UCLouvain

lbrmc2101

2019

Genetic engineering

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.

3 credits	30.0 h + 7.5 h	Q1

Teacher(s)	Chaumont François (coordinator) ;Hachez Charles ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	General biochemistry and general genetics *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	The theoretical part will detail the major steps of genetic engineering: preparation and screening of libraries, gene cloning, gene characterization and modification, gene expression in heterologous hosts. Concrete problems of genetic engineering in the microbial, animal and plant fields will be discussed. Recent examples of genetic engineering achievements from the recent literature will be discussed.
Aims	a. Contribution de l'activité au référentiel AA (AA du programme) Cohérence des AA cours en regard de ceux du programme 1.2, 1.3 2.2 3.4, 3.9 6.1, 6.2 b. Formulation spécifique pour cette activité des AA du programme 1 By the end of this course, the student should be able: - To explain the main genetic engineering methodologies - To choose, according to the problem posed, among different strategies used to clone a gene, modify it and transfer it into other organisms - To propose experimental approaches aimed at solving practical problems of genetic engineering in the microbial, animal and plant fields - To understand and set out examples of genetic engineering in the microbial, animal and plant fields as described in English scientific journals - - - - *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.** The assesment is based on, on the one hand, the preparation and presentation of the theme in front of the class (flipped classroom; 40%) and, on the other hand, an open-book written examination on the solving of problems of genetic engineering (60%) The flipped classroom part is subject to continuous evaluation of student work, accounting for 40% of the final course evaluation. Therefore, no further evaluations are organized during the exam sessions for this part. The mark obtained for this part is deemed to be attached to each of the sessions of the academic year. Students are also required to self-assess on flipped classroom work and this self-assessment can be used to adapt the grades.
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** The course is organized as a flipped classroom. Students are divided into working groups during the first course and a theme is assigned to each group. They will develop the theoretical aspects of a model organism used in genetic engineering and will answer a thematic question asked by the teachers. In addition, classroom exercises are organised. Concrete problems of genetic engineering are submitted to the students who will propose solutions that will be discussed all together.
Content	Theoretical part: Methods of genomic and cDNA screening - Global analysis of the genome and its expression (genomics, transcriptomics, proteomics, metabolomics) - directed mutagenesis - gene expression in heterologous hosts: Escherichia coli, other bacteria, yeast, transgenic cell lines and transgenic organisms (animals and plants) - protein engineering - genic therapy.

	Solving problems: concrete problems of genetic engineering will be exposed and solved by the students.
Inline resources	Moodle
Bibliography	Syllabus et ouvrages de référence mentionnés au premier cours
Other infos	This course can be given in English. Participation in the first course is mandatory for the organization of the flipped classroom.
Faculty or entity in charge	AGRO

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Biomedical Engineering	GBIO2M	3		
Master [120] in Chemistry and Bioindustries	BIRC2M	3	LBIRC2101	
Master [120] in Biochemistry and Molecular and Cell Biology	BBMC2M	3		
Master [60] in Biology	BIOL2M1	3		