

# Le Master de Biologie Végétale Mention PLANT-Int / Plant Science

**UGA**  
Université  
Grenoble Alpes



UNIVERSITÀ  
DEGLI STUDI  
DI MILANO

**LA STATALE**

**CHEMISTRY  
BIOLOGY  
HEALTH**  
Grenoble Graduate School

**gral**  
Grenoble Alliance for Integrated  
Structural & Cell Biology

 **Erasmus+**

**La Région**   
Auvergne-Rhône-Alpes

UNIVERSITÉ  
FRANCO  
ITALIENNE

UNIVERSITÀ  
ITALO  
FRANCESE

**Forum Licences Pro & Masters,  
3 mars 2022**

**C. Carles, F. Courtois, G. Tichtinsky**

# Master de Biologie Végétale

Coord.: Christel CARLES



# Master de Biologie

Coord.: Alain BUISSON



UGA + INPG

M2

**PLANTA International**  
Plant Sciences



**NNN**  
Nanoscience and Nano technology



**PhEDC**  
Physiology  
Epigenetics  
Development  
Differentiation



**NN**  
Neurosciences  
Neurobiology



**ISB**  
Integrative  
Structural  
Biology



**IMID**  
Immunology  
Microbiology  
Infectious Dis.



« Professional » M2

**LST**  
Lab  
Science  
Trading



**BioTechCO**  
Biologie,  
Chimie,  
Commerce  
(alternance)



M1

**Double  
Diploma**  
UGA / UniMi



Molecular and Cellular  
Biology (MCB)



**Bachelor (L3)**

# Objectifs de la formation

- ❖ Former des scientifiques en **Sciences Végétales** → carrière dans secteurs universitaire/privé
- ❖ Favoriser le développement d'un **réseau scientifique et professionnel international**



## Tous modèles végétaux



***Large choix de cours dans plusieurs disciplines*** Biologie cellulaire, génétique moléculaire, biochimie, physiologie cellulaire, biostatistiques, sciences appliquées

***Méthodes pédagogiques innovantes :***  
Projets, travaux collaboratifs, tutorats, stages

***Modularité et complémentarité***

**Offre de formation complémentaire UGA/UniMi**  
Enseignement & évaluation possibles à distance

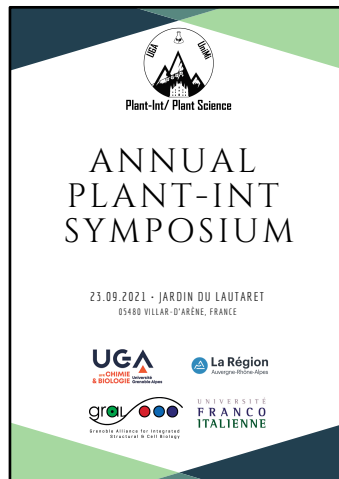


## ➤ Formation Internationale, double diplôme (UGA / UniMi)

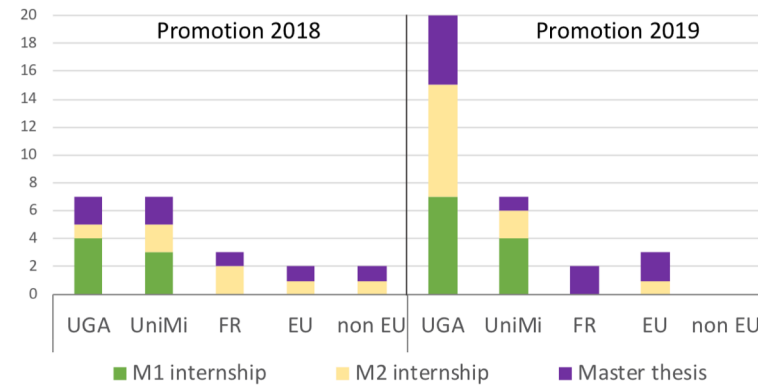
- ❖ **M1:** enseignement au **Semestre 1** à l'**UGA**, au **Semestre 2** à l'**UniMi**
- ❖ **M2:** "à la carte" (UGA ou UniMi ou ailleurs ; enseignement & évaluation possibles à distance)

