UCLouvain

lbirc2101a

2019

In view of the health context linked to the spread of the coronavirus, the methods of organisation and evaluation of the learning units could be adapted in different situations; these possible new methods have been - or will be - communicated by the teachers to the students.

4 credits	18.5 h + 22.5 h	Q1

Teacher(s)	Chaumont François ;Hachez Charles ;Morsomme Pierre (coordinator) ;
Language :	French
Place of the course	Louvain-la-Neuve
Main themes	The first part (Basics of genetic engineering) starts with a brief review of how genetic information is expressed (transcription, translation, post-translational modifications) in prokaryotic and eukaryotic organisms. The major steps of genetic engineering will then be examined: gene libraries, gene cloning, gene modification, genetic transformation of procaryotes. The second part (Analytical biochemistry) covers classic methods used to purify biological macromolecules et determine their identity and biochemical properties. Practicals illustrate standard techniques used in genetic engineering as well as in analytical biochemistry.
Aims	*The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Evaluation methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** An exam will be performed at the end of the practicals to assess the comprehension of the methodologies used (25% of the final score). An exam on the theoretical part will be organized to assess the understanding of the various concepts as well as the capacity to use these concepts to solve practical problems (75% of the final score).
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** The theoretical part will be taught by the teacher using the blackboard and Power Point files. Practicals will give the students (groups of two) the opportunity to put in practice the methodologies taught in the theoretical part.
Content	Part 1. Basics of genetic engineering (4 ECTS) Regulation of transcription and translation, posttranslational modifications, protein targeting in subcellular compartments. Tools of genetic engineering (restriction and modification enzymes). Cloning vectors (plasmids, phages, bacterial and yeast artificial chromosomes). Genomic and cDNA libraries. Library screening. PCR cloning. Gene characterization (restriction map, sequencing, expression profiling). Heterologous expression in bacteria. Part 2. Analytical biochemistry (4 ECTS) Centrifugation and fractionation of cells, organelles or molecules. Protein chromatography techniques. Protein electrophoresis (1D and 2D). Light and fluorescence microscopy of proteins. Mass spectrometry analysis and sequencing of proteins. Immunodetection (ELISA, western blotting, in situ). Genotyping (PCR and microsatellites).
Inline resources	Moodle
Bibliography	Syllabus et notes de cours
Other infos	Each part (Basics of genetic engineering and Analytical biochemistry) can be taken separately as optional course. Participation in the practical work is mandatory. Any unjustified absence will result in a penalty on the final grade of the course. Ths course can be given in english.
Faculty or entity in charge	AGRO

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Biomedical Engineering	GBIO2M	4		
Master [120] in Biochemistry and Molecular and Cell Biology	BBMC2M	3		
Master [120] in Agricultural Bioengineering	BIRA2M	4		
Master [120] in Chemical and Materials Engineering	KIMA2M	4		
Master [60] in Biology	BIOL2M1	3		