

Module Name Molecular Mechanisms of Human Diseases						
Type of Module ○ Advanced Module				Module Code Human Diseases		
Identification Number MN-B-SM (A 2)	Workload 360 h	Credit Points 12 CP	Term 2 nd term of studying	Offered Every Summer term	Start summer term only	Duration 7 weeks
1	Course Types a) Lectures b) Practical/Lab c) Seminar		Contact Time 28 h 145 h 9 h	Private Study 42 h 112 h 24 h	Planned Group Size max. 15 max. 3 max. 3	
2	Module Objectives and Skills to be Acquired Students who successfully completed this module <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	Module Content <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 Methods Lectures; Practical/Lab (project work); Seminar; Guidance in independent research; Training on presentation techniques in oral and written form					

5	<p>Prerequisites (for the Module) Enrollment in the Master's degree course "Biological Sciences"</p> <p>Additional academic requirements Previous attendance of the lecture module "Principles of Molecular Genetics, Development and Aging (A/D/G)".</p>
6	<p>Type of Examination The final examination consists of two parts: written examination on topics of lectures, seminars and the practical/lab part (1 hour; 50 % of the total module mark), oral presentation (20-30 min; 50 % of the total module mark)</p>
7	<p>Credits Awarded 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 None</p>
9	<p>Proportion of Final Grade 12 % of the overall grade (see also appendix of the examination regulations)</p>
10	<p>Module Coordinator Prof. Dr. Björn Schumacher, phone 478-84202, e-mail: bjoern.schumacher@uni-koeln.de</p>
11	<p>Further 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: Prof. Dr. Miguel Alejandro Alcazar, PD Dr. F. Bock, Prof. Dr. P. Brinkkötter, Prof. Dr. C. Pallasch, Dr. S. Panier, Prof. Dr. B. Pfander, Dr. M. Rieckher, Prof. Dr. B. Schumacher, Dr. S. Theobald, Prof. Dr. David Vilchez, Prof. Dr. Holger Winkels, Prof. Dr. Carien Niessen, Dr. S. Wang, Prof. Dr. Ron Jachimowicz, PD. Dr. Han Schlößer, Prof. Dr. F. Klein, Dr. T. Vuong-Brender.</p> <p>Literature: 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> <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 03, 2023 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 19, 2023, second/supplementary examination August 04, 2023; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.</p>