



Molecular Biomarkers and Technologies

PhD Advanced Course

20-24 September 2021

22.5 hours and 6 ECTS; online-only event

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 1st 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 Molecular signatures by omics technologies

Patrícia Alves, iBET, Universidade NOVA de Lisboa

BIOMARKERS IN NEUROSCIENCES

Moderator: Elsa Rodrigues, FFUL

11:00 Biomarker discovery in neurodegenerative diseases

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
Entrepreneurship & Innovation
Rita Tomé, Tec Labs, Faculdade de Ciências, Universidade de Lisboa
Bioentrepreneurship in immuno-biology and immuno-oncology
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 Whole-organism vaccination against malaria
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 Low cost paper based platforms for biosensing applications

Elvira Fortunato, FCT, Universidade NOVA de Lisboa

10:00 Pharmacogenetics in clinical practice

*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 Characterization of signaling pathways that control the activity of the immune system

*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