

<b>Module Name</b> Plant Genetics						
<b>Type of Module</b> ○ Advanced Module				<b>Module Code</b> Plant Genetics		
<b>Identification Number</b> MN-B-SM (P 1)	<b>Workload</b> 360 h	<b>Credit Points</b> 12 CP	<b>Term</b> 2 <sup>nd</sup> term of studying	<b>Offered Every</b> Summer term, 1 <sup>st</sup> half	<b>Start</b> Summer term only	<b>Duration</b> 7 weeks
<b>1</b>	<b>Course Types</b> a) Lectures b) Tutorials c) Practical/Lab d) Seminar		<b>Contact Time</b> 20 h 14 h 144 h 5 h		<b>Private Study</b> 30 h 14 h 109 h 24 h	
<b>2</b>	<b>Module Objectives and Skills to be Acquired</b> Students who successfully completed this module <ul style="list-style-type: none"> <li>• have gained in-depth knowledge in up-to-date plant research topics. As this module also includes a section on molecular plant breeding which is co-taught by a plant breeder from a commercial breeding company, students will also gain transferable knowledge.</li> <li>• are trained in modern techniques in advanced molecular biology, biochemistry and cell biology (see contents of the module).</li> <li>• can independently carry out small scientific projects related to the topic of the module.</li> <li>• 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.</li> <li>• are able to transfer skills acquired in this module to other fields of biology.</li> </ul>					
<b>3</b>	<b>Module Content</b> <ul style="list-style-type: none"> <li>• Theory of modern methods in molecular plant sciences (also used in other sciences)</li> <li>• Plant developmental biology</li> <li>• Molecular biology of plant-environment interactions</li> <li>• Biotic interactions (e.g. symbiosis with mycorrhizal fungi)</li> <li>• Protein-protein interactions (e.g. co-immunoprecipitations, FRET, co-localization)</li> <li>• Genetic and molecular analysis of cell-cell communication (mutant analysis, plant transformation)</li> <li>• Cell imaging using fluorescent and confocal microscopy</li> <li>• Analysis of reporter gene activities, particle bombardment</li> <li>• Real-time RT-qPCR to analyze gene expression</li> <li>• Epigenetics, histone modifications</li> <li>• Other methods in modern molecular biology, biochemistry and cell biology</li> <li>• Learning how to write a grant proposal</li> </ul>					

4	<p><b>Teaching Methods</b></p> <ul style="list-style-type: none"> <li>Lectures; Interactive tutorials; Practical/Lab; Seminar; Guidance to independent research; Training on writing and presentation techniques in oral and written forms</li> </ul>
5	<p><b>Prerequisites (for the Module)</b></p> <p>Enrollment in the Master's of Science degree course "Molecular Plant and Microbial Sciences"</p> <p><b>Additional academic requirements</b></p> <p>Previous attendance of the lecture module Molecular Plant and Microbial Sciences</p>
6	<p><b>Type of Examination</b></p> <p>The final examination consists of two parts: One hour written examination on topics of lectures, seminars and the practical/lab part (50 % of the total module mark), oral presentation (20-30 min; 50 % of the total module mark)</p>
7	<p><b>Credits Awarded</b></p> <p>Regular and active participation; Each examination part at least "sufficient" (see appendix of the examination regulations for details)</p>
8	<p><b>Compatibility with other Curricula</b></p> <p>None</p>
9	<p><b>Proportion of Final Grade</b></p> <p>12.0 %</p>
10	<p><b>Module Coordinator</b></p> <p>Prof. Dr. Ute Höcker, phone 470 6897, e-mail: hoeckeru@uni-koeln.de</p>
11	<p><b>Further Information</b></p> <p><b>Participating faculty:</b> Prof. Dr. M. Bucher, Prof. Dr. U. Höcker, Prof. Dr. M. Hülskamp, Dr. F. Turck</p> <p><b>Literature:</b></p> <ul style="list-style-type: none"> <li>Information on recommended textbooks and other reading material will be given on the ILIAS representation of the course (see <a href="https://www.ilias.uni-koeln.de/ilias/goto_uk_cat_2815610.html">https://www.ilias.uni-koeln.de/ilias/goto_uk_cat_2815610.html</a>)</li> </ul> <p><b>General time schedule:</b> Week 1-5 (Mon.-Thu./Fri.): Lectures, tutorials, practical/lab and writing exercises. Week 6 (Mon.-Fri): Preparation for the seminar talk (held at the end of week 6); Week 7 (Mon.-Fri): Preparation for the written examination</p> <p><b>Note:</b> The module contains hands-on laboratory work conducted in groups of max. two people and is taught in a course room fully equipped with up to date research technology. The module does contain computer-based practicals/research as one main component.</p> <p><b>Introduction to the module:</b> April 7, 2025 at 9.00 a.m., Cologne Biocenter, room 4.004 (fourth floor) or online (in this case, further information/link will be sent to your Smail-Account); for preparation to the module before this introduction see ILIAS link under literature.</p> <p><b>Written examination:</b> 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>