

Module Name Plant Genetics and Development						
Type of Module ○ Advanced Module				Module Code Plant Genetics and Development		
Identification Number MN-B-SM (P 2)	Workload 360 h	Credit Points 12 CP	Term 2 nd term of studying	Offered Every Summer term, 1 st half	Start Summer term only	Duration 7 weeks
1	Course Types a) Lectures b) Practical/Lab c) Seminar		Contact Time 9 h 166 h 3 h		Private Study 18 h 140 h 24 h	
2	Module Objectives and Skills to be Acquired Students who successfully completed this module <ul style="list-style-type: none"> • have acquired detailed knowledge on principles and methods used to study plant development including genetics, molecular biology, next generation sequencing and microscopy. • have obtained an understanding of different aspects of plant development including leaf and fruit development, meiosis, and different model species including <i>Arabidopsis</i>, <i>Marchantia polymorpha</i> and <i>Cardamine hirsuta</i>. • 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	Module Content <ul style="list-style-type: none"> • CRISPR/Cas9 gene editing • Confocal laser scanning microscopy • Genetic and phenotypic characterization of mutants • Next generation sequencing approaches • Generation and characterization of transgenic plants • Microscopy and cell biology <p><i>Explanatory note:</i> 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 Prof. M. Tsiantis: leaf development and diversity; lab of Dr. A. Hay: explosive seed dispersal; lab of Dr. H. Nakagami: <i>Marchantia</i> as a model system; lab of Prof. R. Mercier: meiosis).</p>					

4	<p>Teaching Methods</p> <ul style="list-style-type: none"> Lectures; Practical/Lab (Project work); Presentation of scientific papers; Training in independent research and communicating scientific results in oral and written form.
5	<p>Prerequisites (for the Module)</p> <p>Enrollment in the Master's of Science degree course "Molecular Plant and Microbial Sciences"</p> <p>Additional academic requirements</p> <p>Previous attendance of the lecture module Molecular Plant and Microbial Sciences</p>
6	<p>Type of Examination</p> <p>The final examination consists of two parts: Oral examination on topics of lectures (20-30 min; 50 % of the total module mark), written report (50 % of the total module mark)</p>
7	<p>Credits Awarded</p> <p>Regular and active participation; Each examination part at least "sufficient" (see appendix of the examination regulations for details)</p>
8	<p>Compatibility with other Curricula</p> <p>None</p>
9	<p>Proportion of Final Grade</p> <p>12.0 %</p>
10	<p>Module Coordinator</p> <p>Dr. Angela Hay, phone 5062 108, e-mail: hay@mpipz.mpg.de</p>
11	<p>Further Information</p> <p>Participating faculty: Dr. A. Hay, Prof. R. Mercier, Prof. M. Tsiantis, Dr. H. Nakagami</p> <p>Location: The module will be held at the MPI for Plant Breeding Research, Carl-von-Linné-Weg 10, 50829 Köln</p> <p>Literature:</p> <ul style="list-style-type: none"> Griffiths, A.J.F., Doebley, J., Peichel, C., Wassarman, D.A. (2020) Introduction to Genetic Analysis. 12th edition, MacMillan Leyser, O., Day, S. (2003) Mechanisms in Plant Development. Blackwell Publishing <p>General time schedule: Weeks 1-6 (Mon.-Fri.): Lab project; Weeks 1-4 (Mon.-Fri.): One lecture per week; Week 5: Journal club (topic and date will be arranged individually); Week 6: Preparation for oral examination; Week 7 (Mon.-Fri): Oral examination; Complete written report by end of Week 9.</p> <p>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.</p> <p>Introduction to the module: April 7, 2025 at 13:00, MPI for Plant Breeding Research, Carl-von-Linné-Weg 10, 50829 Köln, Seminar room CS-E11 or online (in this case, further information/link will be sent to your Smail-Account)</p> <p>Oral examination: May 23, 2025, second/supplementary examination August 15, 2025; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.</p>