

UE Macromolecular engineering



ECTS
6 credits



Component
UFR Chimie-
Biologie

- > **Teaching language(s):** English
- > **Open to exchange students:** Yes
- > **Code d'export Apogée:** YACH8U25

Presentation

Description

The course will present the experimental strategies used to produce macromolecular samples for biophysical, structural studies and biotechnical applications, from bioinformatics analysis to recombinant protein expression systems, automation (robotics), purification and engineering and measurement of sample quality. Expected competences acquired by the students: expertise in bioinformatic analysis of macromolecule sequence and structure, understanding methods and strategies used to express and purify macromolecules, expertise in experimental methods used for sample quality control, practical experience on platforms on the EPN Campus.

Course parts

UE Macromolecular engineering - TD	Tutorials (TD)	15h
UE Macromolecular engineering- CM	Lectures (CM)	22,5h
UE Macromolecular engineering - TP	Practical work (TP)	9h

Period : Semester 8

Bibliography

Details:

q Part I - Structural bioinformatics

- § Structural database search
- § Sequence analysis
- § Structural analysis of biological macromolecules
- § Introduction to molecular modeling
- q Part II - Expression, purification and engineering of macromolecule
- § Cloning standard and high throughput
- § Expression (bacteria, yeast, baculovirus, mammalian cells, cell free,...)
- § Labeling – chemistry of proteins and nucleic acids (in vivo, in vitro chemical labeling, isotope, fluorescence, ...)
- § Purification (chromato, prep cell, large scale fermentation...)
- § Engineering and design – to improve stability, solubility, ... to produce new enzymes.
- § Visits of the platforms: expression (IBS-EMBL), purification...
- q Part III - Sample quality control
- § SDS PAGE, DLS, CD, thermofluor, SecMALS, Mass spectrometry, sequencing, ...
- § Visits and practical courses on the different platforms of the PSB

Useful info

Contacts

Program director

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Place

› Grenoble

Campus

› Grenoble - University campus