## ➤ 3 stages avec mobilité fortement recommandée

## ➤ Colloque scientifique annuel avec les laboratoires d'accueil grenoblois & milanais



Lieux de stage



## ➤ Soutien financier à la mobilité des étudiants

- Bourses de mobilités étudiante
- Bourses d'études





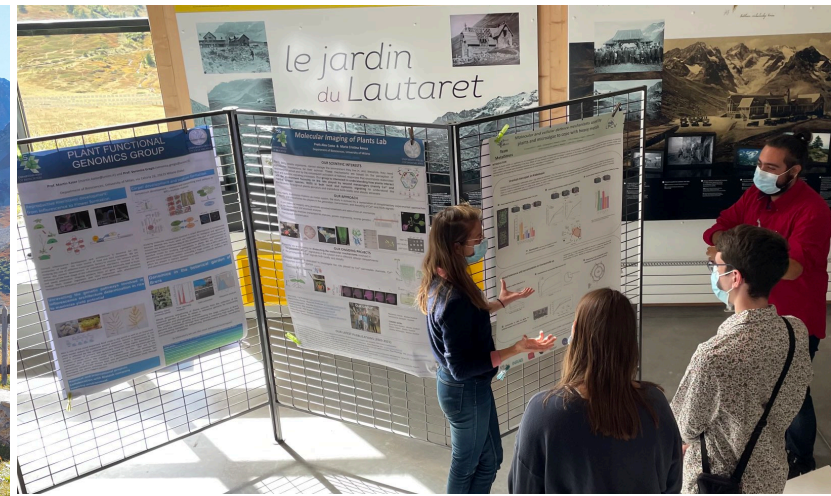
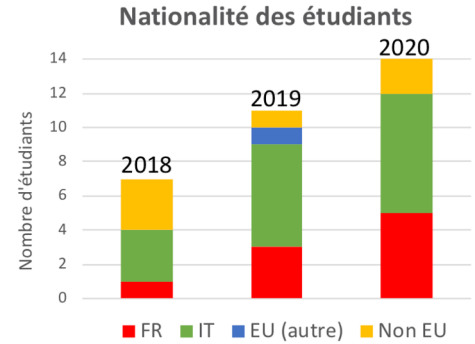
# Points forts du Master PLANT-Int

## ✓ Attractivité & Internationalisation

- Des promos d'une vingtaine d'étudiants
- Etudiants originaires d'Europe et au-delà (France, Italie, Venezuela, Bolivie, Costa-Rica, Macédoine, Inde, ...)

## ✓ Professionnalisation et poursuite d'études

- 3 stages : domaines variés, labos publics/entreprises, France/Italie/autres pays
- Soutien à la mobilité géographique
- Colloque scientifique annuel
- Doctorat en Sciences végétales



# Coordinateurs



## PLANTA International (PLANT-Int)

UGA Coordinators



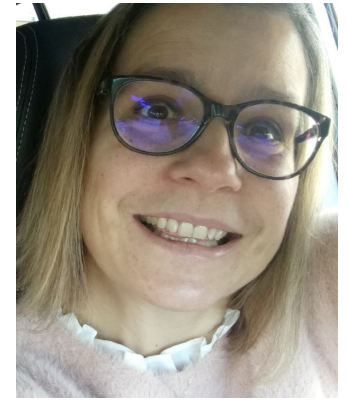
Christel Carles



Florence Courtois



Gabrielle Tichtinsky



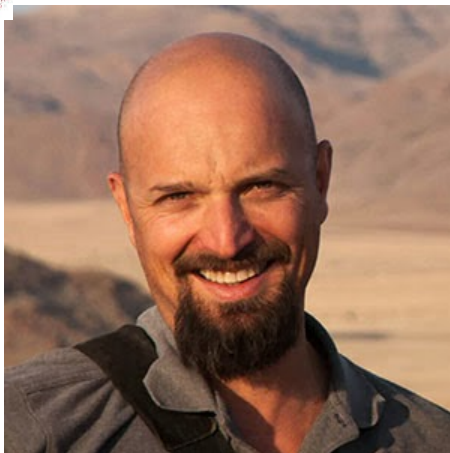
Sylvie Canavesio

UGA Clerical Assistant



## Plant Science Master

UniMi Coordinators



Luca Gianfranceschi



Paolo Pesaresi

PLANT-Int email contact:  
[ufrchimiebiologie-masterplantint@univ-grenoble-alpes.fr](mailto:ufrchimiebiologie-masterplantint@univ-grenoble-alpes.fr)

