UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Genetics II

2425-2-E1301Q072-E1301Q076M

Aims

To provide the essential bases to the understanding of Genetics, from the point of view of basic notions, concepts and methodology1. Knowledge and understanding

1. To know the basic concepts of Genetics
2. Applying knowledge and understanding to use the acquired knowledge in the courses of advanced Genetics
3. Making judgements
   to apply the basic principles of Genetics in order to solve Genetics problems
4. Learning skills
   to acquire the methodological and scientific skills required in the advanced courses
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Contents

PART 2 (Prof. Antonella Ronchi) methodological approaches for the studies of the different genome components. miRNAs: impact on phenotypes (examples). Transposons. Quantitative trait loci. DNA end RNA tumor viruses. Basic principles of cancer genetics. Genetic control of development in D. melanogaster. Genetics of the immune system.

Detailed program

PART 2
Basic techniques for the study of genetic material: cloning and sequencing of genomes. DNA and cDNA libraries.

Functional analysis (overexpression, downregulation and knock out) of genes. How to study regulatory sequences.
Functional analysis of microRNAs. Phenotypic consequences of miRNA deregulation (examples).
Transposable elements: genetic evidences at the basis of their discovery. Examples of different classes of transposons. Consequences of their transposition for the host organism. Their evolutionary role.
Quantitative trait loci: genetic basis and examples.
DNA and RNA tumor viruses
Cancer cell genetics. oncogenes, oncosuppressor genes, genes controlling genome stability.
Developmental genetics. Basic concepts. The model of D. melanogaster.
Molecular genetics of the immune system

Prerequisites

A basic understanding of cell biology and biochemistry; basic knowledge of zoology and botany is also useful.

Teaching form

PART II (Prof.Ronchi)
-18 lectures of 2 hours each in a delivery mode: focused on the presentation and illustration of content, concepts, and scientific principles.
-5 interactive 2-hour: featuring student contributions, case studies, and logical reconstruction of the steps that led to the scientific discoveries covered in the first (delivery mode) part.

All activities are conducted in person

Textbook and teaching resource

Edises: GENETICA
Other basic genetics textbooks - provided they are recent - may be used

Semester

PARTII: second semester

Assessment method

The exam has two parts:
PART I: prof Nicolis, written exam.
PART II prof. Ronchi, oral exam.
The oral exam consists of three questions. The first topic of discussion will be chosen by the Student.
Only Students who have successfully passed the written exam of the first module can access the oral, part II,

exam. No midterm exams are scheduled.

Office hours

By appointment,
please write to antonella.ronchi@unimib.it

Sustainable Development Goals