UCLouvain

lbio1322

2025

Integrated tutorials in biochemistry and molecular biology

4.00 credits	5.0 h + 45.0 h	Q2

Teacher(s)	Hallet Bernard ;Soumillion Patrice ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	To follow this course, it is necessary to master the knowledge and skills developed in the course LBIO1223 (Molecular biology) *The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.*
Main themes	From the phenotype to the gene and from the gene to the protein, the formation covers different approaches used to identify and isolate a gene, to modify its sequence, to study its function, and to characterise its product. It illustrates the concepts of DNA cloning, the structure-function relationship of proteins and of retro-genetics, by making use of DNA recombinant techniques (restriction, ligation, PCR, sequencing, transformation, etc), mutagenesis, purification and enzymatic characterisation of proteins.
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 The tutorials constitute a practical and theoretical initiation to the general procedures in modern genetics, combining molecular biology and biochemical techniques. Starting from real problems, they aim to familiarize the student with the design of experimental approaches and the interpretation of the results.
Evaluation methods	Experimental part of the exercises: Poster presentation summarizing the results obtained in laboratory. Seminars part: A written exercise in which student have to solve a basic problem of genetic engineering. Students may have access to all information they would need (articles, notes, powerpoints, etc.) to solve the problem.
Content	The major part of the activity consists in a laboratory work (45h) close to real research situation, from mutagenesis of a gene of interest to the phonotypical and biochemical characterization of the mutated gene product. Manipulation steps include the mutagenesis of a cloned DNA fragment, the identification of the mutants of interest, the sub-cloning of mutated genes, the sequencing of mutations, purification of the mutated proteins and measurement of their enzymatic activity. Results are interpreted in terms of structure-function relationship changes in the enzyme based on protein structure modelling software. In the accompanying seminars (15h), theoretical aspects of the practical work are discussed, and an overview is given on the basic methods of molecular biology (PCR, gene cloning, DNA sequencing, mutagenesis, protein expression and purification etc.)
Other infos	Precursory courses: Basic formation in molecular genetics, microbiology, cellular biology and biochemistry, (level BIO12-BIO13) Support · Experimental part of the exercises: -Textbook and protocols explaining the manipulation performed in laboratory. · Seminars -Powerpoint files available on moodle Teaching team: Teaching assistants in molecular biology and biochemistry with punctual intervention of main teachers
Faculty or entity in charge	BIOL

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Biochemistry and Molecular and Cell Biology	BBMC2M	4		🔍
Additionnal module in Biology	APPBIOL	4		🔍
Minor in Biology	MINBIOL	4	LBIO1223	🔍