

Microbial and Mammalian cells culture



ECTS
7 credits



Component
INSTITUT
NATIONAL
DES SCIENCES
APPLIQUEES
TOULOUSE



Number of
hours
98h

In brief

> **Teaching language(s):** Français, Anglais

Presentation

Description

Basic concept of cellular biology, establishment of a cell line, normal and transformed cells, culture media and culture systems, contaminations, transfection, different uses of mammalian cells

Kinetic models of growth and metabolites production, effects of the variables and environmental parameters, interaction between the biological dynamics and the mass transfers, equations of the bio-reactors: batch, chémostat, plug flow reactors, fed-batch, reactor with cellular recycling, application to the metabolites productions, numerical processing of the experimental data.

Organisation:

At the beginning of the course the students will receive a document containing the major informations given in the

course and a document with the informations "step by step" to manipulate themselves two cell lines.

The "uses of mammalian cells" will be treated by the students themselves, groups of 3 students will work on different examples and will present the results of their work.

Main difficulties for students:

-practice of mammalian cell cultures

-mathematical approach of the various concepts of biochemical engineering

Objectives

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

- How to establish a cell line in culture
- Mammalian cell culture specificities in terms of conditions and media
- Major uses of mammalian cells
 - Various kinetic behaviours of microbial growth and production
- Several strategies from implementation of the microbial cultures in the bio-reactor

The student will be able to:

- use a vocabulary specific to cell culture
- name major characteristics of a mammalian cell
- manipulate a cell line
- analyse, comment and criticize a scientific paper in the domain
- to calculate the various kinetic and stoichiometric parameters of microbial cultures

to calculate the potentialities of productions for the various bio-reactors

Pre-requisites

Basic knowledge of cellular biology

Basic concepts of molecular biology

Courses on kinetics, microbiology, metabolism, reactor engineering

Useful info

Contacts

Education manager

STEPHANE GUILLOUET

✉ guilloue@insa-toulouse.fr

Place

➤ Toulouse