



[30h+15h exercices] 4 credits

This course is taught in the 2nd semester

Teacher(s): André Lejeune
Language: french
Level: 1st cycle course

Aims

Introductory course to genetics.

The objectives are

- to know and to understand the mechanisms that underly gene transmission from one generation to the next, the mechanisms that allow gene expression and the genetic variations that appear in individuals and populations;
- to be able to solve problems related to the topics mentioned above.

Main themes

The study of genetics is envisioned at three levels of organisation of life. At the level of the individuals, the general rules of gene transmission, their application in certain particular cases and exceptions are studied. Connexions with aspects of metabolism and notions of genomics are presented. On this basis and at the molecular level, the nature of the gene and its functioning are explained. Finally, the changes in genetic characteristics of populations are studied and connected briefly to certain aspects of evolution.

Content and teaching methods

Content

1. Genetics and the organism
2. Classical genetics. 2.1 Patterns of inheritance (laws of Mendel). 2.2 Chromosomal basis of heredity. 2.3 Extensions of Mendelian heredity (incomplete dominance, codominance, lethal alleles, multiple alleles, gene interactions). 2.4 Gene linkage and genetic mapping. 2.5 Chromosome mutations (structure, number).
3. Population genetics. 3.1 Hardy-Weinberg equilibrium. 3.2 Variations in populations.
4. Molecular genetics. 4.1 Genetic information (DNA, replication, transcription, translation). 4.2 Control of gene expression. 4.3 Gene mutations. 4.4 Structure and function of chromosomes. 4.5 Extranuclear genomes.

Methods

Theoretical classes and problem solving.

Other credits in programs

BIOL12	Deuxième candidature en sciences biologiques	(4 credits)	Mandatory
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