UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

The principle of 3R in Biomedical studies

2425-122R-21

Aims

*The course is aimed at introducing the student to the 3R principles (Replacement, Reduction; Refinement) in the biomedical studies and to provide basic and applied knowledge on the experimental models and instruments to be applied in the experimental research.

The course is organized thanks to the collaboration of teachers from UNIMIB participating to the Center 3R for the promotion of the 3R principles in the didactics and research.

Contents

The 3R principles and incorporation into EU and Italian legislation regarding biomedical experimentation; biomedical statistic applied to the reduction of experimental animals; advanced in silico and in vitro methods for reduction and sostitution; in vivo models alternative to the use of mammals. During the course basic methods and models will be presented, as well as details on applied researches

Detailed program

- The 3R: principles, significance, and the legislation regarding animal experimentation.
- From stem cells to organoids: using in vitro stem cell based models to address the challenges of brain research
- In silico approaches for Structure-Based Drug Design

- Vertebrate experimental models alternative to mammals: the use of zebrafish and Xenopus laevis in developmental biology and toxicology.
- 3D bioprinted in vitro models
- Confidence interval and hypothesis testing in statistics: intepretation and examples
- In vitro modeling of complex diseases: 2D and 3D cell systems to dissect cancer biology and to improve translational research

-Optical microscopy imaging in vivo as a tool to reduce the use of lab animals

Prerequisites

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Teaching form

Lectures by Webconference

Textbook and teaching resource

Slides of the presentations and scientific articles will be provided by the teachers

Semester

Second semester

Assessment method

Oral examination

Office hours

To be fixed by mail

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING