

Sensorimotor Integration - Neural Basis of Complex Behavior						
Identification number	Workload	Credit points	Term of studying	Frequency of occurrence	Duration	
MN-B-SM (N 4)	360 h	12 CP	1 st or 2 nd term of studying	Summer term, 2 nd half	7 weeks	
1	Type of lessons		Contact times	Self-study times	Intended group size*	
	a) Lectures		10 h	20 h	max. 8	
	b) Practical/Lab		164 h	132 h	max. 4	
	c) Seminar		10 h	24 h	max. 2	
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 current concepts and experimental models in systems neurobiology. • are trained in behavioral analysis as well as functional neuroanatomy. • are able to apply different electrophysiological recording techniques such as whole-cell patch-clamp recordings, sharp electrode recordings as well as extracellular recordings in semi-intact brain preparations and are able to independently design and perform small scientific projects related to topics 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"> • Behavioral and neuronal analysis of acoustic communication in vertebrates • Behavioral and neuronal analysis of visual guided behavior in vertebrates • Structure and function of the auditory and visual system in vertebrates • Structure and function of respiratory and vocal pathways in vertebrates • Structure and function of basal ganglia and limbic system • Neuroanatomical techniques (<i>i.e.</i> tract tracing, immunohistochemistry, 3D-reconstruction) • Techniques in stimulating sensory systems • Techniques in extra- and intracellular recording of neuronal activity during respiration and vocalization • Computer based analysis of behavioral and physiological data 					
4	Teaching/Learning methods					
	<ul style="list-style-type: none"> • Lectures; Practical/Lab (Project work); Seminar; Guidance to independent research; Training on presentation techniques in oral and written form 					
5	Requirements for participation					
	Enrollment in the Master´s degree course "Biological Sciences" or in the Master´s degree course "Klinische und Experimentelle Neurowissenschaften"					
	Additionally recommended: A strong interest and basic knowledge in neurobiology is required. Participation in module MN-B-SM (N 2) (1 st half of the summer term) is advantageous.					

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6	<p>Type of module examinations</p> <p>The final examination consists of three parts: 30 min oral 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>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>Elective module in the Master's degree course "Klinische und Experimentelle Neurowissenschaften"</p>
9	<p>Significance of the module mark for the overall grade</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>Module coordinator</p> <p>Prof. Dr. Wolfgang Walkowiak, phone 470-3119, e-mail: w.walkowiak@uni-koeln.de</p>
11	<p>Additional information</p> <p>Subject module of the Master's degree course "Biological Sciences", Focus of research: (N) Neurobiology</p> <p>Participating faculty: Dr. A. von Twickel, Prof. Dr. W. Walkowiak</p> <p>Literature:</p> <ul style="list-style-type: none"> • Kandel, E.R., Schwartz, J.H., Jessell, T. (2000) Principles of Neural Science. 4th edition, McGraw-Hill. Chapters 1, 19, 29, 32 • Purves, D., Augustine, G.J., Fitzpatrick, D., Hall, C.W. <i>et al.</i> (2007) Neuroscience. 4th edition, Palgrave Macmillan. Chapters 12, 13, 27 • Further original publications will be handed out during the first week of the module <p>General time schedule: Week 1 (Mon.-Fri.): Lectures and preparation for the seminar talk (held at the end of week 1); Week 2-5 (Mon.-Fri.): Lectures and practical/lab; Week 6 (Mon.-Fri): Data evaluation and writing seminar paper; Week 7 (Mon.-Fri): Preparation for the oral examination</p> <p>Note: The module contains hand-on laboratory work conducted by small groups of students 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: June 12, 2017 at 9:00 a.m., Cologne Biocenter, room 1.007 (first floor)</p> <p>Oral examination: July 28, 2017; more details will be given at the beginning of the module</p>

* 4 students from the Master's degree course "Biological Sciences" and 4 students from the Master's degree course "Klinische und Experimentelle Neurowissenschaften".