PhD Advanced Course

Stem Cell Technologies

October 19-23, 2020

Online Course through the Zoom Platform (synchronous)

Course Coordinators:
Susana Solá, Faculty of Pharmacy, University of Lisbon
Christa Rhiner, Champalimaud Foundation

Course Organizers:
Faculty of Pharmacy, University of Lisbon
Joana Miranda
Joana Amaral
Rui Castro
Cecília Rodrigues,

Faculty of Medicine, University of Lisbon
Sara Xapelli

Champalimaud Foundation
Christa Rhiner
Adriana Sánchez-Danés

Short Introduction

Stem cell-based therapies are thriving. In fact, pharmaceutical companies are increasingly investing in stem cell technology to develop innovative and potentially valuable new treatments for severe human diseases, including cancer and neurological disorders, such as multiple sclerosis, Alzheimer´s and Parkinson´s disease, mood disorders, brain tumors and even stroke. Moreover, although seminal advances have occurred in understanding stem cell biology, further work is still needed to bridge the current gap between stem cell technologies and effective treatments in brain-related disorders. Stimulating the scientific interest on the topic will certainly accelerate and improve the successful transfer of stem cell-based discoveries from the bench to the bedside.

Goals and Learning Outcomes

The overall goal of the Stem Cell Technologies course is to train a new generation of researchers with the knowledge necessary to understand stem cell plasticity and consider innovative stem cell-based strategies for the treatment of a range of devastating disorders.

Specific competencies will be acquired to:

- Understand the biology of stem cells, and their role in tissue homeostasis, cancer and regeneration;
- Discuss their potential in biomedical research and the challenges of developing better stem cell-based therapies;
- Recognize cutting-edge stem cell tools and models to tackle human disease;
- Understand how pharmacology, toxicology and biomedical applications benefit from emerging scale-up stem cell technologies.

Assessment

Assessment will be based on the active participation in the seminars and workshops.
The last workshop on Stem Cell-based business concepts will be an interactive forum in groups, where students will explain and discuss the technology and application of two biotechnology companies with stem-cell based concepts.

Registration and Fees

The registration is made through the **FenixEdu Platform** until October 14, 2020.

- Registration with evaluation: 125€
- Registration without evaluation: 100€

This course is free for 1st year PhD students of FFUL Doctoral Program.

PROGRAMME

Stem Cell Technologies

MONDAY – 19 October

Stem Cells in Tissue Homeostasis and Cancer
Moderator: Sara Xapelli, iMM, Universidade de Lisboa

09h00 **Welcome**
Course organizers

09h30 **Stem Cell properties and tissue homeostasis**
Adriana Sánchez-Danés
Campalimaud Foundation, Lisbon, Portugal

10h30 **Different types of adult stem cells in Drosophila: A fly perspective**
Christa Rhiner
Champalimaud Foundation, Lisbon, Portugal

11h30 **Break**

12h00 **Stem cells in esophageal cancers and metaplasia**
Benjamim Beck
Université Libre de Bruxelles, Belgium

13h00 **Lunch break**

14h30 **Tackling cancer stem cells for anti-cancer therapies**
Joana Paredes
IPATIMUP, Porto, Portugal

16:00 **Cancer stem cells and tumor heterogeneity**
Adriana Sánchez-Danés
Campalimaud Foundation, Lisbon, Portugal

TUESDAY – 20 October

Stem Cells in Disease Modelling and Drug Discovery
Moderator: Joana Miranda, iMed.ULisboa, Universidade de Lisboa

9h30 **Mitotic fidelity in pluripotent stem cells**
Inês Milagre
IGC, Oeiras, Portugal

10h30 **Cannabinoid actions on adult neural stem cells: implications for pathophysiology**
Sara Xapelli
iMM, Lisbon, Portugal

11h30 **Break**

12h00 **Working group guidelines**
Research for companies with stem-cell based concepts
Presentations will be on Friday

13h00 **Lunch break**

14h30 **Workshop:**
Translation of tissue engineering products into clinic: practical examples of research developments bridging the gap between benchtop and bedside
Juliana Martinez-Atienza
Andalusian Network for the Design and Translation of Advanced Therapies, Sevilla, Spain

WEDNESDAY – 21 October

Engineering Stem Cells
Moderator: Adriana Sánchez-Danés, Champalimaud Foundation

9h30 **Scalable manufacturing of stem cell-based therapies**
Claudia Lobato
IBB, IST, Lisbon, Portugal

10h30 **3D cell culture strategies for enhanced cell therapies**
Joana Miranda
iMed.ULisboa, Lisbon, Portugal

11h30 **Break**

12h00 **Stem cells secretome in CNS regenerative medicine**
António Salgado
ICVS/3B´s, UMinho, Braga, Portugal

13h00 **Lunch break**

14h30 **Workshop:**
Benefits and risks of stem cell-based therapies
Christa Rhiner and Susana Solá
iMed.ULisboa and Champalimaud Foundation, Lisbon, Portugal

THURSDAY – 22 October

Stem Cells in Neurological Disorders
Moderator: Joana Amaral, iMed.ULisboa, Universidade de Lisboa

9h30 **Diet and metabolic regulation of adult neurogenesis**
Susana Solá
iMed.ULisboa, Lisbon, Portugal

10h30 **Neural stem and progenitor behaviours: lessons from flies**
Rita Sousa-Nunes
Centre for Developmental Neurobiology, London, England

11h30 **Break**

12h00 **Developing a stem cell based therapy for Parkinson's disease**
Malin Parmar
Wallenberg Neuroscience Center, Lund University, Sweden

13h00 **Lunch break**

14h30 **Work group / Self-study**

FRIDAY – 23 October

Emerging Clinical Stem Cell Technologies
Moderator: Cecília Rodrigues, iMed.ULisboa, Universidade de Lisboa

09h30 **Organoids and organ-on-chip models for biomedical applications**
William Roman
iMM, Lisbon, Portugal

10h30 **Advanced stroke therapies: targeted recovery through the BBB**
João Sargento Freitas
CNC, University of Coimbra and Hospital da Luz de Coimbra

11h30 **Break**

12h00 **Industrialization of pluripotent stem cell-based therapies: challenges and bioprocessing solutions**
Márcia Mata
Catapult, UK

13h00 **Lunch break**

14h30 **Workshop: Stem Cell-based business concepts**
Student presentations and discussion round

End of course