

| Molecular Plant-Microbe Interactions | | | | | |
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| Identification number | Workload | Credit points | Term of studying | Frequency of occurrence | Duration |
| MN-B-SM (PG 2) | 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. 12 |
| | b) Practical/Lab | | 162 h | 132 h | max. 4 |
| | c) Seminar | | 6 h | 24 h | max. 3 |
| 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 • 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" or in the Master´s degree course "Biochemistry" | | | | |

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| 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>Biological subject module in the Master´s degree course "Biochemistry"</p> |
| 9 | <p>Significance of the module mark for the overall grade</p> <p>In the Master´s degree course "Biological Sciences": 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", Focus of research: (P) Molecular Plant Sciences; (G) Genetics and Cell Biology</p> <p>Participating faculty: Prof. Dr. G. Döhlemann, 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"> • Buchanan, B., Gruissem, W., Russell, J. (2002) <i>Biochemistry and Molecular Biology of Plants</i>. Wiley-Blackwell • Agrios, G. (2005) <i>Plant Pathology</i>. 5th edition, Elsevier • Sanchez-Serrano, J.J., Salinas J. (2014) <i>Arabidopsis Protocols</i>. 3rd edition, Springer • Recent review articles on particular topics will be provided prior to the course <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: May 25, 2020 at 10:00 a.m., Cologne Biocenter, room 4.002 (fourth floor)</p> <p>Written examination: July 17, 2020, second/supplementary examination August 28, 2020; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.</p> |

* 11 students from the Master´s degree course "Biological Sciences" and 1 student from the Master´s degree course "Biochemistry".