Stem Cell Technologies

PhD Advanced Course

November 8-12, 2021

ECTS: 6; Classes 22.5 hours

Online Course through the Zoom Platform (synchronous)

Course Coordinators:
Susana Solá, Faculty of Pharmacy, Universidade de Lisboa
Christa Rhiner, Champalimaud Foundation

Organizing Committee:
Faculty of Pharmacy, Universidade de Lisboa
Joana Miranda
Joana Amaral
Rui Castro
Cecília Rodrigues
Susana Solá

Faculty of Medicine, Universidade de Lisboa
Sara Xapelli

Champalimaud Foundation
Christa Rhiner
Adriana Sánchez-Danés

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

This course is free for 1st year PhD students of FFUL and Champalimaud Foundation

For other attendees, the registration is made through the **FenixEdu Platform** until November 1, 2021.

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

PROGRAMME

MONDAY – 8 November

Stem Cells in Disease Modelling and Drug Discovery

Moderator: Joana Miranda, iMed.ULisboa, Universidade de Lisboa

09h00	**Welcome and Working group guidelines** Course organizers
9h30	**Core concepts in stem cell regulation and clinical potential** Susana Solá iMed.ULisboa, Lisbon, Portugal
10h30	**Cannabinoid actions on adult neural stem cells: implications for pathophysiology** Sara Xapelli iMM, Lisbon, Portugal
11h30	**Break**
12h00	**Neural stem and progenitor behaviours: lessons from flies** Rita Sousa-Nunes Centre for Developmental Neurobiology, London, England
13h00	**Lunch break**

14h30 **Targeting liver cancer stem cells for the treatment of hepatocellular carcinoma**
Rui Castro
iMed.ULisboa, Lisbon, Portugal

15h30 **End of the day**

TUESDAY – 9 November

Stem Cells in Tissue Homeostasis and Cancer

Moderator: Rui Castro, iMed.ULisboa, Universidade de Lisboa

09h30 **Stem cells, cancer stem cells and tumor heterogeneity**
Adriana Sánchez-Danés
Campalimaud Foundation, Lisbon, Portugal

10h30 **Drosophila adult stem cells in tissue homeostasis and regeneration**
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**

Moderator: Adriana Sánchez-Danés, Champalimaud Foundation

14h30 **Rejuvenating strategies for stem cell-based therapies in aging**
Pedro Vitór
iMM, Lisbon, Portugal

15h30 **Working group and self-study**

16h30 **End of the day**

WEDNESDAY – 10 November

Engineering Stem Cells

Moderator: Sara Xapelli, iMM, Universidade de Lisboa

9h30 **Scalable manufacturing of stem cell-based therapies**
Cláudia 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:**
Biomaterial-based strategies for stem cell engineering and regenerative medicine applications
João Silva and Paola Alberte
IBB, IST, Lisbon, Portugal

16h30 **End of the day**

THURSDAY – 11 November

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 **TBA**
Jonas Frisén
Karolinska Institutet, Stockholm, Sweden

11h40 **Break**

12h00 **Human adult hippocampal neurogenesis during physiological and pathological aging**
Maria Llorens Martin
Centro de Biología Molecular 'Severo Ochoa', Madrid, Spain

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

16h30 **End of the day**

FRIDAY – 12 November

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 **Patient-derived stem cells and organoids in ocular disease modeling and regenerative medicine**
Sayan Basu
Stem Cell Clinic, Hyderabad, India

11h30 **Break**

12h00 **Cell therapies for Covid-19**
Francisco dos Santos
Crioestaminal, Oeiras, Portugal

13h00 **Lunch break**

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

16h30 **End of the day**

End of course