

Fiche de renseignement AMETYS – UE

Nom de l'UE : Cell Therapies and tissue engineering (HAC919C9)

Onglet « Présentation »

Description* :

Support en anglais

This introductory courses is devoted to the most advanced alternative solutions to conventional medicines in two different fields : Cell therapy and tissue engineering.

The first part is devoted to cell used as drugs, from its basic understating to the problem raised for its large scale production. It is detailed as followed:

Stem cells and regenerative medicine 1.5h

Cells, a new category of drugs: advanced therapy medicinal products (ATMP).

Design and therapeutic use of chimeric antigen receptor engineered cells (CART-T cells).

Regulatory aspects 1h

- Pluripotent stem cells and their applications 2h

- Hematopoietic stem cells 1,5h

- Organoids: 1.5h

Clinical trial methodology applied to ATMP 1.5h

The second part of the course is focused on tissue engineering and regenerative medicine, associated with 3D biofabrication. It is detailed as followed:

-basics of biofabrication and bioprinting

- 3D printing in the medical field. Application to cartilage regeneration 1.5h

- Scaffolds for tissue engineering

- 3D printers for bio-printing

- design of bio-inks

Key words: Organoids, Cell therapy, ATMP, bio-manufacturing, biomaterials, bio-inks, 3D printing, regenerative medicine

Objectives:

(i) Acquisition of general knowledge about cell based therapies and tissue engineering to identify the main challenges and technological opportunities in their design, production and administration. (ii) Be able to select a scaffold, a bioink and a 3D printing method for a tissue engienenring application. (iii) be able to design a new bioink, synthesizing the molecular precursors or functionalizing (bio)polymers.

The course will focus on organic chemistry and post-functionalization of biomolecules applied to peptides, proteins and nucleic acids (DNA and RNA) with applications in gene therapy, biosensing and design of probes for biological studies.

Volumes horaires* :

CM : 15 H

TD : 5 H

TP :

Terrain :

Pré-requis nécessaires* :

Organic Chemistry level Master 1

Pré-requis recommandés* :

Knowledge in the synthesis and function of major biomolecules

Syllabus :

Cours : 15H

Lectures will be given by researchers and specialists in the field including:

- John DeVos
- Said Assou
- Danièle Noël
- Jean-Luc Veyrone
- Christian Jorgensen

1.

TD : 5H

The concepts presented in a lecture style format will be reinforced through classroom discussion of articles from scholarly journals, presented and discussed by students. Students will visit the Cartigen Platform and will learn to use 3D printers for scaffold bioprinting.

Onglet «Contacts »

Responsables* :

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