

Module Name Lecture Principles of Molecular Genetics, Development and Aging						
Type of Module ○ Basic Module				Module Code Aging Lecture		
Identification Number	Workload	Credit Points	Term	Offered Every	Start	Duration
MN-B-GA 1	180 h	6 CP	1 st term of studying	Winter term	Winter term only	1 term
1	Course Types Lecture		Contact Time 49 h		Private Study 131 h	
2	Module Objectives and Skills to be Acquired Students who successfully completed this module <ul style="list-style-type: none"> • have acquired an understanding of principles and mechanisms of molecular and cellular biology and key concepts in modern genetics and aging and regeneration research. • have acquired in-depth knowledge of molecular, cellular and systemic mechanisms that orchestrate development and organismal homeostasis and how their malfunctions contribute to aging and aging-associated diseases. • can solve problems and develop strategies to answer questions related to molecular genetics and mechanisms underlying organismal development, homeostasis and aging. 					
3	Module Content <ul style="list-style-type: none"> • Hallmarks of aging • Eukaryotic, bacterial and viral genome structure and organization • DNA stability, damage and repair, DNA replication and recombination • Regulation of gene expression, transcription, pre-mRNA splicing and epigenetics • Translation, proteostasis and ER stress, including protein folding and posttranslational modification of proteins • Cell cycle and its regulation • Cellular senescence • Organization and function of the cytoskeleton, cellular mechanics • Signal transduction, inter- and intra-cellular communication • Mitochondria biology and function • Cell death • Stem cell biology, regeneration • Defense mechanisms and immunity • Microbiome function and regulation 					
4	Teaching Methods <ul style="list-style-type: none"> • Lecture 					

5	<p>Prerequisites (for the Module) Enrollment in one of the Master's of Science degree courses of the Department of Biology</p> <p>Additional academic requirements The knowledge of cell, molecular and developmental biology as well as genetics on the level of general biology text books (e.g. Alberts, Lodish or Watson) is required.</p>
6	<p>Type of Examination Two hours written examination about topics of the lectures (100 % of the total module mark)</p>
7	<p>Credits Awarded Written examination at least "sufficient"</p>
8	<p>Compatibility with other Curricula* Obligatory lecture module in the Master's Degree course Computational Biology, Optional module for the second (or third) obligatory lecture module in the other Master's of Science degree courses of the Department of Biology</p>
9	<p>Proportion of Final Grade 7.5 %</p>
10	<p>Module Coordinator Prof. Dr. Mirka Uhlirova, phone 478 84334, e-mail: mirka.uhlirova@uni-koeln.de</p>
11	<p>Further Information</p> <p>Participating faculty: Professors and Group Leaders of the Institute for Genetics, Cologne Excellence Cluster on Cellular Stress Responses in Aging-Associated Diseases (CECAD) and the Institute for Zoology</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 (see https://www.ilias.uni-koeln.de/ilias/goto_uk_cat_2815610.html). <p>General time schedule: Weeks 1-14: Lectures Mon. from 11:15 to 13:00 and Thur. from 10:00 to 11:45; Tutorials (voluntary) Wed. from 12:00 – 12:45; Week 15 (Mon.-Fri.): Preparation for the written examination.</p> <p>Introduction to the module: October 09, 2022 at 11:00 a.m. (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: February 09, 2024, second/supplementary examination March 08, 2024; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.</p>