# Les campagnes e-candidat 2022 pour le Master de Biologie Végétale PLANTA-International

## **Campagne 2 :**

- Ouverture de campagne sur e-candidat : **Du 28 mars au 15 avril 2022**
- Publication des résultats sur E-Candidat : Le **30 mai 2022**

## **Campagne 3 :**

- Ouverture de campagne sur e-candidat : **Du 25 avril au 13 mai 2022**
- Publication des résultats sur E-Candidat : Le **17 juin 2022**

PLANT-Int email contact: [ufrchimiebiologie-masterplantint@univ-grenoble-alpes.fr](mailto:ufrchimiebiologie-masterplantint@univ-grenoble-alpes.fr)





# PLANTA International (PLANT-Int) / Plant Science



## More information on our websites:

[Master in biology](#) at UGA

[Catalogue de formation](#) de l'UGA

[Biosciences](#) at uniMi

UGA Université Grenoble Alpes CATALOGUE DES FORMATIONS

Recherche par diplôme Recherche par disciplines Recherche par facultés, écoles, instituts

# - CATALOGUE 2021 - MASTER - MASTER BIOLOGIE VÉGÉTALE

Master Biologie végétale

MOTEUR DE RECHERCHE Mots-clés: Mots-clés Recherche avancée OK

La formation propose le ou les parcours suivants :

- PARCOURS PLANTA INTERNATIONAL

Présentation

MAJORS > PLANTA INTERNATIONAL (PLANT-INT)

PLANTA International (PLANT-Int)

MAJORS

- Immunology Microbiology Infectious Diseases (IMID)
- Integrated Structural Biology (ISB)
- LabScience Trading (LST)
- Neurobiology Neurosciences
- Physiology Epigenetics Differentiation & Cancer (PhEDC)
- PLANTA International (PLANT-Int)
  - PLANT-Int Teaching Program
  - Application to PLANT-Int
  - Commuting between Grenoble and Milan
  - Internships
  - Events

CONTACT

Generic email address: [ufrchimiebiologie-master-plantint@univ-grenoble-alpes.fr](mailto:ufrchimiebiologie-master-plantint@univ-grenoble-alpes.fr)

PLANT-Int Academic Coordinator: **Christel Carles** (for course enquiries) [christel.carles@univ-grenoble-alpes.fr](mailto:christel.carles@univ-grenoble-alpes.fr)

PLANT-Int Clerical Assistant: [ufrchimiebiologie-master-plantint@univ-grenoble-alpes.fr](mailto:ufrchimiebiologie-master-plantint@univ-grenoble-alpes.fr)

Objectives

The PLANT-Int major of the Master's in Biology focuses on **Plant Science**. PLANT-Int trains future scientists for academic or private careers in **plant biology and plant biotechnology**.

This new major will welcome its first students for the academic year 2018-19 in september 2018.

ZOOM

Article "Algal remodeling in a ubiquitous planktonic photosymbiosis"

LINKS TO...

- The UNIMI PLANT-Int website
- The UGA teaching catalogue
- Région Auvergne-Rhône-Alpes
- 2018-2019 Plant-Int Student's guide
- Plant Int Brochure

NEWS

All the information about the 2019 colloquium by following this link

UNIVERSITÀ DEGLI STUDI DI MILANO bioscienze.bio DBS teaching, research & more

Dipartimento di Bioscienze Dipartimento di Eccellenza

Department of Excellence Workshop

Feb. 24 Day 1 Feb. 25 Day 2 Feb. 26 Day 3

HOME DIDATTICA RICERCA III MISSIONE PhD PIATTAFORME SEMINARI POSIZIONI MOBILITA' INTERNAZIONALE

MASTER DEGREE IN PLANT SCIENCE (Classe LM-6)

### Presentation

The Master's degree course in **Plant Science** is the result of an agreement between the University of Milan (UNIMI) and the University of Grenoble-Alpes (UGA), France. The master course is a collaborative effort planned to allow students to achieve two Master degrees, one from UNIMI and one from UGA. The agreement



# Programme d'enseignement

1<sup>ère</sup> année



## Master 1re année

### o Semestre 7 (à l'UGA)

- **UE Introduction to Plant development and Signaling** 6 crédits ECTS
- **UE Evolutionary biology of plants** 6 crédits ECTS
- **UE Strategies in experimental biology** 12 crédits ECTS
- **UE Advanced scientific english / FLE / Italian** 3 crédits ECTS

