

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 and microscopy. • have obtained an understanding of different aspects of development and genetics in different plants including <i>Arabidopsis</i>, <i>Cardamine hirsuta</i>, <i>Marchantia polymorpha</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 • <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). 					

4	Teaching Methods Lectures; Practical/Lab (Project work); Presentation of scientific papers; Training in independent research and communicating scientific results 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 12 % 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. 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, W.H. Freeman• Leyser, O., Day, S. (2009) Mechanisms in Plant Development. Wiley-Blackwell <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: March 27, 2023 at 13:00, 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 15, 2023, second/supplementary examination August 04, 2023; 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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