

Molecular Plant-Microbe Interactions						
Identification number	Workload	Credit points	Term of studying	Frequency of occurrence	Duration	
MN-B-SM (P 4)	360 h	12 CP	1 st or 2 nd term of studying	Summer term, 2 nd half	7 weeks	
1	Type of lessons		Contact times	Self-study times	Intended group size	
	a) Lectures		12 h	24 h	max. 6	
	b) Practical/Lab		162 h	132 h	max. 1	
	c) Seminar		6 h	24 h	max. 1	
2	Aims of the module and acquired skills					
	Students who successfully completed this module ...					
	<ul style="list-style-type: none"> • have gained in-depth knowledge of state-of-the-art technology for plant-microbe interaction research particularly on plant immune response and its evasion by plant associated microbes as well as different approaches for localization and functional characterization of fungal effector-proteins. • are able to use modern techniques in advanced molecular mycology, biochemistry, basic bioinformatic and genetics (see contents of the module). • can independently carry out small scientific projects related to the topic 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					
	<ul style="list-style-type: none"> • Modern concepts and methods in molecular plant-microbe interactions (also used in other sciences) • Bioinformatic analysis of gene expression data • Bioinformatic analysis/prediction of protein function and structure • Advanced techniques of fluorescence microscopy (confocal microscopy with different staining methods, life-cell-imaging, 3-dimensional projection) including sample preparation (depending on the Corona restrictions) • Plant colonization and disease or growth promotion scoring • Expression and purification of recombinant proteins • Biochemical analyses of beneficial and pathogen-effector proteins • <i>In-vivo</i> detection of plant immune responses and their inhibition by effectors • Basic techniques of molecular cloning (DNA preparation, transformation, ligation, RNA synthesis) • Basic protein techniques (PAGE, Western blotting) 					
4	Teaching/Learning methods					
	<ul style="list-style-type: none"> • Lectures; Practical/Lab (Project work); Seminar; Guidance to independent research; Training on presentation techniques in oral and written form 					
5	Requirements for participation					
	Enrollment in the Master´s degree course "Biological Sciences"					

Molecular Plant-Microbe Interactions (MN-B-SM [P 4]) continued

6	<p>Type of module examinations</p> <p>The final examination consists of three parts: Two hours written 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)</p>
7	<p>Requisites for the allocation of credits</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>Significance of the module mark for the overall grade</p> <p>15 % of the overall grade (see also appendix of the examination regulations)</p>
10	<p>Module coordinator</p> <p>Prof. Dr. Alga Zuccaro, phone 470-7170, e-mail: azuccaro@uni-koeln.de</p>
11	<p>Additional information</p> <p>Subject module of the Master´s degree course "Biological Sciences", Spezialization: (P) Molecular Plant and Microbial Sciences</p> <p>Participating faculty: Prof. Dr. G. Döhlemann, N. Dunken, Dr. G. Langen, Dr. J. Misas-Villamil, Dr. B. Ökmen, Dr. S. Wawra, Prof. Dr. A. Zuccaro</p> <p>Literature:</p> <ul style="list-style-type: none"> • Information about textbooks and other reading material will be given on the ILIAS representation of the course (https://www.ilias.uni-koeln.de/ilias/goto_uk_cat_2815610.html) <p>General time schedule: Week 1-5 (Mon.-Fri.): Lectures, practical/lab and preparation for the seminar talk (seminar presentation will be held in the weeks 4-6); Week 6 (Mon.-Fri): Writing seminar paper; Week 7 (Mon.-Fri): Preparation for the written examination</p> <p>Note: The module contains hand-on laboratory work conducted by small groups of students and is taught in course rooms or research laboratories depending on the number of students. The module does not contain computer-based practicals/research as a main component.</p> <p>Introduction to the module: June 07, 2021 at 10:00 a.m., Cologne Biocenter, room 4.002 (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>Written examination: July 23, 2021, second/supplementary examination August 27, 2021; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.</p>

Corona note! Depending on the Corona situation during the summer term, practical work may be skipped either totally or in part. In this case, some or all practical parts will be replaced by adequate alternatives so that (i) the workload and (ii) the principle content of the modules remained unchanged.