PhD Advanced Course - Advances in Neuropathology and Innovative Therapeutic Interventions
2-16 de September de 2024
ECTS: 6
Hybrid Course at FFULisboa/FMULisboa and through the Zoom Platform (synchronous). Sessions concerning group work, case-study discussions and pitch presentations will occur on site, at FFULisboa.

Course Coordinators: Adelaide Fernandes, Faculdade de Farmácia, Universidade de Lisboa, and Sandra Vaz, Faculdade de Medicina, Universidade de Lisboa

Course Organizers:
Adelaide Fernandes, Faculdade de Farmácia, Universidade de Lisboa
Ana Rita Vaz, Faculdade de Farmácia, Universidade de Lisboa
Andreia Barateiro, Faculdade de Farmácia, Universidade de Lisboa
Maria Alexandra Brito, Faculdade de Farmácia, Universidade de Lisboa
Mariana Neuparth-Sottomayor, Faculdade de Medicina, Universidade de Lisboa
Rui Silva, Faculdade de Farmácia, Universidade de Lisboa
Sandra Vaz, Faculdade de Medicina, Universidade de Lisboa
Tatiana Morais, Faculdade de Medicina, Universidade de Lisboa

Teaching staff:
Course organizers and Invited speakers as detailed in programme

Short Introduction

Neuropharmaceutics focuses on the identification of therapeutic targets in nervous system diseases, and then translating those discoveries into drug and therapy development. Neurological disorders have a crucial impact on our society accounting for increased health costs, while drug development to central nervous system (CNS) disorders represents the second investment priority of the pharmaceutical industry, following cancer. Thus, advances in neuropharmaceutics is a key area for students of a PhD programme aiming to target discovery, drug design, medicine development and usage.
The course intends to improve PhD students' knowledge in the discovery of potential CNS-disease targets leading to the development of new neuroactive drugs, and the improvement of methods to deliver those drugs to the brain, under restricted safety and efficacy requirements.

Goals and Learning Outcomes

Development of new medicines to treat prevalent and emerging neurological conditions is a state-of-the-art research field. This course will cover the most relevant areas of study in the neuroscience field, highlighting the new advances in CNS targeting and discussing innovative medicines and current clinical trials. Students will have the opportunity to enrich their education in the major concepts needed for innovation and entrepreneurism in drug development within the neuroscience area. They will also contact with advanced in vitro or in vivo systems, as well as human sample analysis used to discover new targets and/or assay potential neuropharmaceutical strategies. At the end of the course the PhD students must be able to demonstrate an integrated knowledge concerning the multidisciplinarity of neuropharmaceutics and be able to design a new therapeutic strategy to fulfill a specific unmet need of a neurological disorder.

Assessment

The students attending the course will be evaluated along the week based on their participation in seminars and workshop discussion, involvement in case-study debate and preparation/ presentation of a scientific project in an Impact-to-Research Canvas model. The project should describe the design of a new therapeutic strategy to fulfill a specific unmet need of a given neurological disorder, using a multidisciplinary and advanced approach with scientific and social impact. The students will have to fill-in a pre-designed 1-page template of Research-to-Impact Canvas, an innovative adaptation of the Business Model Canvas to be used by researchers. This planning tool will encourage the students to think about the usefulness of their research, in conjunction with their knowledge transfer and/or implementation plan with income revenue. Upon pitch presentation of their project, the students will submit a 2-page report for final project description. Students will have a workshop on the "Guidelines for preparation of assignment", will benefit from group discussion slots and a pitch presentation of their idea, followed by brief discussion prior to project writing.

Registration and Fees

This course is free for 1st year PhD students of FFULisboa.
For other attendees, the registration is made through the FenixEdu Platform until August 26, 2024.

- Registration with evaluation: 150€
- Registration without evaluation: 125€

PROGRAMME

MONDAY – September 2nd

9h00 **Welcome**
Course organizers

Cognitive and Behavioural Neuroscience
Moderator: Alexandra Brito, FFULisboa

9h30 **Treatments for cognitive dysfunction: An overview**
João Cerqueira
ICVS - Life and Health Sciences Research Institute, School of Medicine, Universidade do Minho, Braga, Portugal

10h30 **Impact of adult hippocampal cytogenesis for brain circuitry and behavior in depression**
Luisa Pinto
ICVS - Life and Health Sciences Research Institute, Universidade do Minho, Braga, Portugal

11h30 **Break**

12h00 **Early-life allergies as a risk factor for Attention-Deficit/Hyperactivity Disorder: from mouse to human studies**
Joana Guedes
Center for Neuroscience and Cell Biology, Universidade de Coimbra, Coimbra, Portugal

13h00 **Lunch Break**

14h00 **Guidelines for preparation of assignment –** Adelaide Fernandes
iMed.ULisboa, Faculty of Pharmacy, Universidade de Lisboa, Lisboa, Portugal

TUESDAY – September 3rd

Neurodegeneration and Neuroregeneration
Moderator: Rui Silva, FFULisboa

9h30 **TBA**
António Salgado
ICVS, School of Medicine, Universidade do Minho, Braga, Portugal

