

Seminar in Modern Techniques and Approaches in Aging Research					
Identification number	Workload	Credit points	Term of studying	Frequency of occurrence	Duration
MN-B-A 2	180 h	6 CP	1 st term or higher term of studying	Winter term	15 weeks
1	Type of lessons Seminar/Tutorial		Contact times 45 h	Self-study times 135 h	Intended group size 20
2	Aims of the module and acquired skills Students who successfully completed this module ... <ul style="list-style-type: none"> • have acquired detailed knowledge about the concepts of state-of-the art methods of functional genomics, genetics, cell and molecular biology and imaging and their applications to study and understand cell and tissue functions in physiology and disease. • have learned how to present research results in oral and written form on a professional level. • have learned how to analyze scientific problems and critically discuss scientific publications related to the topics of the module on a professional level. • are able to develop strategies how to solve scientific questions in the field of Aging research. • are able to transfer and apply knowledge and skills acquired in this module to wet-lab setting and related scientific fields. 				
3	Contents of the module <ul style="list-style-type: none"> • Principles of genome engineering (CRISPR-Cas, CRE-Lox, TALENs) • Regulation of nuclear and chromatin architecture (3C, HiC) • Epigenetic regulation of gene expression (repurposed Cas9 and Cas13) • Principles of translational control (Polysome profiling and riboseq) • Fate decisions and functional identity (hESC/iPSC, lineage tracing techniques) • Principles of transcriptional regulation (ChIP-seq, ATAC-seq, DamID, NET/GRO/PRO/START-seq) • Functional genetics in model organisms (haploid screens, genetic epistasis) • Next generation sequencing methods for genomic analyses (RNA-seq, scRNA-seq, snRNA-seq) • Optogenetics and Chemogenetics in model organisms • Microscopy techniques (Light and Superresolution microscopy), immunological staining methods • Mechanobiology, Quantitative Imaging 				
4	Teaching/Learning methods <ul style="list-style-type: none"> • Tutorials, Seminars; Group discussions; Guidance to critical interpretation of literature; Training on presentation techniques in oral and written form 				
5	Requirements for participation Enrollment in the Master's degree course "Biological Sciences"; Simultaneous participation in the lecture module "Principles of Molecular Genetics, Development and Aging"				
6	Type of module examinations Oral presentation (100 % of the total module mark)				

Seminar in Modern Techniques and Approaches in Aging Research (MN-B-A 2) continued

7	<p>Requisites for the allocation of credits</p> <p>Regular and active participation; Passed written proposal; Oral presentation at least "sufficient"</p>
8	<p>Compatibility with other Curricula*</p> <p>None</p>
9	<p>Significance of the module mark for the overall grade</p> <p>7.5 % of the overall grade</p>
10	<p>Module coordinator</p> <p>Prof. Dr. Mirka Uhlirova, phone 478 84334, e-mail: mirka.uhlirova@uni-koeln.de</p>
11	<p>Additional information</p> <p>Participating faculty: Dr. H. Bazzi, Dr. M. Denzel, Dr. M. Graef, Dr. L. Kurian, Dr. A. Schauss, Dr. S. Steculorum, Dr. P. Tessarz, Prof. Dr. M. Uhlirova (external: Dr. A. Rada-Iglesias, Prof. Dr. S. Wickstrom)</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_crs_3516849.html) <p>General time schedule: Weeks 1-14: Seminars/tutorials and oral presentations (starting at 2:00 p.m. at different dates, more details will be given in the introduction to the module).</p> <p>Introduction to the module: November 03, 2020 at 2:00 p.m., online (further information/link will be sent to your Smail-Account); for preparation to the module before this introduction see ILIAS link under literature.</p>