4th TRAINING COURSE, COST ACTION 17-112 PRO EURO DILI NET

Advance course | Novel challenges in Toxicology

October 19-21, 2021

The course will be held at FFUL in a hybrid-mode, with both in-person and virtual lectures (zoom platform). Nevertheless, the presential attendance is highly encouraged, if the circumstances allow.

Course Coordinators: Joana Miranda / Nuno Oliveira

Teaching Staff: The teaching staff is composed by lecturers with expertise in the field of each seminar. As such it includes professionals from academia and regulatory sciences, including internal teaching staff from FFUL, CA 17-112 members and invited external experts.

Participants: This course targets all PhD students, young investigators, and scientific community members.

Short introduction:

Novel challenges in Toxicology is an innovative advanced course that provides an updated overview of key toxicological concepts and milestones, and also simultaneously addresses the new challenges and opportunities of modern Toxicology. The course will be held at FFUL in the framework of the research areas of the Research Institute for Medicines – iMed. Due to the large interdisciplinary and translational nature of the Toxicology field it is expected that this course would be appealing to a high number of master students, PhD students, as well as young researchers.

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 *Omics* and potential of stem cell technology in predictive toxicology towards personalization.

Registration and Fees

Deadline for applications: 12th of September 2021

Fees:

- This course is free for trainees awarded by the CA17-112
- Trainees not awarded by the CA17-112 have a registration fee of 100€

Application:

Those trainees who want to apply for a COST reimbursement, and based on the COST rules for Training School, should send the following documents:

a) Cover letter, briefly (max. 2 pages) introducing the applicant, with information about the affiliation, academic and research background, interest in the TS and reasoning for attending the TS;
b) Applicant's CV (max 2 pages), including relevant publications;
c) Reference letter from at least one CA 17-112 member.

The submission will be made by e-mail to lunov@fzu.cz and gareth.sullivan@medisin.uio.no.

PROGRAMME

The course is divided into three major topics addressing a balanced combination of lectures on theoretical and practical case-based discussions presented during a dedicated course with limited attendance. The training programme has specific slots allocated to seminars and workshops, including informal discussions with lecturers (tutorial teaching). At the end of the course, the students are expected to orally present a group assignment consisting on a proposal for a Research Project.

TUESDAY – 19 October

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| ***Break***

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

11h30-12h30| Drug induced liver injury: where do we stand?

Isabel Lucena, Univ. Malaga, ES

12h30-13h30| Mechanisms of chemical-induced genotoxicity

Metka Filipic, NIB, SL

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, NMS, PT

WEDNESDAY – 20 October

Module 2: Emerging technologies in toxicology

1. *Advanced models in toxicology*

9-10h| 3D liver models in *in vitro* toxicology

Joana Miranda, FFUL, PT

10-11h| Zebra fish models in toxicology

Ozlen Konu, Bilkent University, TK

11-11h30| ***Break***

2. *Stem cell toxicology*

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

Gareth Sullivan, UiO, NO

12h30-13h30| Organs-on-a-Chip (OoC) in toxicology

Madalena Cipriano, Faculty of Medicine, University Tübingen, DE

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

3. *Systems toxicology: the "omics" era*

14h30-15h30| Systems toxicology

Juan M. Falcon-Perez, CIBERehd, ES

15h30-16h30| Proteomics for biomarkers identification in toxicology

Vukosava Milic Torres, FCUL, PT

4. *Personalized and predictive toxicology*

16h30-17h30| *Christopher Goldring, University of Liverpool, UK*

THURSDAY – 21 October

Module 3: Impact of Toxicology in the new era

1. *Safety issues in novel medicines*

9-10h| Regulatory toxicology

Beatriz Silva Lima, FFUL, PT

10-11h| Toxicological issues in advanced therapies

Isabel Vieira, Infarmed, PT

11-12h| Regulatory acceptance of 3R methods for non-clinical testing of human medicinal products: challenges and opportunities.

Sonja Beken, FAMHP, BE

12h-13h30| ***Lunch break***

2. *Milestones of toxicology and contemporary issues*

13h30-14h30| New insights on the bioavailability of xenobiotics

Fernando Remião, FFUP, PT

14h30-15h30h|Occupational exposure and human biomonitoring

João P Teixeira, INSA, PT

3. *Impact of toxicology in modern society*

15h30-16h30| *Félix Carvalho, SPF & EUROTOX & FFUP, Portugal*

16h30-17h| Guidelines for learning assessment & closing session

Nuno Oliveira and Joana Miranda

ASSESSMENT: *Written Document of the Research Project Assignments*

It consists in the preparation of a research project (8 pages limit) in a topic relevant within the framework of the course.

The research project should be structured to address an innovative research question as follows: *i*) Title; *ii*) The problem and the innovative approach; *iii*) Plan and methodology; *iv*) Expected results and impact.

The project will be evaluated according to the following criteria and weighting: a) Novelty and relevance (30%); b) Clarity and credibility of the approach to the theme/problem (30%); c) Multidisciplinary aspects of the research plan (40%).