

Biophysics

Introducing

Description

Programme (detailed contents):

- Introduction to Biophysics
- Protein structure
- Ion channels and electrophysiology
- Random walk in biology
- Organisation and dynamics of membranes
- Fluorescence microscopy and spectroscopy
- Stochasticity in gene expression
- Cell signalling

Objectives

At the end of this module, the student will have understood and be able to explain:

Advanced methods in molecular and cellular biophysics:

- Fluorescence microscopy and correlation spectroscopy
- Flow cytometry, imaging flow cytometry, fluorescence/image-activated cell sorting
- Electrophysiology, nanopore sensing and sequencing
- PyMol to visualize protein structures
- Surface-sensitive techniques

Main concepts in molecular and cellular biophysics:

- Macromolecular crowding
- Noise as a general principle underlying biological organisation and functions (stochasticity in gene expression, random walk, protein conformational changes)
- Cell signalling in space and time

The student will be able to:

- Interpret data from biophysical experiments and link the results to the studied concepts
- Apply biophysical insights to solve new problems in biology and bioengineering.

Necessary prerequisites

Has already followed a general biology course at university level

Évaluation

L'évaluation des acquis d'apprentissage est réalisée en continu tout le long du semestre. En fonction des enseignements, elle peut prendre différentes formes : examen écrit, oral, compte-rendu, rapport écrit, évaluation par les pairs...

Practical info

Location(s)

 Toulouse