



## **Molecular Biomarkers and Technologies**

**PhD Advanced Course**

**20-24 September 2021**

**ECTS: 6; Classes: 22.5 hours**

**Course Coordinator: Cecília Rodrigues**

Organizing Committee: Elsa Rodrigues, Joana Amaral, Cecília Rodrigues

### **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. This online-only event gives you the opportunity to interact with esteemed scientists in the field without having to spend much time away from the lab. Our aim is to facilitate connections, spark new insights, and pave the way for cross-disciplinary collaborations by creating an engaging, highly interactive forum.

### **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 on a research project that should reflect the topic of the course, including tools 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 1<sup>st</sup> year PhD students of FFUL Doctoral Program. For other attendees, the [registration](#) is through the FenixEdu Platform until September 16, 2021.

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

## Programme

### MONDAY – 20 September

**9:45 Opening remarks**

**Opening lecture**

**10:00 Title**

*Paula Alves (TBC), iBET, Universidade NOVA de Lisboa*

### **BIOMARKERS IN NEUROSCIENCES**

Moderator: Elsa Rodrigues, FFUL

**11:00 Title**

*Luis Almeida, CNC, Faculdade de Farmácia, Universidade de Coimbra*

**12:00 Biomarkers and technologies in Biomedical Neuroscience**  
*Diana Prata, IBEB, Faculdade de Ciências, Universidade de Lisboa*

**Lunch**

**14:00 Workshop: Bioentrepreneurship**  
Moderator: Susana Solá, FFUL  
**Title**  
*Rita Tomé, Tec Labs, Faculdade de Ciências, Universidade de Lisboa*  
**Title**  
*Bruno Silva-Santos, GammaDelta Therapeutics, IMM, Universidade de Lisboa*

## TUESDAY – 21 September

### **BIOMARKERS IN CANCER**

Moderator: Marta Afonso, FFUL

**9:00 Intercellular communication and cancer**  
*José Carlos Machado, Ipatimup, i3S, Faculdade de Medicina, Universidade do Porto*

**10:00 Digital pathology**  
*Catarina Eloy, IPATIMUP, i3S, Faculdade de Medicina, Universidade do Porto*

**11:00 Biosensors for screening molecular biomarkers**  
*Goreti Sales, Faculdade de Ciências e Tecnologia, Universidade de Coimbra*

**Lunch**

**14:00 Workshop: Ethics**  
Moderator: Rui Castro, FFUL  
**Ethics in science and Technologies**  
*Ana Sofia Carvalho, Consultant, Universidade Católica, Porto*

## WEDNESDAY – 22 September

### **BIOMARKERS IN INFECTION**

Moderator: André Santos, FFUL

**10:00 New paradigms in virology**  
*Maria João Amorim, IGC, Oeiras*

**11:00 Bacterial genomic markers for drug resistance and molecular epidemiology: gaining insight on *Mycobacterium tuberculosis* dissemination and resistance acquisition dynamics**  
*João Perdigão, iMed.Ulisboa, Faculdade de Farmácia, Universidade de Lisboa*

**12:00 Title**  
*Miguel Prudêncio, IMM, Universidade de Lisboa*

**Lunch**

**14:00 Workshop: Science Communication**  
Moderator: Joana Amaral, FFUL  
**Science journalism**  
*António Granado, Faculdade de Ciências Sociais e Humanas, Universidade NOVA de Lisboa*

## Public engagement with science

*Pedro Ferreira, Biochemical Society, London, UK*

### THURSDAY – 23 September

#### **BIOMARKER TECHNOLOGIES**

Moderator: Cecília Rodrigues, FFUL

**9:00 Title**

*Elvira Fortunato, FCT, Universidade NOVA de Lisboa*

**10:00 Pharmacogenetics**

*Ana Teresa Freitas, HeartGenetics, Genetics and Biotechnology SA, IST,  
Universidade de Lisboa*

**Break**

**11:30 Stem cells in development, homeostasis and cancer**

*Adriana Sánchez Danés, Champalimaud, Lisboa*

**Lunch**

**Closing lecture**

**14:00 Title**

*Francisco Quintana, Ann Romney Center for Neurologic Diseases, Brigham  
and Women's Hospital, Harvard Medical School, Boston, USA*

**15:00 Group discussion: Final projects**

### FRIDAY – 24 September

**10:00 Group discussion: Final projects**

Assessment

**12:00 Closing remarks**