

Molecular Mechanisms of Human Diseases						
Identification number	Workload	Credit points	Term of studying	Frequency of occurrence	Duration	
MN-B-SM (A 2)	360 h	12 CP	1 st or 2 nd term of studying	Summer 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. 10	
	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"					
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>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. 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", Specialization: (A) Mechanisms of Aging and Aging Associated Diseases</p> <p>Participating faculty: PD Dr. F. Bock, Prof. Dr. P. Brinkkötter, Prof. Dr. S. Eming, Dr. R. Jachimowicz, Prof. Dr. C. Niessen, Prof. Dr. C. Pallasch, Dr. M. Rieckher, Prof. Dr. S. Rosenkranz, PD Dr. H. Schlösser, Prof. Dr. B. Schumacher, Dr. S. Theobald, Dr. R. Thomas, Dr. M. Tittgemeyer</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 1-6 (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: April 12, 2021 at 9 a.m., CECAD Research Centre, Joseph-Stelzmann Str. 26, Lecture hall (ground 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: May 31, 2021, second/supplementary examination August 06, 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.