

UE Macromolecular Engineering

 ECTS
6 crédits

 Composante
UFR de Chimie
et de biologie

 Période de
l'année
Printemps (janv.
à avril/mai)

Diplômes intégrant cet élément

- Master Biologie - Santé

- > Langue(s) d'enseignement: Anglais
- > Ouvert aux étudiants en échange: Oui

Présentation

Description

The course will present the experimental strategies used to produce macromolecular samples for biophysical and structural studies, 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 bioinformatics 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.

Heures d'enseignement

CM	CM	21h
TD	TD	16,5h
TP	TP	9h

Période : Semestre 8

Informations complémentaires

Course outline

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

Infos pratiques

Contacts

Responsable pédagogique

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Lieu(x) ville

➤ Grenoble

Campus

➤ Grenoble - Domaine universitaire