

Plant Biotechnology (I002611)

Wegens Covid19 kan mogelijk afgeweken worden van de onderwijs- en evaluatievormen. Dergelijke afwijkingen zullen via Ufora worden gecommuniceerd.

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

Studiepunten 5.0 **Studietijd** 150 u **Contacturen** 50.0 u

Aanbodsessies en werkvormen in academiejaar 2021-2022

A (semester 2)	Engels	Gent	hoorcollege	25.0 u
			groepswerk	7.5 u
			werkcollege: PC- klasoefeningen	3.75 u
			practicum	5.0 u
			microteaching	8.75 u

Lesgevers in academiejaar 2021-2022

Gheysen, Godelieve	LA25	Verantwoordelijk lesgever
Höfte, Monica	LA21	Medelesgever

Aangeboden in onderstaande opleidingen in 2021-2022

	stptn	aanbodsessie
Master of Science in Bioinformatics (afstudeerrichting Bioscience Engineering)	5	A
International Master of Science in Agro- and Environmental Nematology	5	A
Master of Science in de industriële wetenschappen: biochemie	5	A
Master of Science in Bioscience Engineering: Cell and Gene Biotechnology	5	A
Uitwisselingsprogramma Bioinformatics (niveau master)	5	A
Uitwisselingsprogramma bio-ingenieurswetenschappen: landbouwkunde (niveau master-na-bachelor)	5	A
Uitwisselingsprogramma bio-ingenieurswetenschappen: cel- en genbiotechnologie (niveau master-na-bachelor)	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, hoorcollege, microteaching, practicum, hoorcollege: plenaire oefeningen, werkcollege: PC-klasoefeningen

Toelichtingen bij de didactische werkvormen

Besides the lectures, several aspects of GMO applications and the public GM debate are being discussed in class and on the online forum. 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.

Leermateriaal

A compact syllabus is available. Powerpoint presentations and movies explaining basic principles are available on UFORA.

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

Schriftelijk examen met open vragen, mondeling examen

Evaluatievormen bij periodegebonden evaluatie in de tweede examenperiode

Schriftelijk examen met open vragen, mondeling examen

Evaluatievormen bij niet-periodegebonden evaluatie

Participatie, werkstuk, peer-evaluatie, verslag

Tweede examenkans in geval van niet-periodegebonden evaluatie

Examen in de tweede examenperiode is niet mogelijk

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.