



Transversal course

Proponent

Prof.ssa Manuela Monti

Title

Socio genomics: how daily life affects (epigenetically) our DNA

Learning outcomes/abstract

An ever-increasing body of evidence documents a substantial link between the social context within which each of us lives and the functions of the genome of the somatic and germ cells composing our organism.

Environmental factors of various nature (chemical-physical, psychological) define the social context and can modify the gene expression of cells, altering the physiological state of tissues and organs. Xenobiotics and neuro-secreted molecules can act as biochemical mediators, converting what happens in our lives at the “biological” level.

The course will address the concept of epigenetics and how the genomes of all cells, and in particular germ cells, undergo non-structural modifications of the primary DNA sequence capable of altering the degree of transcription, activation, and expression of genes thanks to changes in secondary structures of DNA by adding or removing chemical groups to the proteins. These epigenetic modifications (imprinting of the genome) can be produced by exposure to the environment in which we spend our lives, from birth to senescence. They can be transmitted from one generation to another, creating advantages or disadvantages, thus determining inequalities in health, opportunities, income, and social rank, which, in a recursive mechanism, reinforce the social inequalities that may have originated them.

Goal

The main goal of this transversal course for Ph.D. students is to learn the basics of the most important epigenetic modifications (DNA methylation, histone acetylation, accessibility of chromatin to various enzymes, and the role of small non-coding RNAs, to name a few), how they can modify gene expression and how they can be transmitted intergenerational. At the end of the course, Ph.D. students will be able to understand better how our daily actions (diet, behavior, stress, physical activities, work, and consumption habits) affect our health and that of our children and grandchildren by modifying the gene expression of cells and altering the physiological state of tissues and organs.

Number of hours and planning

20

Credits

2.5 CFU

Period

March-June 2024

Lecturer

Manuela Monti



Scientific committee

Manuela Monti, Enrico Oddone, Cristina Montomoli

Delivery mode and location

Presence at Istituto di Istologia e Embriologia, Dipartimento sanità pubblica, medicina sperimentale e forense, University of Pavia

Language

English and or Italian

Evaluation criteria

Students will be evaluated on the following criteria:

Attendance

Participation in the discussion

Final presentation