

Modern Techniques of Developmental Biology					
Identification number	Workload	Credit points	Term of studying	Frequency of occurrence	Duration
MN-B-SM (DG 1)	360 h	12 CP	1 <sup>st</sup> or 2 <sup>nd</sup> term of studying	each term, 2 <sup>nd</sup> half	7 weeks
<b>1</b>	<b>Type of lessons</b>		<b>Contact times</b>	<b>Self-study times</b>	<b>Intended group size*</b>
	a) Lectures		12 h	24 h	max. 13
	b) Practical/Lab		162 h	129 h	max. 3
	c) Seminar		9 h	24 h	max. 6
<b>2</b>	<b>Aims of the module and acquired skills</b> Students who successfully completed this module ... <ul style="list-style-type: none"> <li>• have acquired theoretical and experimental skills concerning important techniques in developmental biology (see contents of the module).</li> <li>• can independently carry out small scientific projects related to the topic of the module.</li> <li>• 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.</li> <li>• are able to transfer skills acquired in this module to other fields of biology.</li> </ul>				
<b>3</b>	<b>Contents of the module</b> <ul style="list-style-type: none"> <li>• Genetic analysis of developmental processes</li> <li>• Clonal analysis</li> <li>• Advanced techniques of fluorescence microscopy</li> <li>• Cell transplantations</li> <li>• Cell ablations</li> <li>• Transgenic techniques</li> <li>• RNAi and morpholino knock-down of developmental genes</li> <li>• Life-imaging of morphogenetic processes</li> <li>• Cell migration and intracellular transport of mRNAs and proteins</li> <li>• Basic techniques of molecular cloning (DNA preparation, transformation, ligation, RNA synthesis)</li> <li>• Basic protein techniques (PAGE, Western blotting)</li> </ul>				
<b>4</b>	<b>Teaching/Learning methods</b> <ul style="list-style-type: none"> <li>• Lectures; Practical/Lab (Project work); Seminar; Guidance to independent research; Training on presentation techniques in oral and written form</li> </ul>				
<b>5</b>	<b>Requirements for participation</b> Enrollment in the Master's degree course "Biological Sciences" or in the Master's degree course "Biochemistry" <b>Additionally recommended:</b> Participation in an advanced genetics, cell biology or developmental biology course within a bachelor's program is highly desirable. The knowledge of basic molecular and cell biology on the level of introductory biology or cell biology textbooks (Campbell, Purves, Alberts) is a prerequisite. Basic lab experience (pipetting, preparation of solutions) is presumed.				

6	<p><b>Type of module examinations</b></p> <p>The final examination consists of three parts: Two hours written examination about topics of the lectures and the practical/lab part (50 % of the total module mark), oral presentation (25 % of the total module mark) and seminar paper (25 % of the total module mark)</p>
7	<p><b>Requisites for the allocation of credits</b></p> <p>Regular and active participation; Each examination part at least "sufficient" (see appendix of the examination regulations for details)</p>
8	<p><b>Compatibility with other Curricula</b></p> <p>Biological subject module in the Master's degree course "Biochemistry"</p>
9	<p><b>Significance of the module mark for the overall grade</b></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><b>Module coordinator</b></p> <p>Prof. Dr. Siegfried Roth, phone 470-2491, e-mail: siegfried.roth@uni-koeln.de</p>
11	<p><b>Additional information</b></p> <p><b>Subject module</b> of the Master's degree course "Biological Sciences", <b>Focus of research:</b> (D) Developmental Biology; (G) Genetics and Cell Biology</p> <p><b>Participating faculty:</b> PD Dr. B. Altenhein, Prof. Dr. O. Bossinger, Prof. Dr. M. Hammerschmidt, Prof. Dr. M. Hülskamp, PD Dr. M. Kroiher, Dr. H.-M. Pogoda, Prof. Dr. S. Roth, Prof. Dr. B. Schermer, Prof. Dr. M. Uhlirva, Prof. Dr. W. Werr, Prof. Dr. A. Wodarz</p> <p><b>Literature:</b></p> <ul style="list-style-type: none"> <li>• Gilbert, S.F. (2006) Developmental Biology. 8<sup>th</sup> edition, Sinauer Associates</li> <li>• Wolpert, L., Jessel, T., Lawrence, P. <i>et al.</i> (2006) Principles of Development. 3<sup>rd</sup> edition, Oxford University Press</li> <li>• Review articles on particular topics will be provided during the course.</li> </ul> <p><b>General time schedule:</b> Week 1-5 (Mon.-Fri.): Lectures and practical/lab and preparation for the seminar talk (held in the weeks 4-6); Week 6 (Mon.-Fri): Writing seminar paper; Week 7 (Mon.-Fri): Preparation for the written examination</p> <p><b>Note:</b> The module contains hand-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><b>Introduction to the module:</b> May 29, 2018 at 9:00 a.m., Cologne Biocenter, room 3.002 (third floor)</p> <p><b>Written examination:</b> July 20, 2018; more details will be given at the beginning of the module</p>

\* 12 students from the Master's degree course "Biological Sciences" and 1 student from the Master's degree course "Biochemistry".