1 option(s) au choix parmi 3

- **UE Communication tools** 3 crédits ECTS
- **UE Business Plan of Your start-up** 3 crédits ECTS
- **UE Knowledge of Company** 3 crédits ECTS

### o Semestre 8 (à l'UNIMI)

- **UE Plant development part II** 6 crédits ECTS
- **UE Plant signal transduction part II** 6 crédits ECTS
- **UE Laboratory stage** 6 crédits ECTS

2 option(s) au choix parmi 5

- **UE Plant ecology** 6 crédits ECTS
- **UE Advanced plant cell biotechnology** 6 crédits ECTS
- **UE Plant metabolic engineering and nutrigenomics** 6 crédits ECTS
- **UE Development of crop ideotypes** 6 crédits ECTS
- **UE Molecular plant breeding and genetics** 6 crédits ECTS

UE « vertes »  
spécifiques,  
obligatoires

UE « vertes »  
optionnelles

UE  
mutualisées  
avec d'autres  
Masters  
(UGA, UniMi)



# Programme d'enseignement

## 2<sup>ème</sup> année

UE toutes mutualisées (UGA, UniMi)



### o **Semestre 9**

3 option(s) au choix parmi 13

- **UE Evolution and development of Eukaryotes** 6 crédits ECTS
- **UE Epigenetics and cell differentiation** 6 crédits ECTS
- **UE Chemistry and Cellular Biochemistry** 6 crédits ECTS
- **UE Molecular Genetics and Epigenetics of the Cell** 6 crédits ECTS

- **UE Functional genomics (UNIMI)** 6 crédits ECTS
- **UE Molecular bioinformatics (UNIMI)** 6 crédits ECTS

- **UE Biostatistics, Bioinformatics, Modeling , Part II** 6 crédits ECTS
- **UE High throughput Biology** 6 crédits ECTS

- **UE Patenting and technology transfer (UNIMI)** 6 crédits ECTS
- **UE Environmental plant biochemistry and Physiology (UNIMI)** 6 crédits ECTS
- **UE Basic statistics and Experimental Design** 6 crédits ECTS
- **UE Molecular and Cellular Imaging (UNIMI)** 6 crédits ECTS
- **UE Laboratory Methods for Biodiversity (UNIMI)** 6 crédits ECTS

- **UE Internship I** 12 crédits ECTS

### o **Semestre 10**

- **UE Internship II** 24 crédits ECTS

1 option(s) au choix parmi 14

## Testimonies



"The PLANTA-International master proposes exactly what I was looking for: a programme in plant sciences taught in English, in an international context and with students from different cultures; the possibility to study abroad, with a tempting exchange programme in Italy; a wide number of optional courses that respond to every student's needs; and the possibility to carry out numerous internships throughout the programme."

**Jhoanell, from Venezuela**



"UGA is known for the quality of the administered courses, the rigorous educational support and the strong presence of its graduates on the labor market. The PLANT-Int programme motivated me for two reasons. First, I identified different subjects that I would like to expand my knowledge on. Second, my studies allowed me to acquire the necessary bases needed to follow the program."

**Hamza, from Morocco**



"The PLANT-Int Master program from UGA caught my attention for its international curriculum. I am certain that it will definitely open up many opportunities for my personal and professional future, in a context where language should not be a constraint. Not many Master programmes with this feature are being offered currently and even less between two distinguished European Universities."

**Andrea, from Bolivia**

## Contact Information

### Academic coordinator of the PLANTA-International Master's Degree

■ Christel Carles  
[christel.carles@univ-grenoble-alpes.fr](mailto:christel.carles@univ-grenoble-alpes.fr)

### Generic email address

■ [ufrchimiebiologie-master-plantint@univ-grenoble-alpes.fr](mailto:ufrchimiebiologie-master-plantint@univ-grenoble-alpes.fr)

### WEBSITES

#### PLANT-Int:

<https://master-biologie.univ-grenoble-alpes.fr/parcours/planta-international-plant-int/>

UGA: [www.univ-grenoble-alpes.fr](http://www.univ-grenoble-alpes.fr)

UniMi: [www.unimi.it](http://www.unimi.it)

