

Faculty of Biological, Agronomic and Environmental Engineering

BRMC2101 Genetic engineering

[22.5h+15h exercises] 3 credits

This course is taught in the 2nd semester

Teacher(s): Marc Boutry
Language: French
Level: Second cycle

Aims

To acquire broad knowledge of the methodology of genetic engineering, including the various strategies to clone genes, modify and move them into various organisms. The course should provide the student with the ability to outline an experimental approach to solve common genetic engineering problems.

Main themes

The theoretical part consists in a detailed analysis of the major steps of genetic engineering: construction and screening of libraries, characterization and modification of genes, gene expression in heterologous hosts. Typical problems of genetic engineering will be solved. Examples of genetic engineering achievements will be illustrated from the recent literature.

Content and teaching methods

1. Theoretical part :

Methods for screening genomic and cDNA libraries

Global analysis of the genome: genomics, transcriptomics, proteomics

Directed mutagenesis

Gene expression in heterologous hosts: bacteria, yeast, animal cell lines, plant cell lines, transgenic animals and plants

Protein engineering

Gene therapy

2. Exercices: the students will be trained in solving typical problems of genetic engineering by combining the different approaches seen in the theoretical part.

3. Seminars given by the students will illustrate recent examples of genetic engineering achievement in the microbial, animal and plant field.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Prerequisite: BIRC 2103 Molecular biology and concepts of genetic engineering or an equivalent course.

Programmes in which this activity is taught

BIR2 Bio-ingénieur
SC3DA Diplôme d'études approfondies en sciences

Other credits in programs

BIOL22/A	Deuxième licence en sciences biologiques (Biologie moléculaire, cellulaire et humaine)	(3 credits)	
BIOL22/B	Deuxième licence en sciences biologiques (Biologie des organismes et des populations)	(3 credits)	
BIR22/2C	Deuxième année du programme conduisant au grade de bio-ingénieur : Chimie et bio-industries (Ingénierie biomoléculaire et cellulaire)	(3 credits)	Mandatory
CHIM22	Deuxième licence en sciences chimiques		
SC3DA/B	Diplôme d'études approfondies en sciences (Biologie)	(3 credits)	