Course Specifications
Valid as from the academic year 2017-2018

Biotechnology and Protein Medicines (J000422)

Course

Lecturers in academic year 2018-2019
Deforce, Dieter
FW01 lecturer-in-charge
Van Nieuwerburgh, Filip
FW01 co-lecturer

Course offerings and teaching methods in academic year 2018-2019
A (semester 1)
Dutch
lecture 40.0 h
practicum 30.0 h

Offered in the following programmes in 2018-2019
Master of Science in Pharmaceutical Care 6 A
Master of Science in Drug Development 6 A

Teaching languages
Dutch

Keywords
Biotechnology, DNA, RNA, chromosome, protein synthesis, PCR, recombinant DNA and proteins, monoclonal antibodies, pharmaco-genomics-proteomics, vaccines.

Position of the course
The goal of this course is to give students insight into the possibilities of DNA recombinant technology in the biomedical sciences – both in the diagnostic as in the therapeutic field. Final goal is being able to apply the biotechnological science in a pharmaceutical context (production, purification, formulation, administration). Gaining insight into the specific guidelines of biological medicines.

Contents
- The application of DNA recombinant technology in the biomedical sciences.
- Basic concepts such as DNA and RNA structure and synthesis, genetic code, the chromosome, protein chemistry and synthesis.
- The PCR reaction and various applications.
- The backgrounds of the DNA recombinant technology, including cloning, cDNA, blotting, gel electrophoresis, DNA sequencing.
- Tissue and cell cultures.
- The preparation and various applications of monoclonal antibodies.
- Monoclonals as potential anticancer medicines.
- The preparation of various medicines such as insulin, human growth hormone, hepatitis B virus vaccine, tissue plasminogen activator,... by means of DNA recombinant technology.
- Protein stability and degradation mechanisms.
- Some regulatory considerations.
- Pharmaco-genomics and proteomics.
- Vaccine technology from the biotechnological point of view.
- Purification and pharmaceutical formulation aspects of biotechnological medicines.

Initial competences
Having successfully finished the courses: animal cell and tissue biology, biochemistry and biophysics I and II. Or having accomplished the intended competences in one or the other way.

Final competences
1 - Apply biotechnology in a pharmaceutical context.
2 - Reconstruct the whole process of the discovery of the biotechnological medicine to a pharmaceutical recombinant protein.
3 - Understand and know the protein synthesis.
4 - Know the various techniques such as PCR, cloning, blotting, electrophoreoses.
5 - Know how monoclonals are made and what their advantages, disadvantages and applications are.
6 - Understand pharmacogenomics and proteomics.

Conditions for credit contract
Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract
This course unit cannot be taken via an exam contract

Teaching methods
Lecture, practicum

Learning materials and price
The students can buy a syllabus (price 15 euros). The slides being used during the hearing colleges will be provided on Minerva.

References

Course content-related study coaching
Questions can be asked during and after the hearing colleges. The scientific employees of the lab are also available both during and after the practicum courses.

Evaluation methods
end-of-term evaluation and continuous assessment

Examination methods in case of periodic evaluation during the first examination period
Written examination

Examination methods in case of periodic evaluation during the second examination period
Oral examination

Examination methods in case of permanent evaluation
Oral examination, participation, assignment, job performance assessment, report

Possibilities of retake in case of permanent evaluation
examination during the second examination period is not possible

Calculation of the examination mark
Theorie: periodegebonden, Practicum: niet-periodegebonden.
Het practicum wordt voor 5 van de 20 punten in rekening gebracht (Opzoekwerk, verslag, ondervraging, dagelijks werk). Voor het practicum is er geen tweede examenkans. Bij niet deelname aan het practicum kan als totaalcijfer maximaal 6 op 20 behaald worden ongeacht de punten op theorie.
De eindscore is geen mathematisch totaal van de punten op individuele vragen.