#### UniMi's Department of Bioscience:

<https://bioscienzebio.unimi.it/ps.php>



La Région  
Auvergne-Rhône-Alpes



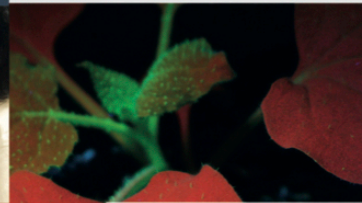
UNIVERSITÀ  
DEGLI STUDI  
DI MILANO  
LA STATALE

UFR de Chimie  
et de Biologie  
UNIVERSITÉ  
Grenoble  
Alpes

## INTERNATIONAL MASTER'S DEGREE

# PLANTA - International (PLANT-Int) MASTER IN BIOLOGY

Double Degree between  
Université Grenoble Alpes  
(UGA)  
and  
Università degli Studi  
di Milano (UniMi)



UFR de Chimie  
et de Biologie  
UNIVERSITÉ  
Grenoble  
Alpes

The PLANTA-International (PLANT-Int) programme is a major of the Master in Biology of Université Grenoble Alpes (UGA).

## Objectives

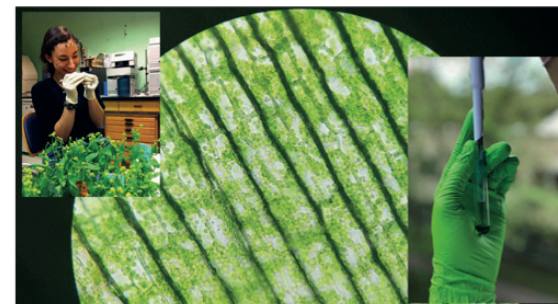
The PLANT-Int programme leads to a **double Master's Degree diploma** delivered by **UGA** and Università degli Studi di Milano (**UniMi**).

PLANT-Int focuses on plant sciences. It aims at training **future scientists for academic and private careers** in plant biology and plant biotechnologies, providing them with advanced scientific and technological expertise in an international context.

This programme relies on the excellence and complementarity of UGA and UniMi, two institutions hosting internationally renowned laboratories with a long tradition of research in plant sciences.

Teaching is carried out in English and offers a large panel of options and internships that allow a **customized study plan** for each student.

The **trans-disciplinary teaching programme** includes lectures in molecular genetics and epigenetics, bioengineering, mathematics for modelling of biological systems, communication and professional insertion tools. Specialised lectures focus on specific aspects of plant development, evolution of the green lineage, agroenergy, metabolism and photosynthesis.



## Programme

Organisation of the PLANT-Int Master is shared between UGA and UniMi: students enter a **mobility programme**, spending the first semester in Grenoble and the second one in Milan. The 2<sup>nd</sup> year is mostly dedicated to internships, including the Master Thesis.

SEMESTER	LOCATION	COURSES
S1	GRENOBLE	Evolutionary Biology of Plants ; Plant Development & Signaling (I) ; Strategies in Experimental Biology ; Scientific English + Optional choices
S2	free choice	INTERNSHIP 1 (8 WEEKS)
	MILAN	Plant Development & signaling (II) + optional choices
S3	free choice	INTERNSHIP 2 (8 - 16 WEEKS)
		Optional choices
S4	free choice	MASTER INTERNSHIP (6 MONTHS)
		Optional choices

## Internships

**Three mandatory internships** are to be completed over the course of the 4 semesters:

- a 2-month mandatory internship at UGA or UniMi (laboratory internship) at S2
- a 3-month internship in an academic laboratory or in a private company at S3
- a 6-month internship in an academic laboratory or in a private company at S4

## Application

- PLANT-Int is open to any undergraduate student holding a Bachelor of Sciences in Biology, Chemistry or equivalent.
- B2-level English proficiency is expected.
- Students may apply to the PLANT-Int programme from either UGA or UniMi as home institution.



