# Plant Genetics and Development

<table>
<thead>
<tr>
<th>Identification number</th>
<th>Workload</th>
<th>Credit points</th>
<th>Term of studying</th>
<th>Frequency of occurrence</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>MN-B-SM (PD 1)</td>
<td>360 h</td>
<td>12 CP</td>
<td>1st or 2nd term of studying</td>
<td>Summer term, 1st half</td>
<td>7 weeks</td>
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</tbody>
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<thead>
<tr>
<th>Type of lessons</th>
<th>Contact times</th>
<th>Self-study times</th>
<th>Intended group size</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Lectures</td>
<td>9 h</td>
<td>18 h</td>
<td>max. 3</td>
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<tr>
<td>b) Practical/Lab</td>
<td>166 h</td>
<td>140 h</td>
<td>max. 1</td>
</tr>
<tr>
<td>c) Seminar</td>
<td>3 h</td>
<td>24 h</td>
<td>max. 1</td>
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## 2 Aims of the module and acquired skills

Students who successfully completed this module …

- have acquired detailed knowledge on principles and methods used in plant genetics and plant molecular biology as well as about approaches to study plant development.
- have obtained an understanding of the principles of evo-devo as the basis of exploring the evolution of traits such as flowering, flower and fruit development, axillary meristem formation and stamen maturation.
- are able to independently plan, carry out and evaluate small scientific projects related to the topics of the module.
- have learned how to present research results in oral and written form and to critically discuss scientific publications related to the topic of the module on a professional level.
- are able to transfer skills acquired in this module to other fields of biology.

## 3 Contents of the module

- Genetic and phenotypic characterization of mutants
- Expression studies (RT-PCR, in-situ hybridization)
- Linkage mapping
- Generation and characterization of transgenic plants
- Epigenetics
- Long non-coding RNAs
- Micro RNAs
- Mikroscopy

*Explanatory note:* The above list comprises state-of-the-art genetic and molecular techniques that are commonly used in the field of plant genetics and plant molecular biology. Every student participating in this module will be confronted with a large subset of it. The exact content, however, will depend on the 6-week research project the student will work on (lab of Jun.-Prof. Dr. M. Albani: genetics, genomics, mapping by sequencing, plant development and evolution; lab of Prof. Dr. K. Theres: genetics, genomics, plant development; Dr. Angela Hay: genetics, plant development and evolution; Dr. Ivan Acosta: genetics, developmental biology, microscopy).

## 4 Teaching/Learning methods

- Lectures; Practical/Lab (Project work); Seminar; Guidance to independent research; Training on presentation techniques in oral and written form
### Requirements for participation
Enrollment in the Master’s degree course “Biological Sciences”

### Type of module examinations
The final examination consists of three parts: 30 min oral examination about topics of the lectures and the practical/lab part (50 % of the total module mark), oral presentation (25 % of the total module mark) and seminar paper (25 % of the total module mark)

### Requisites for the allocation of credits
Regular and active participation; Each examination part at least “sufficient” (see appendix of the examination regulations for details)

### Compatibility with other Curricula
None

### Significance of the module mark for the overall grade
15 % of the overall grade (see also appendix of the examination regulations)

### Module coordinator
Prof. Dr. Maria Albani, phone 5062-380, e-mail: malbani@uni-koeln.de, albani@mpipz.mpg.de

### Additional information
**Subject module** of the Master’s degree course “Biological Sciences”,
**Focus of research:** (P) Molecular Plant Sciences; (D) Developmental Biology

**Participating faculty:** Dr. I. Acosta, Prof. Dr. M. Albani, Dr. A. Hay, Prof. Dr. K. Theres

**Location:** The module will be held at the MPI for Plant Breeding Research, Carl-von-Linné-Weg 10, 50829 Köln

**Literature:**

**General time schedule:** Week 1-6 (Mon.-Fri.): Lectures, practical/lab and preparation for the seminar talk (topic and date will be arranged individually) as well as writing seminar paper; Week 7 (Mon.-Fri): Preparation for the oral examination

**Note:** The module contains hand-on laboratory work conducted individually and is taught in research laboratories. The module does not contain computer-based practicals/research as a main component.

**Introduction to the module:** March 28, 2018 at 2:00 p.m., MPI for Plant Breeding Research, Carl-von-Linné-Weg 10, 50829 Köln, Seminar room 2

**Oral examination:** May 17, 2019, second/supplementary examination July 26, 2019; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.