

## Plant Biotechnology (I002611)

**Cursusomvang** *(nominale waarden; effectieve waarden kunnen verschillen per opleiding)*

**Studiepunten 5.0** **Studietijd 150 u**

**Aanbodsessies en werkvormen in academiejaar 2024-2025**

A (semester 2)	Engels	Gent	practicum peer teaching groepswerk werkcollege hoorcollege
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**Lesgevers in academiejaar 2024-2025**

Pauwels, Laurens	LA25	Verantwoordelijk lesgever
Bauters, Lander	LA25	Medewerker

**Aangeboden in onderstaande opleidingen in 2024-2025**

	stptn	aanbodsessie
<a href="#">Master of Science in Bioinformatics (afstudeerrichting Bioscience Engineering)</a>	5	A
<a href="#">International Master of Science in Agro- and Environmental Nematology</a>	5	A
<a href="#">Master of Science in Bioscience Engineering: Cell and Gene Biotechnology</a>	5	A
<a href="#">Master of Science in de industriële wetenschappen: biochemie</a>	5	A
<a href="#">Uitwisselingsprogramma bio-ingenieurswetenschappen: cel- en genbiotechnologie (niveau master-na-bachelor)</a>	5	A
<a href="#">Uitwisselingsprogramma bio-ingenieurswetenschappen: landbouwkunde (niveau master-na-bachelor)</a>	5	A
<a href="#">Uitwisselingsprogramma Bioinformatics (niveau master)</a>	5	A

**Onderwijstalen**

Engels

**Trefwoorden**

Plant transformation, applications of transgenic plants, legislation, societal and ethical aspects

**Situering**

The student will become familiar with different techniques used for plant transformation. Several case studies will be discussed with the focus on regulation, usefulness, risk analysis, social aspects, etc.

**Inhoud**

- I. Plant transformation
  - I.1. Plant transformation and regeneration: the basis
  - I.2. Agrobacterium mediated plant transformation
  - I.3. Direct Gene Transfer (DGT) methods
  - I.4. Expression of transgenes in plants
  - I.5. Inactivation of plant genes
  - I.6. New breeding techniques
  - I.7. Safety
- II. Applications
  - II.1. Herbicide resistance
  - II.2. Insect resistance
  - II.3. Virus biology and resistance
  - II.4. Disease resistance & tolerance to abiotic stress
  - II.5. Yield and quality
  - II.6. Non-food & pharming

## II.7. GMO regulations and discussions

Lab exercises: DNA analysis of transgenic plants, transient transformation. PC-practicals.  
Group work and presentations.

### **Begincompetenties**

Knowledge of biochemistry, molecular biology, and plant biology

### **Eindcompetenties**

- 1 being aware of different possible techniques to improve plants: breeding, mutagenesis, transgenesis, cisgenesis, new breeding technologies...
- 2 distinguish the different applications of GMOs in agriculture and be aware of the commercially available products
- 3 substantiate the possibilities of using plants for the production of enzymes, fine chemicals, pharmaceuticals, etc.
- 4 understand the definitions of GMO, event, etc. especially in a regulatory context
- 5 discuss the regulatory steps needed before GMO commercialisation
- 6 critically evaluate scientific papers on GMOs including safety studies
- 7 compare transformation technologies for the development of improved plants
- 8 assess risks and benefits of specific GMO applications
- 9 discuss on genetic engineering applications with scientific arguments and in a multidisciplinary context
- 10 assess new scientific developments on genetic engineering and applications in a scientific and socio-economic context
- 11 adopt a positive attitude towards independent and life long learning
- 12 have good social and communicative skills to function in a team
- 13 appreciate the public opinion and the GMO discussion
- 14 formulate, based on scientific data, a personal opinion on GMO applications without disrespect for a different opinion of others
- 15 critically analyse massive amounts of often contradictory web based information and integrate this with scientific data to come to a scientifically sound conclusion

### **Creditcontractvoorwaarde**

Toelating tot dit opleidingsonderdeel via creditcontract is mogelijk mits gunstige beoordeling van de competenties

### **Examencontractvoorwaarde**

Dit opleidingsonderdeel kan niet via examencontract gevolgd worden

### **Didactische werkvormen**

Groepswerk, Werkcollege, Hoorcollege, Practicum, Peer teaching

### **Toelichtingen bij de didactische werkvormen**

Besides the lectures, several aspects of GMO applications and the public GM debate are being discussed in class. During the microteaching each group of 4 students searches for information on a specific topic, which is then presented for and discussed and evaluated by the whole group. This process also uses peer evaluation.

### **Studiemateriaal**

Geen

### **Referenties**

### **Vakinhoudelijke studiebegeleiding**

Extra information and explanation can be obtained through e-mail, personal contact or UFORA

### **Evaluatiemomenten**

periodegebonden en niet-periodegebonden evaluatie

### **Evaluatievormen bij periodegebonden evaluatie in de eerste examenperiode**

Mondelinge evaluatie, Schriftelijke evaluatie met open vragen

### **Evaluatievormen bij periodegebonden evaluatie in de tweede examenperiode**

Mondelinge evaluatie, Schriftelijke evaluatie met open vragen

### **Evaluatievormen bij niet-periodegebonden evaluatie**

Participatie, Peer en/of self assessment, Werkstuk

### **Tweede examenkans in geval van niet-periodegebonden evaluatie**

Examen in de tweede examenperiode is niet mogelijk

(Goedgekeurd)

### **Eindscoreberekening**

The evaluation of the theory counts for 3/4, the permanent evaluation of the exercises, microteaching and participation for 1/4.

The permanent evaluation score of the first exam session stays valid for the resit.

Students who eschew periodic and/or permanent evaluations for this course unit may be failed by the examiner. The score is then max. 8/20.