

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	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	Planned Group Size max. 4 max. 1 max. 4	
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, fruit and stamen development and meiosis. • 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"> • Genetic and phenotypic characterization of mutants • Expression studies • Linkage mapping • Generation and characterization of transgenic plants • Next generation sequencing approaches • CRISPR/Cas9 gene editing • Cell biology • Microscopy • <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. Dr. M. Tsiantis: leaf development and diversity; lab of Dr. A. Hay: explosive seed dispersal; lab of Dr. I. Acosta: stamen development; lab of Prof. Dr. R. Mercier: meiosis). 					

4	Teaching Methods Lectures; Practical/Lab (Project work); Seminar; Guidance to independent research; Training on presentation techniques in oral and written form
5	Prerequisites (for the Module) Enrollment in the Master's degree course "Biological Sciences" Additional academic requirements Previous attendance of the lecture module "Molecular Plant and Microbial Sciences (P)".
6	Type of Examination 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)
7	Credits Awarded Regular and active participation Each examination part at least "sufficient" (see appendix of the examination regulations for details)
8	Compatibility with other Curricula None
9	Proportion of Final Grade 15 % of the overall grade (see also appendix of the examination regulations)
10	Module Coordinator Dr. Angela Hay, phone 5062-108, e-mail: hay@mpipz.mpg.de

11	<p>Further Information</p> <p>Subject module of the Master’s degree course “Biological Sciences”, Specialization: (P) Molecular Plant and Microbial Sciences</p> <p>Participating faculty: Dr. I. Acosta, Dr. A. Hay, Prof. Dr. R. Mercier, Prof. Dr. M. Tsiantis</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., Wessler, F.R., Lewontin, R.C., <i>et al.</i> (2008) An Introduction to Genetic Analysis. 9th edition, W.H. Freeman• Leyser, O., Day, S. (2003) Mechanisms in Plant Development. Blackwell Publishing• Taiz, L., Zeiger, E. (2010) Plant Physiology. 5th edition, Palgrave Macmillan. Chapter 25, pp 719-753 <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; Written lab report due 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 4, 2022 at 11:00 a.m., MPI for Plant Breeding Research, Carl-von-Linné-Weg 10, 50829 Köln, Seminar room 2 or online (in this case, further information/link will be sent to your Smail-Account)</p> <p>Oral examination: May 16, 2022, second/supplementary examination August 05, 2022; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.</p>
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