

## Human and Animal Biotechnology (I002613)

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

**Credits 5.0** **Study time 150 h**

**Course offerings in academic year 2023-2024**

A (semester 2) English Gent

**Lecturers in academic year 2023-2024**

Vanrompay, Daisy LA22 lecturer-in-charge

**Offered in the following programmes in 2023-2024**

	crdts	offering
<a href="#">Master of Science in Bioscience Engineering: Cell and Gene Biotechnology</a>	5	A
<a href="#">Exchange Programme in Bioscience Engineering: Cell and Gene Biotechnology (master's level)</a>	5	A

**Teaching languages**

English

**Keywords**

1 Cell and tissue engineering, 3D culturing, gene expression, biotechnological drugs, gene therapy, vaccinology, nanobodies

**Position of the course**

This course aims to give students an overview of the main aspects of human and animal biotechnology and its related techniques and applications

**Contents**

1) general aspects of cell and tissue engineering, 2) 3D culturing, organoids, 3) embryology and stem cells, 4) gene transfer and expression in eukaryotic cells, 5) production of classic and recombinant vaccines, including DNA and mRNA vaccines, 6) nanobody engineering, 7) gene therapy, 8) recombinant drugs and their registration

**Initial competences**

Human and Animal Biotechnology builds on certain learning outcomes of course units Microbiology, Cell Biology, Gene Technology and Molecular Diagnostics; or the learning outcomes have been achieved differently.

**Final competences**

- 1 The student possesses broad knowledge, at an advanced level in a number of basic disciplines in relation to biomedical applications
- 2 The student gains the necessary skills for the manipulation of human and animal cells and their tissues
- 3 The student gains the necessary skills for gene expression in eukaryotic cells
- 4 The student can design and implement strategies for the development of recombinant drugs and their applications
- 5 The student is able to assess new scientific developments in genetic engineering and their applications in a scientific and socio-economic context
- 6 The student is aware of ethical and confidentiality aspects of some human and animal biotechnology applications

**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, Practical, Independent work

### **Extra information on the teaching methods**

Theory: lecture using power point presentations which will be made available via the electronic learning platform and also movies on the topic. Practical: biotechnological engineering techniques focused on the contents of the course and to be performed by the student in the laboratory. Master's dissertation: possibility to prepare a Master's dissertation.

### **Learning materials and price**

Course book. Estimated price 20 euro

### **References**

- 1) Animal Cell culture: essential methods; Wiley-Blackwell, (2011). J.M. Davis, J. Wiley and Sons Inc., Hoboken, New Jersey, US.
- 2) Methods in Molecular Biology: 3D Cell Culture, Zuzana Koledova (Editor), Humana Press (2017);
- 3) The immortal life of Henrietta Lacks by Rebecca Skloot, (2010), Crown Publishers New York,
- 4) Textbook of drug design and discovery (2016), 5th Edition, K. Stromgaard, P Krogsgaard-Larsen, Ulf Madsen (editors), CRC Press,
- 5) Methods in Molecular Biology, Vaccine design, S. Thomas (editor), Springer, New York

### **Course content-related study coaching**

Teacher and assistant available for student counseling

### **Assessment moments**

end-of-term and continuous assessment

### **Examination methods in case of periodic assessment during the first examination period**

Written assessment, Assignment

### **Examination methods in case of periodic assessment during the second examination period**

Written assessment, Assignment

### **Examination methods in case of permanent assessment**

Participation, Assignment

### **Possibilities of retake in case of permanent assessment**

examination during the second examination period is not possible

### **Extra information on the examination methods**

Lectures: written examination

Practical: written assignment and participation

### **Calculation of the examination mark**

Lectures: 90% and practical 10%

Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.