

## **Programme for the Transversal Course for the PhD schools of Pavia University**

1 - **Transversal Course** (Macroareas 1, 2 and 3), organized by 3 doctoral schools (see point 3) and with the collaboration of the CHT - Center for Health Technologies (<http://cht.unipv.it/it/front-page/>)

2 - Title: Scientific Research and the 3Rs' principle

3 - Proponents: G.Cusella De Angelis (GC), A. Ferrigno, C. Lanni, M. Paolillo, M. Torre (MT), L. Visai (LV)

(GC: member of the PhD Faculty Board in Health Technologies, Bioengineering and Bioinformatics; MT: member of the PhD Faculty Board in Chemical and Pharmaceutical Sciences and Industrial Innovation; LV: Deputy Coordinator of the PhD Faculty Board in Translational Medicine)

4. - Educational objectives: The interdisciplinary course aims to provide knowledge on the topic of research within the 3Rs whose principles concern the ethical aspects in the use of animals in scientific experiments. The 3Rs are the initial letters of:

REDUCTION: reduction of the number of animals used for a specific study

REFINEMENT: improvement of experimental designs to reduce stress and suffering to animals

REPLACEMENT: replacement (even partial) of animal testing with alternative methods of comparable validity

These three words briefly describe the ethical principles that researchers should respect when undertaking animal experiments. The course therefore aims to present the main innovative applications of research within the 3Rs in order to promote responsible experimentation.

5 - Number of lesson hours: 16. The hours will be divided into 16 hours of theoretical frontal lessons (4CFU)

6 - Period of development: June 2022

7 - Professors: G. Cusella De Angelis, A. Ferrigno, C. Lanni, M. Paolillo, M. Torre, L. Visai, any other members of the respective doctorates and of the CHT together with scientists belonging to research groups of other Italian and foreign universities.

8 - Scientific / Organizing Committee: G. Cusella De Angelis, A. Ferrigno, C. Lanni, M. Paolillo, M. Torre, and L. Visai

9 - Potential PhDs students interested: the proponents, ie Technologies for health, bioengineering and bioinformatics; Chemical and pharmaceutical sciences and industrial innovation; Translational Medicine; but also Experimental Medicine; Biomedical science; Genetics, molecular and cellular biology; Psychology, Neuroscience and Data Science; Computational Mathematics and Decision Sciences; Physics; Private law, Roman law and European legal culture

10 - Course location: Classes will take place in June 2022 in one of the classrooms of the Biochemistry Unit of the Department of Molecular Medicine, Viale Taramelli 3 /b, Pavia.

NB: the method of conducting the lessons (in presence, remotely, mixed) will be decided near the beginning, based on the health situation, the number of members and the preferences expressed by the members themselves.

11 - Preliminary program:

- 2 hours of introductory lesson on "3Rs: Reduction, Refinement and Replacement and their applications" and presentation of the Interuniversity Center of the 3Rs (prof. G. Cusella De Angelis, Andrea Ferrigno, C. Lanni, M. Paolillo, M. Torre, L. Visai);

- 4 hours of lessons dedicated to the moral basis of animal experimentation entitled "Moral basis of animal experimentation" by Prof. Federico Zuolo, political and moral philosopher of the University of Genoa;
- 4 hours of lessons dedicated to the problems of the experiments to be conducted *in vivo* by reducing the number of animals entitled "*In vivo* testing protocols in order to reduce the number of animals" by Prof. Andrea Ferrigno;
- 2 hours of lessons dedicated to the description of new tissue engineering approaches for mesodermal tissue regeneration entitled "Current tissue engineering approaches for mesodermal tissue regeneration: an overview" by Dr Gabriele Ceccarelli;
- 2 hours of lessons on the presentation of 3D modeling and in silico tests entitled "3D modeling, In-silico trials, and digital twins for 3R" by Dr Michele Conti;
- 2 hours of lessons on 3D models for their application in cancer research and regenerative medicine entitled "From 2D monolayers to complex 3D cell cultures: applications in cancer research and regenerative medicine" by Dr. Nora Bloise.

12 - course language (lessons): English

13 - Learning mode: final exam with closed answers. Should the Covid or any other emergency recur, it will be possible to carry out the final test in presence, remotely, or mixed.