

UE Cell Biochemistry



Composante
UFR de Chimie
et de biologie



Période de
l'année
Automne (sept.
à dec./janv.)

Diplômes intégrant cet élément

- Master Biologie - Santé

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

Présentation

Description

Course outline

Biocatalysis

Basis in Enzymes cofactors and vitamins

Cofactors involved in group transfer

Cofactors involved in redox reaction,

Cofactors and chemical origin of life

Biological Chemistry of Oxygen

Chemistry of O₂

Defense mechanism, detoxification of reactive oxygen species (ROS)

Role of ROS in physio-pathology

Regulation, sensing mechanism

Cellular sources of ROS.

Membrane Biochemistry

Lipids, Membrane and Rafts

Membrane proteins: synthesis and topology
Membrane proteins and detergent biochemistry
Receptors
Transporters
Vesicular trafficking.

Biochemistry of viral infection and immunity

Membrane fusion
Membrane budding
Biochemistry of innate factors

Extracellular Biochemistry: GAGs

Extracellulaire matrices
Glycosaminoglycans (GAG): biosynthesis and catabolism
GAG: biological activities
GAG: pathology and applications

Methods of study

Molecular factory characterisation : cryoelectron microscopy
Imaging complexes, location and dynamic in cellulo
This module brings strong background (relative to oxidative stress) to the Unit "Experimental Approaches in Biology"

Heures d'enseignement

CM	CM	31,5h
TD	TD	21h

Période : Semestre 7

Compétences visées

-Targeted skills:

The course is organized in several interconnected topics:

- 1/ Biocatalysis
- 2/ Oxygen Chemistry in Biology
- 3/ Membrane Biochemistry (membranes lipids and rafts, membrane proteins, vesicular trafficking)
- 4) Membrane – Virus interaction: biochemistry of infection, membrane fusion, membrane budding
- 5) New methods to study macromolecular complexes and high resolution cell biology imaging.
- 6) Biochemistry of extracellular matrix.

Expected competences acquired by the students:

- expertise in structural analysis of an active site
- basics in chemical mechanism occurring in enzymes (as a function of the different types of cofactors)
- characterization of cofactors/active site by biophysical methods.
- Electron transfer in biology

All these competences are preliminary to future drug design expertise and approaches that will be viewed more deeply in other modules of the master.

- Chemistry and reactivity of O₂ in biology (molecular basis of oxydative stress, role in pathology (cancer, etc..); detoxification,
- Biochemistry of lipids, lipids rafts, membrane protein biochemistry (receptors, transporters, channels), basis in pharmacology of membrane proteins.
- Biosynthesis and biology of glycosaminoglycans.
- Cell biology of mb : mb budding, fusion, vesicular trafficking

Infos pratiques

Contacts

Responsable pédagogique

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Lieu(x) ville

➤ Grenoble

Campus

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