

## 5<sup>th</sup> TRAINING COURSE, COST ACTION 17-112 PRO EURO DILI NET

### Advance course | Novel Challenges in Toxicology

September 27-29, 2022

The course will be held at FFUL in a hybrid-mode, with both in-person and virtual lectures (zoom platform).

**Course Coordinators:** Joana Miranda  
Nuno Oliveira

**Location:** Main building, amphitheater B

**ZOOM link:** <https://videoconf-colibri.zoom.us/j/99669641385>

#### Goals and Learning Outcomes:

Toxicological concepts are of utmost importance for all steps involved in drug discovery & development. Moreover, the new challenges associated with Toxicology are determinant for many other aspects of the biomedical sciences. By the end of this course it is expected that the students integrate the acquired knowledge towards complex toxicological phenomena and understand the impact of Toxicology in our modern society.

It is also expected that the students understand the adverse effects associated with the exposure of toxic xenobiotics from different classes and modes of action (MoA) as well as the inter-individual variations in biotransformation enzymes and membrane transporters, including the importance of genetic polymorphisms. Particular attention will be devoted to genotoxicity issues and their impact in carcinogenesis and in drug development. Safety issues in novel medicines, including biologicals, will also be highlighted.

Moreover, the application and translation of advanced *in vitro* models (e.g. 3D cellular models) in the drug development process in the research and industry will be a key topic of the advanced course. Finally, the students should also understand the role of the *Omic*s and potential of stem cell technology in predictive toxicology towards personalization.

# PROGRAMME

TUESDAY – 27<sup>th</sup> September

9h30-10h| **Opening Session**

[Nuno Oliveira](#) and [Joana Miranda](#)

## **Module 1: Toxicology concepts and challenges**

### 1. Overview of key concepts, applications, and challenges of toxicology

10h-11h| [Nuno Oliveira](#), FFUL, PT

11-11h30| **Coffee Break**

### 2. Mechanisms of target and non-target organ toxicology

11h30-12h30| Drug-Induced liver injury: towards precision medicine

*Raúl Andrade, Univ. Malaga, ES*

12h30-13h30| Cytochrome P450 enzymes in xenobiotic metabolism and their role in chemical genotoxicity.

*Michel Kranendonk, NOVA Medical School/UNL, PT*

13h30-15h| **Lunch break**

### 3. Applied toxicology in pharmaceutical sciences

15h-16h| Redox toxicology

[Ana S. Fernandes](#), Univ. Lusófona, PT

16h-17h| Food and environmental toxicology: from xenobiotics exposure to cancer.

*António Sebastião Rodrigues, NOVA Medical School/UNL, PT*

WEDNESDAY – 28<sup>th</sup> September

**Module 2: Emerging technologies in toxicology**

1. Advanced models in toxicology

9-10h| 3D liver models for drug metabolism and toxicology studies

*Joana Miranda, FFUL, PT*

10-11h| Development of Zebrafish Models for studying DILI

[Ozlen Konu](#), *Bilkent University, TK*

11-11h30| **Coffee Break**

2. Stem cell toxicology

11h30-12h30| Generation of functional liver cells from human induced pluripotent stem cells for toxicological applications

*Pau Sancho-Bru, FCRB-CERCA, ES*

12h30-13h30| Eye-on-chip in vitro platforms for drug development

[Madalena Cipriano](#), *Faculty of Medicine, Univ. Tübingen, DE*

13h30-14h30| **Lunch break**

3. Systems toxicology: the “omics” era

15h30-16h30| Omics-technologies applied to exosomes and body fluids for biomarkers identification in toxicology.

[Juan M. Falcon-Perez](#), *CIBERehd, ES*

16h30-17h30| Advances in predictive toxicology

[Christopher Goldring](#), *Univ. of Liverpool, UK*

## THURSDAY – 29<sup>th</sup> September

### Cont. Systems toxicology: the “omics” era

9-10h| Systems toxicology: Cellular stress responses and prediction of adverse drug responses

*Bob Van Der Water, Leiden University, NL*

### **Module 3: Impact of Toxicology in the new era**

#### 1. Safety issues in novel medicines

10-11h| Regulatory acceptance of 3R methods for non-clinical testing of human medicinal products: challenges and opportunities.

[Sonja Beken](#), FAMHP, BE

11-11h30| **Coffee Break**

11h30-12h30| Regulatory toxicology

[Beatriz S. Lima](#), FFUL, PT

12h30-14h| **Lunch break**

#### 2. Milestones of toxicology and contemporary issues

14h-15h| New insights on the bioavailability of xenobiotics

[Fernando Remião](#), FFUP, PT

15h-16h| Occupational exposure and human biomonitoring

[João P. Teixeira](#), INSA, PT

16h-17h| Impact of toxicology in modern society

[Félix Carvalho](#), EUROTOX & FFUP, PT

17h-17h30| Guidelines for learning assessment & closing session

*Nuno Oliveira and Joana Miranda*

**Learning Assessment:**

Preparation and submission of an extended abstract in which the trainee is invited to address an emerging issue/challenge considered determinant for the development of toxicology or, in alternative, a pertinent concern related to a toxicological event going on in our days. The work will be done individually and should include not only the scientific background but also an opinion on the chosen topic.

The proposed work with a limit of 1 to 3 A4 pages written in Arial font size 11 and 1.5 spacing (including references) should be sent in a PDF format to [jmiranda@ff.ul.pt](mailto:jmiranda@ff.ul.pt) and [ngoliveira@ff.ul.pt](mailto:ngoliveira@ff.ul.pt) until October 15<sup>th</sup> 2022