

Module Name Neural Function I: Neural Basis of Motor Behavior in Animals						
Type of Module ○ Advanced Module				Module Code Neural Function I		
Identification Number MN-B-SM (N 1)	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 20 h 100 h 10 h	Private Study 40 h 160 h 30 h	Planned Group Size* max. 12 max. 2 max. 12	
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 how the nervous system generates locomotion in vertebrates and invertebrates • have acquired an understanding about the role of brain signals for initiation and maintenance of locomotion, the role of intersegmental signals exchanged between neural networks within the ventral nerve cord and spinal cord to coordinate locomotor activity and the role of sensory signals in shaping the motor activity in a task-specific fashion. • are able to apply electromyographic, extracellular and intracellular recording techniques used in neurobiology and are able to independently design and perform small scientific projects related to topics of the module. • have acquired basic programming skills with the high level programming language Matlab. • are able to analyze electrophysiological data using Matlab and the Spike 2 software package. • 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"> • Basic properties of neuronal and excitable membranes • Intra- and extracellular recordings of motor activity in invertebrates and vertebrates • Identification of building blocks of neural circuits generating rhythmic or patterned motor output for behavior • Pharmacological induction of neural network activity • Staining techniques and fluorescence microscopy • Analysis of electrophysiological data with Matlab 					
4	Teaching Methods Lectures; Practical/Lab (Project work); Seminar; Computer exercises with Matlab; Guidance to independent research; Training on presentation techniques in oral and written form					

5	<p>Prerequisites (for the Module)</p> <p>Enrollment in the Master’s degree course “Biological Sciences” or in the Master’s degree course “Klinische und Experimentelle Neurowissenschaften”</p> <p>Additional academic requirements</p> <p>Previous attendance of the lecture module “Neurobiology: Genes, Circuits, and Behavior (N)”. The knowledge of neurobiology on the level of a general biology text book (Campbell or Purves) is absolutely required.</p>
6	<p>Type of Examination</p> <p>The final examination consists of two parts: oral presentation (20-30 min; 50 % of the total module mark), written report (50 % of the total module mark)</p>
7	<p>Credits Awarded</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 “Clinical and Experimental Neurosciences”</p>
9	<p>Proportion of Final Grade</p> <p>15 % of the overall grade (see also appendix of the examination regulations)</p>
10	<p>Module Coordinator</p> <p>Prof. Dr. Ansgar Büschges, phone 470-2607, e-mail: ansgar.bueschges@uni-koeln.de</p>
11	<p>Further Information</p> <p>Subject module of the Master’s degree course “Biological Sciences”, Specialization: (N) Neurobiology: Genes, Circuits, and Behavior</p> <p>Participating faculty: Prof. Dr. A. Büschges, Dr. T. Bockemühl, Dr. M. Gruhn, Dr. C. Manziaris, PD Dr. J. Schmidt</p> <p>Literature:</p> <ul style="list-style-type: none"> Information about textbooks and other reading material will be given during the course <p>General time schedule: Week 1-6 (Mon.-Fri.): Lectures, practical/lab and preparation for the seminar talk (held at the end of week 6); Week 7 (Mon.-Fri): Preparation for the oral examination and the written report. The written report shall be handed in 3 weeks after the end of the module.</p> <p>Note: The module contains hands-on laboratory work conducted individually and is taught in course rooms. The module contains computer-based practicals as a complementary component.</p> <p>The teaching language of the course is English.</p> <p>Introduction to the module: April 04, 2022 at 9:00 a.m., Cologne Biocenter, room 1.007 (first floor); for preparation to the module before this introduction see advice(s) under literature</p> <p>Oral examination: May 20th, 2022, second/supplementary examination July 21st, 2022; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.</p>

* 8 students from the Master’s degree course “Biological Sciences” and 4 students from the Master’s degree course “Klinische und Experimentelle Neurowissenschaften”.