

Molecular Mechanisms of Human Diseases						
Identification number	Workload	Credit points	Term of studying	Frequency of occurrence	Duration	
MN-B-SM (G 5)	360 h	12 CP	1 st or 2 nd term of studying	Winter term, 1 st half	7 weeks	
1	Type of lessons		Contact times	Self-study times	Intended group size*	
	a) Lectures		28 h	42 h	max. 12	
	b) Practical/Lab		145 h	112 h	max. 3	
	c) Seminar		9 h	24 h	max. 2	
2	Aims of the module and acquired skills					
	Students who successfully complete this module will ...					
	<ul style="list-style-type: none"> • have acquired detailed knowledge on important concepts in modern biomedical research with a focus on key disease mechanisms. • have acquired experimental skills in state-of-the art methodologies in cell biology and molecular biology and 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"> • Mechanisms of human diseases • Model systems for human diseases • Genetic control of tissue regeneration and tumor growth • Basic cell biology – signal transduction in health and disease and molecular mechanisms of pathogenesis • Genetics in model organisms of human disease • Eukaryotic cell culture • DNA analysis by polymerase chain reaction (PCR), quantification of gene expression • Molecular cloning • Gel electrophoresis (agarose and PAGE) and western blotting • Staining methods, immunohistochemistry, microscopy • Principles of high throughput drug discovery 					
4	Teaching/Learning methods					
	<ul style="list-style-type: none"> • Lectures; Practical/Lab (project work); Seminar; Guidance 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"					
6	Type of module examinations					
	The final examination consists of three parts: Two hours written examination over topics of the lectures (50 % of the total module mark), oral presentation (25 % of the total module mark) and seminar paper (25 % of the total module mark)					

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. Björn Schumacher, phone 478-84202, e-mail: bjoern.schumacher@uni-koeln.de</p>
11	<p>Additional information</p> <p>Subject module of the Master's degree course "Biological Sciences", Focus of research: (G) Genetics and Cell Biology</p> <p>Participating faculty: PD Dr. F. Bock, Prof. Dr. P. Brinkkötter, Prof. Dr. S. Eming, Dr. R. Jachimowicz, Prof. Dr. F. Klein, Prof. Dr. R. Müller, Prof. Dr. C. Niessen, Prof. Dr. C. Pallasch, Prof. Dr. S. Rosenkranz, PD Dr. Dr. J. Rybniker, PD Dr. H. Schlösser, Prof. Dr. B. Schumacher</p> <p>Literature:</p> <ul style="list-style-type: none"> • Readings will be provided by the lecturers that cover the key concepts presented in the course and will be available on the course website. <p>General time schedule: Week 1-6 (Mon.-Fri.): Lectures, practical/lab, writing seminar paper and preparation for the oral presentation (held at the end of week 6); Week 7 (Mon.-Fri): Preparation for the written examination</p> <p>Note: The module contains hands-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: October 07, 2019 at 9 a.m., CECAD Research Centre, Joseph-Stelzmann Str. 26, Lecture hall (ground floor)</p> <p>Written examination: November 22, 2019, second/supplementary examination February 14, 2020; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.</p>

*10 students from the Master's degree course "Biological Sciences" and 2 students from the Master's degree course "Biochemistry".