ChE-433

Biotechnology lab (for CGC)

Pick Horst

Cursus	Sem.	Type
Biotechnology minor	E	Opt.
Ing.-chim.	MA2, MA4	Opt.

Language of teaching	English
Credits	4
Withdrawal	Unauthorized
Session	Summer
Semester	Spring
Exam	During the semester
Workload	120h
Weeks	14
Hours	**6 weekly**
Practical work	6 weekly
Number of positions	

Il n'est pas autorisé de se retirer de cette matière après le délai d'inscription.

Summary

This laboratory-training course is designed to give students a comprehensive insight into laboratory research techniques in the field of biotechnology and pharmaceutical biotechnology with practices employed in the industry. Accompanying lectures provide the theoretical background.

Content

- Engineering of a synthetic gene encoding human pro-insulin using recombinant DNA techniques
- Basic animal/human cell culture training (Aseptic techniques, quantification of cell growth, cell passaging, adherent and suspension cells cultures, determination of cell viability).
- Engineering of a stable mammalian cell line using a transposon-based approach (Production of a recombinant protein for the treatment of rheumatoid arthritis).
- Bioreactor training for pharmaceutical protein production (Fed-batch culture, daily sampling for analysis: cell density, viability, glucose, lactate, glutamine).
- Pharmaceutical protein purification, SDS-page, ELISA, Mass spectrometry analysis.
- Production and purification of an anti-Rhesus D monoclonal antibody.
- Production and purification of a recombinant anti-tuberculosis vaccine.

Keywords

Cell culture technologies, therapeutic proteins, monoclonal antibodies, recombinant vaccines, bioreactor, affinity purification, ELISA, mass spectrometry, flow cytometry, recombinant DNA techniques.

Learning Prerequisites

Required courses

no

Recommended courses

Pharmaceutical Biotechnology (ChE-436)

Learning Outcomes

By the end of the course, the student must be able to:

- Demonstrate comprehensive understanding of the principles and practices of biotechnology
- Demonstrate technical skills in methods of biotechnology
- Manage working in a team to organise laboratory activities
- Choose an appropriate method for obtaining experimental data
- Demonstrate the safe use and disposal of chemicals and biological samples
- Demonstrate he development of analytical skills for the management and communication of experimental data
- Demonstrate understanding of typical conventions of lab or experimental reports
- Elaborate good scientific writing, appropriate use of scientific literature and scientific data presentation (Figures/tables)

Transversal skills

- Plan and carry out activities in a way which makes optimal use of available time and other resources.
- Set objectives and design an action plan to reach those objectives.

Teaching methods

Lectures, laboratory training

Expected student activities

Hands-on lab experiments, lab reports

Assessment methods

During the semester

- Three written tests (20 %)
- Lab participation (10 %)
- Three written lab reports (70 %)

Supervision

Office hours	Yes
Assistants	Yes
Forum	Yes