LBIRC2101B

2013-2014

Analyse biochimique et notions de génie génétique: Notions de génie génétique

4.0 credits	18.5 h + 22.5 h	1q

Teacher(s) :	Boutry Marc ; Morsomme Pierre ; Chaumont François ;
Language :	Français
Place of the course	Louvain-la-Neuve
Inline resources:	Icampus
Prerequisites :	General biochemistry and general genetics
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 :	a. Contribution de l'activité au référentiel AA (AA du programme) 1.1, 1.3 2.1, 2.2 3.6, 3.7, 3.8 6.4, 6.5 b. Formulation spécifique pour cette activité des AA du programme By the end of this course, the student is expected: - To explain the main techniques of genetic engineering - To be able to use basic methodologies of genetic engineering - To explain the main techniques of analytical biochemistry - To be able to use the basic methodologies of analytical biochemistry - To analyze experimental data with a critical mind - To be able to compare various methodologies and propose the most adequate to address a practical problem of genetic engineering or analytical biochemistry *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 :	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 :	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).
Other infos :	Each part (Basics of genetic engineering and Analytical biochemistry) can be taken separately as optional course.
Cycle and year of study :	> Master [120] in Agricultural Bioengineering > Master [120] in Chemical and Materials Engineering

Faculty or entity in charge:	AGRO