



PhD Advanced Course

Molecular Biomarkers and Technologies

14-18 September 2020

Online Course through Zoom Platform (synchronous)

Course Coordinator:

Cecília Rodrigues, Faculty of Pharmacy, University of Lisbon

Course Organizers:

Faculty of Pharmacy, University of Lisbon

Cecília Rodrigues

Adelaide Fernandes

Elsa Rodrigues

Paula Leandro

Rui Castro

Susana Solá

Short Introduction

Biomarkers are now an integral part of the drug discovery and development process, acting as indicators of drug mechanism of action, efficacy, safety and disease progression, as well as assisting in disease diagnosis, patient selection and clinical trial design. Biomarkers also offer the potential to inform treatment decisions and bring personalized medicine into clinical practice.

Latest advances in clinical and translational biomarkers will be covered, including patient selection and predicting response to therapy, liquid biopsy and cell free DNA, companion diagnostics and personalized medicine, biomarker assay development and validation, and biomarker-based clinical trials. The new frontier of digital health and its impact on drug and diagnostic development will be explored, covering emerging digital biomarkers and their utility in clinical trials, advances in biosensors and wearables as clinical endpoints, integration of mobile health into drug development, and the latest applications in point-of-care testing and remote patient monitoring.

The training program is aimed at PhD students, but welcomes the participation of external academic and scientific community members.

Goals and Learning Outcomes

This course is designed to cover principles and applications of biomarkers and technologies, from identification to validation, to impact in drug discovery, and disease diagnosis, prognosis and treatment.

The following learning outcomes are expected:

- Apply on-target cellular readouts to support drug discovery and development programmes;
- Understand efficacy and safety biomarker assays in model systems;
- Explore biomarker formats ranging from nucleic acids, proteins and metabolites to phenotypic changes;
- Comprehend technological and methodological platforms for identification and validation of candidate biomarkers for translational and back-translational studies.

Assessment

Assessment of the course consists in the preparation and submission of a **2-page long letter of intent (LOI)** for a research project. Students are grouped to build multidisciplinary teams. Each group works throughout the week on a research project that should reflect the topic of the course, including methodologies and strategies to solve an innovative research question. The project is expected to adhere to the following general structure: a) Title; b) Conceptual hurdle and innovative idea to be tested; c) Plan and methods; d) Relevance (scientific and social impact).

The students will select a broad topic of research and are expected to propose a specific project. The resulting LOI will be evaluated according to the following criteria and weight: a) Novelty and relevance (30%); b) approach to the problem (30%); c) multidisciplinary approach of the research plan (40%).

Registration and Fees

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

For other attendees, the registration is through the **FenixEdu Platform** until **September 9, 2020**.

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

PROGRAMME

Molecular Biomarkers and Technologies

MONDAY – 14 September

Moderator: Adelaide Fernandes, University of Lisbon

Opening

10:00 Molecular mediators of the benefits of exercise as potential biomarkers and therapeutics

Jorge Ruas, Karolinska, Stockholm, Sweden

11:00 Neuronal regulation of immune fitness

Henrique Veiga Fernandes, Champalimaud, Lisbon, Portugal

12:00 Cellular and molecular aspects of tumor immunology

Lorenzo Galluzzi, Weill Cornell, NY, USA

TUESDAY – 15 September

Moderator: Rui Castro, University of Lisbon

10:00 Metabolomics: a powerful tool in health

Teresa Cardoso Delgado, CIC bioGUNE, Bilbao, Spain

11:00 Patient derived organoids: a novel tool to model biliary cancers and implement personalized therapy

Chiara Braconi, University of Glasgow, Scotland

12:00 Extracellular vesicles: from cell-cell communication to biomarkers discovery

Bruno Costa-Silva, Champalimaud, Lisbon, Portugal

14:00 Workshop: Ethics and research

Mara de Sousa Freitas, Lisbon, Portugal

WEDNESDAY – 16 September

Moderator: Susana Solá, University of Lisbon

10:00 Systems biology approaches identify host microRNAs controlling infection by bacterial pathogens

Ana Eulálio, CNC & Department of Life Sciences, University of Coimbra

11:00 Advanced technological approaches to develop innovative cancer immunotherapy

Helena Florindo, iMed.Ulisboa, Portugal

12:00 Chemical biology

Gonçalo Bernardes, IMM, Lisbon, Portugal

14:00 Workshop: Communication

Sofia Sá, IST, University of Lisbon, Portugal

THURSDAY – 17 September

Moderator: Elsa Rodrigues, University of Lisbon

10:00 Exploring high-throughput screening as a functional genomics tool in biomedicine

Miguel Mano, CNC & Department of Life Sciences, University of Coimbra

11:00 Epigenetics and epigenomics in personalized cancer medicine

Manel Esteller, Director of Josep Carreras Leukaemia Research Institute (IJC), ICREA Research Professor and Genetics Chairman, School of Medicine, University of Barcelona

12:00 The 100,000 Genomes Project: Technology transforming healthcare

Mark Caulfield, Professor Sir Mark Caulfield MD FRCP FESC FBHS FMedSci, NIHR Barts Biomedical Research Centre, London, UK

14:00 Workshop: How to write a research project

Cecília Rodrigues, iMed.Ulisboa, Faculty of Pharmacy, University of Lisbon, Portugal

FRIDAY – 18 September

Moderator: Cecília Rodrigues, University of Lisbon

10:00 Digital biomarkers: healthcare trends

Hugo Ferreira, Lisbon, Portugal

11:00 Towards the use of speech as a health biomarker

Alberto Abad, INESC-ID, University of Lisbon, Portugal

12:00 The evolution of influenza viruses and host immune responses

Colin Russell, Amsterdam AMC, Netherlands

End of course