**Pour compléter ces informations :**

[Site web du master](#)

[https://master-biologie.univ-grenoble-alpes.fr/parcours/planta-international-plant-int-/](https://master-biologie.univ-grenoble-alpes.fr/parcours/planta-international-plant-int/)

[Catalogue des formations UGA](#)

<https://formations.univ-grenoble-alpes.fr/fr/catalogue-2021/master-XB/master-biologie-vegetale-KISWRTVR.html>

# **DETAILS ON THE TEACHING PROGRAM**

# PLANT-Int

## Global organisation of the 2 year-program

### Master 1

Semester	Location	Courses
S1	Grenoble	Evolutionary Biology of Plants Plant Development & Signaling Strategies in Experimental Biology Scientific English + Optional choices

Jan-Feb	Free choice	Internship 1 (6-8 weeks)
---------	-------------	--------------------------

S2	Milan	Plant Development Plant Signal Transduction Optional choices
----	-------	--

### Master 2

Semester	Location	Courses
S3	Free choice	Internship 2 (8-16 weeks)
		Optional choices

S4	Free choice	Master Internship (6 months)
		Optional choices

You must:

- choose your optional courses
- find internship positions
- design the optimal study plan

*How to accord wishes, proposed options and compatible planning and locations?*

# PLANT-Int Teaching program

## Master 1



### SEMESTER 1

#### Compulsory courses:

Introduction to Plant development and Signal transduction
Evolutionary Biology of Plants
Strategies in Experimental biology

#### 1 course equal to 3 ECTS, to be chosen among these two:

Communication tools
Entrepreneurship in Science

#### 1 language course equal to 3 ECTS, to be chosen:

English
French
Italian

### SEMESTER 2

#### Internship 1 (6-7 weeks)

#### Compulsory courses:

Plant development
Plant Signal transduction

#### 2 courses (6 ECTS each), to be chosen among the following list:

Plant ecology
Advanced Plant Cell Biotechnology
Development of crop Ideotypes
Molecular plant breeding and Genetics





# PLANT-Int Teaching program

## Master 2

### SEMESTER 3

#### Internship 2 (2-3 months, part-time)

3 courses (6 ECTS each),  
to be chosen among these of the following list:

Evo-Devo and the green lineage
Epigenetics and cell differentiation
Chemistry and Cellular Biochemistry
Molecular genetics and epigenetics of the cell
Photobiology and bioenergy
Functional genomics
Molecular bioinformatics
Biostatistic, Bioinformatics and Modeling
High-throughput Biology
Patenting and technology transfer
Environmental plant biochemistry and Physiology
Molecular and Cellular Imaging
Basic Statistics and Experimental design

### SEMESTER 4

#### Master thesis nternship 1 (6 months)

+ 1 elective course equal to 6 ECTS,  
to be chosen among the courses offered at S1, S2 and S3.



# PRE-REQUISITES for M1 PLANT-Int students

## Concepts and words you should know when you start PLANT-Int:

### Cell Biology

Structure and function of a bacterial cell, an Eukaryotic cell, a plant cell  
Functions and ultra-structures of a chloroplast, a mitochondria  
General structure of a nucleus (Nuclear envelope, nuclear pore, nucleolus)

### Genetics and molecular biology

Mendelian Genetics  
Chromatin structure (nucleosome, histones octamer)  
General structure of a gene, of RNA  
DNA Replication (the semi conservative mode)  
Transcription (Preinitiation complex of transcription, RNA initiation and elongation)  
RNA maturation (5' capping, polyadenylation) and translation mechanisms  
Regulation of gene expression  
Enhancer, transcription factor  
Splicing factor  
Differences between genomic DNA, cDNA and CDS (or Open Reading Frame)

### Plant Development and Physiology

Morphology and Functional Anatomy  
Growth and development  
Reproduction modes, Double Fertilization  
Meristem, sporophyte, gametophyte

### Techniques:

Molecular cloning, PCR, RT-qPCR  
Southern blot, northern blot, western blot, immunofluorescence staining  
*in situ* hybridization to detect DNA or RNA molecules

## Books

(available at the UGA Science Library):

“The Cell – A molecular approach”, G.M. Cooper & R.E. Hausman 2016  
“Molecular Biology of the Cell” B. Alberts & A. Johnson 2015 (6<sup>th</sup> ed)

“Genetics – A conceptual Approach”, B.A. Pierce 2005  
“Fundamental genetics”, J. Ringo 2004  
“Molecular Biology” D. Clark 2005  
“Molecular Biology of the gene”, J.D. Watson & T.A. Baker 2008 (6<sup>th</sup> ed)  
Lewin’s “Genes XI” 2008  
“Encyclopedic dictionary of genetics, genomics and proteomics” G.P. Rédei 2009  
“Epigenetics” 2007, eds. Allis, Caparros, Jenuwein, Reinberg

“Plant Physiology & Development”, L. Taiz, E. Zeiger 2014

“Biochemie” Voets 2016