Course Specifications
Valid as from the academic year 2017-2018

Cellular Biological and Molecular Techniques for Biomedical Research (G000796)

Course size (nominal values; actual values may depend on programme)
- Credits: 4.0
- Study time: 120 h
- Contact hrs: 45.0 h

Course offerings in academic year 2017-2018
- A (year)
- Dutch

Lecturers in academic year 2017-2018
- Favoreel, Herman
  - DI04 lecturer-in-charge

Offered in the following programmes in 2017-2018
- Master of Veterinary Medicine in Veterinary Medicine (main subject Research)
  - 4 credits
  - A offering

Teaching languages
- Dutch

Keywords
- Cell biology, molecular biology, research tools, biomedical research

Position of the course
To gain an overview on and an insight in the different basic tools that are being used in cell biological and molecular aspects of biomedical research. This knowledge will enable students to smoothly enter a biomedical research environment.

Contents
The course starts with an introduction on the state of the art of the biomedical research, and a short overview of basic concepts of cell biology and molecular biology. Afterwards, different cell biological and molecular tools that are important in current biomedical research will be discussed. These tools comprise e.g. in vitro cultivation of cells (primary cells, cell lines, stem cells, cloning), microscopical techniques and micromanipulation, cell sorting methods, DNA-RNA-protein analysis tools (e.g. PCR, sequencing, transfections, recombinant protein technology, agarose and SDS polyacrylamid gel electrophoresis, Western-Southern-Northern blotting, in situ hybridisation, RNA interference, micro-arrays, transgenic animals). The course will also include practical exercises, which will allow the students to get acquainted with different of these tools.

Initial competences
Taking up this course is only possible when one has passed the Bachelor degree in Veterinary Sciences or when one is following a GIT trajectory between 3rd Bachelor and 1st Master.
For external students (students nog enrolled at the Faculty of Veterinary Medicine):
taking up this course is only possible when the most important end competences of the Bachelor of Veterinary Sciences degree are fulfilled and upon approval by the curriculum commission.
A basic knowledge in cell biology/cytology, genetics, and biochemistry is required.

Final competences
(Approved)
1. have an thorough knowledge of commonly used cell biological techniques and have insight in how these can be applied in scientific research towards the causes of, pathogenesis of and cures for infectious and non-infectious diseases.
2. have an thorough knowledge of commonly used molecular techniques and have insight in how these can be applied in scientific research towards the causes of, pathogenesis of and cures for infectious and non-infectious diseases.
3. being able to apply basic cell biological and molecular techniques
4. being able to critically analyse (own) research results with regard to cell biological and molecular techniques
5. have insight in which cell biological and molecular techniques and methods are suitable to be used in own research
6. to be convinced of the necessity of lifelong learning with regard to scientific research methods
7. display an ability to reason logically in a research setting
8. being able to approach scientific questions via different angles (multiperspectivism)
9. being able to communicate in a fluent, comprehensible and scientific way on the (application of) the acquired techniques
10. to be convinced of the added value of international scientific contacts

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
Learning material comprises a syllabus, course notes, notes of the practical exercises, powerpoint presentations used during the courses (available via Minerva). Cost: 15 EUR

References

Course content-related study coaching
During the theoretical courses, students will be guided in recognizing key aspects of the course. In addition, during the practical exercises, students will be guided intensely and feedback will be provided.

Evaluation methods
end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period
Written examination with open questions, oral examination

Examination methods in case of periodic evaluation during the second examination period
Written examination with open questions, oral examination

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation
not applicable

Extra information on the examination methods
Written exam with open questions, based on teaching material provided via the syllabus and during the courses (1/2 of the points).
Oral exam consisting of an open research question (with written preparation): hypothetical research problem for which the student needs to indicate what she/he would investigate (and why) and which cell biological and molecular techniques she/he would use (and why/how) (1/2 of the points).

Calculation of the examination mark
Not participating at the practical courses without acceptable reason may lead to a total score 10/20.
Score on 20 is calculated by adding the scores for the written open questions (10 points) and the oral research question (10 points).