Course Specifications
Valid in the academic year 2020-2021

Due to Covid-19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size
(nominal values; actual values may depend on programme)

Credits 5.0  Study time 150 h  Contact hrs 25.0 h

Course offerings and teaching methods in academic year 2020-2021

A (semester 2)  English  Gent  lecture 2.5 h
microteaching 15.0 h

Lecturers in academic year 2020-2021

Cools, Piet  GE32  lecturer-in-charge
Vaneechoutte, Mario  GE06  co-lecturer

Offered in the following programmes in 2020-2021

Master of Science in Biomedical Sciences
5  A

Teaching languages

English

Keywords

Bacteriology, parasitology, protozoa, host pathogen interaction, microbiomes, bacterial stress response and virulence mechanisms, chronic infections, biofilm, probiotics, bacteriophages

Position of the course

Starting from the knowledge gained during the course Microbiology lectured during the 3rd Bachelor Biomedical Sciences, the mechanisms used by bacteria to evade stress from the environment - in particular the innate immunity response of the host - and to cause infection, are studied in detail. The course focuses on chronic infections because their importance is increasing, because they are difficult to treat with antibiotics and because they are in the center of research interests of the lecturer, i.e. bacterial biofilms, bacterial vaginosis and Pseudomonas aeruginosa infection of airways of cystic fibrosis patients. In addition the possibilities and limitations of classic antibiotics based therapy and alternative prevention and treatment methods based on e.g. bacteriophages and probiotics are discussed.
Emphasis on molecular pathogenesis: the interaction (virulence, immune defense escape) of bacteria with their hosts, studied at the molecular level.

Contents

* Bacterial taxonomy and identification: Methods to classify and identify bacteria
* Complex microbiomes of the human body: Overview of the human microbiome and methods to characterize complex microflora
* Bacterial stress responses and virulence mechanisms: Colonisation and infection mechanisms at the molecular level
* Parasites and protozoa: molecular mechanisms of infection
* Chronic infection I: Cystic fibrosis and infection with Pseudomonas aeruginosa: Chronic infection and biofilm formation
* Chronic infection II: Vaginal microbiome and adverse pregnancy outcome: Composition of normal and disturbed vaginal microbiome and its consequences for pregnancy outcome
* Alternative therapy I: Bacteriophages: Taxonomy, characteristics, possibilities and limitations for therapy
* Alternative therapy II: Probiotics and prebiotics: Definitions, overview, applications, limitations

Initial competences

Having successfully completed the courses Immunology, Microbiology, Molecular
Biology I, Molecular Biology II and Human pathogenesis from the bachelor program biomedical sciences, or having acquired the relevant ending objectives by other means.

Final competences
1. To possess advanced general as well as detailed knowledge of microbiology and infection mechanisms.
2. To understand the possibilities and limitations of classical (antibiotic based) as well as alternative (e.g. bacteriophage, probiotic based) treatments of infection.
3. To be able to analyse in a critical manner scientific publications.
4. To be able to estimate the scientific value of statements and of publications of all sorts.
5. To be able to write a scientific report regarding microbiological subjects.
6. To be able to present information orally and in a structured manner.

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, microteaching

Extra information on the teaching methods
Ex cathedra college: The lecturer teaches introductory lessons: one about the technicities of preparing a presentation and one or more about actual subjects of interest in microbiology. The students can pick one of these themes for their presentation/lesson and their review.
Microteaching:
Each student teaches one lesson of approximately 45 minutes regarding a subject selected from a series of possible subjects, provided by the lecturer. Each student prepares this lesson and contacts the lecturer to further finetune the lesson together, during about one hour.

Learning materials and price
Hand-outs of ex cathedra colleges (Free, English). Selected scientific publications and web sources for group work (Free, English), Ufora (English).

References

Course content-related study coaching
By e-mail or personal after appointment by e-mail

Evaluation methods
End-of-term evaluation and continuous assessment

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

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

Examination methods in case of permanent evaluation
Oral examination, participation, assignment

Possibilities of retake in case of permanent evaluation
examination during the second examination period is possible in modified form

Extra information on the examination methods
Evaluation Methods Evaluation throughout semester as well as during examination period
During examination period:
Oral open-book exam (30 min), written preparation (45 min)
During semester:
assessment of quality of the preparation of the lesson to be given by the student; assessment of the quality of the oral presentation assessment of participation during the lessons.

Second chance: Possible in adapted form
Frequency: Oral presentation and written review: once.

(Approved)
Participation in group work: continuous.

Calculation of the examination mark
Periodic evaluation: 50%
Permanent evaluation: 50%