

Description	Type	Course	Semester
43319 Cell and Tissue Therapies. Tissue Bank	OB	1	1

Module Head Teacher

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Use of languages

Principal working language: English (Eng)

Other comments on languages

Language will be English, although it is possible to do the communication in Spanish. The material will be in English.

Teachers

Irene Oliver: Graduate in Human Biology (Universitat Pompeu Fabra, 2004) and doctorate in the Department of Cell Biology, Immunology and Neuroscience (University of Barcelona, 2009). She has worked as researcher at the University of Barcelona. Nowadays she works in Banc de Sang at the Laboratory of Cell Therapy Development. She also contributes in the maintenance and supervision of BPL (Good Laboratory Practice).

Luciano Rodríguez: Graduate in Biochemistry with more than fifteen years of experience in the manufacture of human cells and tissues for clinical use. He is currently working as Qualified Person for Advanced Therapy Medicinal Products in BST. His background includes Procurement, Manipulation, Cryopreservation and Quality Control as well as Quality Management of Cell and Tissue Establishments.

Joaquim Vives: Graduate and PhD in Biochemistry, MSci in Biotechnology (UAB, Spain). He has focused his scientific activity, internationally both in industry and academy, in the development of bioprocesses for the generation of cell-based products for use in diagnostics and therapy. He did his post-doc in stem cell biology at the University of Edinburgh (Scotland), he was head of research of Stem Cell Sciences UK Ltd (Cambridge, UK), and visitor scientist at the Burnham Institute (La Jolla, US), ETH (Zurich, Switzerland) and Uni. Milano (Italy). Since 2008, he applies his expertise and knowledge to develop advance therapies in compliance with quality and regulatory requirements in his laboratory at Banc de Sang i Teixits in Barcelona.

Prerequisites

It is necessary to have a level B2 of English or equivalent.

Objectives and Contextualization

Cell therapy and basic concepts will be introduced to continue with the deepening of hematopoietic cell therapy, immunotherapy and regenerative medicine.

The module delves into cell banks, the cord bank, safety standards and accreditation of quality of bio-banks as well as regulation and ethical aspects.

Skills

- To have and understand the knowledge that provides a base or opportunity to be original in the development and/or application of ideas, often in a research context.
- That students know how to apply acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study.
- That students are able to integrate knowledge and face the complexity of making judgments based on information that, incomplete or limited, includes reflections on social and ethical responsibilities linked to the application of their knowledge and judgements.
- That students know how to communicate their conclusions and the latest knowledge and reasons that support them to specialized and non-specialized audiences in a clear and unambiguous way.
- That students have the learning abilities that allow them to continue studying in a self-directed or autonomous way.
- Apply the biological principles of the cellular therapies in the treatment of local and systemic pathological processes.
- Design and develop research with appropriate methodologies.

Learning outcomes

1. Identify different concepts on stem cell sources, donors and manipulations.
2. Integrate the basic concepts on stem cells biology.
3. To achieve a complete knowledge on HSC processing and clinical application.
4. Integrate the biological and technical basis of cellular immunotherapy and their clinical implications.
5. Describe the state-of-the-art of the different concepts of regenerative medicine.
6. Describe the different concepts and technical processes of cord blood banking.
7. Describe the different concepts and processes of tissue banking.
8. Describe biobank objectives, structure and management.
9. Develop coherent attitudes with the medical ethical code.

Content

1. Introduction to stem cell therapies.
2. General concepts on stem cell.
3. Hematopoietic stem cell (HSC) therapy.
4. Immunotherapy.
 - 4.1. General concepts.
 - 4.2. Immunotherapy with T lymphocytes.
 - 4.2.1. Donor lymphocyte infusions (DLI).
 - 4.2.2. Cytotoxic T lymphocytes (CTL).
 - 4.2.3. Regulatory T cells (Tregs).
 - 4.3. Natural killer cells (NK cells).
 - 4.4. Dendritic cells (DC).
 - 4.4.1. For T cells immunotherapy.
 - 4.4.2. Tolerogenic.
 - 4.5. Chimeric Antigen Receptor T Cells CAR-T Cells.
 - 4.6. Mesenchymal Stromal Cells (MSCs).
5. Cell therapy for tissue and organs repair, regenerative medicine and advanced therapies.

6. Cell banking: cord blood.
7. Tissue banking.
8. Biobanks.
9. Ethical issues of cell and tissue therapy and biobanks: Why does cell and tissue therapy need bioethics?

Methodology

This course will follow an active and constructive methodology. It is not the content but remember to read and reflect and apply knowledge to situations reasonably close, creating meaningful learning.

Thus, work on real-life examples and case studies, reflecting on complex situations and little structured in order to find appropriate solutions.

Faithful to the proposed methodology, students like you are the center of the learning process. Build knowledge significantly actively interacting with your peers, with training, with materials, with the environment. This program not only teaches about virtual training but also will live every day intensely from the experience.

At the beginning of the unit, the teacher will present to the board, including a proposal for planning learning with specific targets to be achieved in each of them with learning activities to be performed, the resources used and recommended dates for each work activity.

The dates for carrying out activities in nature are "recommended" to the proper tracking and use of the course. The only dates that are considered "immovable" are the beginning and end of UD. This means that students can follow their own planning as long as they respect the start and end dates.

It is recommended to try to operate continuously and do not let the tasks accumulate on date. For two basic reasons: firstly, accumulating tasks for a single date can lead to work in a hurry, overwhelmed by the time and not allow or enjoy learning or further reflections being carried out; moreover, the course provides activities in group dynamics, and to bring to fruition a cooperative work you need a minimum of temporal synchrony.

Some activities should be sent to the teacher so that they can be checked, along with you and your learning. Thus, the teacher will return your work commented so, together with him, you can continue reflecting and learning from each. The maximum deadline for these activities will be the final date of each UD. Other activities will be sharing, discussing and working together on shared spaces.

Activities

Title	Hours	ECTS	Learning outcomes
Type: Directed	38	1'52	
Moderated discussions through the Virtual Campus			1-9
Type: Supervised	131	5'24	
Virtual Case/Problem Solving			3, 4, 9
Elaboration of projects			5, 6, 7, 8
Type: Autonomous	206	8'24	
Test/Scheme			1-9
Personal study			1-9
Reading articles/Reports of interest/Videos			1-9

Evaluation

The Module will be evaluated through:

1. Moderated discussions through the Virtual Campus: Will suppose 20% of the final score.
2. Elaboration of projects, tests, virtual cases and problem solving: Will suppose 60% of the final score.
3. Personal study, Reading articles and reports of interest and/or videos: Will suppose 20% of the final score.

Evaluation Activities

Title	Weighting	Hours	ECTS	Learning outcomes
Exercise 1	7 %	25	1	2
Exercise 2	13 %	62'5	2'5	3
Exercise 3, 4	28 %	150	6	4
Exercise 5, 6	10 %	50	2	5
Exercise 7, 8	7 %	25	1	6
Exercise 9	7 %	25	1	7
Exercise 10	7 %	25	1	8
Exercise 11	3 %	12'5	0'5	9

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