10h30 **TBA**
Inês Araujo
Algarve Biomedical Center Research Institute (ABC-RI), Neurogenesis Lab, and Faculty of Medicine and Biomedical Sciences (FMCB), University of Algarve

11h30 **Break**

12h00 **Chronic stress and exosomes in precipiating and diagnosis of Alzheimer's disease**
Ioannis Sotiropoulos
ExoBrain - Laboratory of Brain Exosomes & Pathology, Institute of Biosciences & Applications, NCSR "Demokritos", Greece & ICVS, School of Medicine, University of Minho, Braga, Portugal

13h00 **Lunch Break**

Workshop – Electrophisiological recordings: old techniques to answer innovative questions – at FMULisboa
Moderator: Sandra Vaz, FMULisboa

14h00 **Lecture: Relevance of Electrophysiologica recordings: from *in vitro* to *in vivo***
Sandra Vaz
iMM/FMULisboa

15h00 **Workshop: Patch-clamp, field excitatory postsynaptic recordings and EEG recordings**
Sandra Vaz (iMM/FMUL) and Mariana Neuparth-Sottomayor (iMM/FMUL)

WEDNESDAY – September 4th

Neuro-immunology
Moderator: Ana Rita Vaz, FFULisboa

9h30	**Neuronal regulation of immune fitness** Henrique Veiga-Fernandes *Champalimaud Foundation, Lisboa, Portugal*
10h30	**Born to be a phagocyte: Developmental maturation of microglial phagocytosis efficiency** Amanda Sierra *Achucarro Basque Center for Neuroscience, Bizkaia, Spain*
11h30	**Break**
12h00	**Microbiome in Neurological disorders: A player and a target?** David Otaegui Bichot *Biogipuzkoa Health Research Institute, San Sebastián, Spain*
13h00	**Lunch Break**
14h00	**Case-study discussion** Moderators: Adelaide Fernandes, FFULisboa & Sandra Vaz, FMULisboa

THURSDAY – September 5th

Central Nervous System targeting
Moderator: Tatiana Morais, FMULisboa

9h30 **Nano-immunotherapies regulating brain immunity**
Helena Florindo
Faculdade de Farmácia, Universidade de Lisboa, Lisboa, Portugal

10h30 **Blood Brain Barrier: challenges to develop new therapeutic tools to act in the brain**
Vera Neves
Lisbon School of Medicine and IMM, Lisboa, Portugal

11h30 **Break**

12h00 **Gene therapy for brain disorders**
Luis Pereira de Almeida
CNC - Center for Neuroscience and Cell Biology, CIBB - Center for Innovative Biomedicine and Biotechnology, GeneT - GeneTherapy Center of Excellence Faculdade de Farmácia, Universidade de Coimbra, Coimbra, Portugal

13h00 **Lunch Break**

Workshop – Advanced models for target discovery and neuropharmaceutic screening assays – at FFULisboa
Moderator: Adelaide Fernandes (FFULisboa) & Andreia Barateiro (FFULisboa)

14h00 **hIPSCs, microglia and brain organoids: advanced in vitro models to study neurological disorders**
Ana Luisa Cardoso
Center for Innovative Biomedicine and Biotechnology, Universidade de Coimbra, Coimbra, Portugal

15h00 **iPSC-derived Brainspheres as a new 3D human mini-brain model**
Catarina Barros
iMed.ULisboa, Faculdade de Farmácia, Universidade de Lisboa, Lisboa, Portugal

FRIDAY – September 6th

Innovation in neuropharmaceutics
Moderator: Adelaide Fernandes, FFULisboa & Sandra Vaz, FMULisboa

9h30 **Pharma vignettes of neuroscience pipeline/portfolio**

Reimagining Neuroscience through Research: Novartis Innovative Medicines Vision
Vânia Martins
Medical Manager Neurosciences, Novartis Portugal

Biogen Neuroscience Applications
Rita Lau
Regional Medical Head Biogen Intercontinental Region

11h00 **Break**

11h30 **Round Table**
Academia/Clinical Research
Carlos Capela
Neurologist and Diretor Centro de Responsabilidade Integrado de Esclerose Múltipla, Hospital de Santo António dos Capuchos and Centro Hospitalar Universitário de Lisboa Central (CHULC), Lisboa, Portugal

Regulatory affairs
João Rocha
iMed.ULisboa, Faculty of Pharmacy, Universidade de Lisboa, Lisboa, Portugal

Patient association
Paulo Gonçalves
União das Associações das Doenças Raras de Portugal – DR-Portugal

13h00 **Lunch Break**

14h00 **Case-study Examples presentation and discussion**
Moderators: Adelaide Fernandes, FFULisboa & Sandra Vaz, FMULisboa

MONDAY – September 9th

Tutorial
Moderator: Adelaide Fernandes, FFULisboa & Sandra Vaz, FMULisboa

14h00	**Group work** Group discussion with organizing committee and development of students' case-study assignment

FRIDAY – September 13th

Students' presentation
Moderator: Adelaide Fernandes, FFULisboa & Sandra Vaz, FMULisboa

14h00	**Workshop – Research to Impact Canvas pitch presentation** - Students Moderators: Adelaide Fernandes, FFULisboa & Sandra Vaz, FMULisboa