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| **Module Title: Neural Function II: Neurons, Networks and Behavior** | | | | | | | | |
| **Identification-Nr.**  M-MN-N-Neuro  M02 | | **Workload**  360h | | **Credit Points**  12CP | **Frequency of Occurence**  Summer term, 2nd half | | | **Duration**  7 weeks |
| 1 | **Type of lessons**   1. Lectures 2. Practical/Lab 3. Seminar | | **Contact times**   1. 20h 2. 100h 3. 10h | | | **Self-study times**   1. 40h 2. 160h 3. 30h | **Intended group size\***   1. max. 12 2. max. 2 3. max. 12 | |
| 2 | **Aims of the module and acquired skills**  Students who successfully completed this module ...   * have acquired detailed knowledge about concepts and experimental approaches in the   analysis of neuronal networks.   * are trained in preparations and intracellular and/or extracellular recording techniques to study the neural network functions, and rhythmic motor behavior in different model systems from invertebrates to vertebrates (see content of the module). * are able to independently design and perform small scientific projects related to   topics of the module.   * Have applied data analysis using the high-level programming language Matlab and/or the Spike2 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 the skills acquired in this module to other fields of biology. | | | | | | | |
| 3 | **Contents of the module**   * Analysis of rhythmic motor behavior in lamprey, crustaceans (stomatogastric nervous system and swimmeret system) * Electrophysiological and pharmacological analysis of neural networks * Functional properties of neural networks and generation of rhythmic activity * Different extracellular and intracellular recording techniques of neural activity * Techniques in recording motor behavior in insects * Staining techniques for neurons and microscopy * Data analysis with Matlab | | | | | | | |
| 4 | **Teaching/Learning methods**   * Lectures; Practical/Lab (Project work); Seminar; Computer modeling; 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”  Participation in the module Neural Function I: From Experiments to Analysis. In cases of doubt, please contact PD Dr. Joachim Schmidt (joachim.schmidt@uni-koeln.de) | | | | | | | |
| 6 | **Type of module examinations**  The final examination consists of two parts: 30 min oral examination about topics of the lectures and the practical/lab part (70 % of the total module mark) and oral presentation (30 % of the total module mark) | | | | | | | |
| 7 | **Requisites for the allocation of credits**  Regular and active participation; Passed seminar paper;  Each examination part at least “sufficient” (see appendix of the examination regulations for details) | | | | | | | |
| 8 | **Compatibility with other Curricula\***  Elective module in the Master´s degree course “Klinische und Experimentelle Neurowissenschaften” | | | | | | | |
| 9 | **Significance of the module mark for the overall grade**  In the Master´s degree course “Experimental and Clinical Neuroscience”: 12 % of the overall grade (see also appendix of the examination regulations) | | | | | | | |
| 10 | **Module coordinator:** Prof. Dr. Ansgar Büschges, phone 470-2607, [ansgar.bueschges@uni-koeln.de](mailto:ansgar.bueschges@uni-koeln.de)  **Participating faculty:** Prof. Dr. A. Büschges, Dr. T. Bockemühl, Dr. M. Gruhn, Dr. C. Guschlbauer, Prof. Dr. M. Nawrot, PD Dr. J. Schmidt, Dr. C. Wellmann | | | | | | | |
| 11 | **Additional information**  **Subject module** of the Master´s degree course “Biological Sciences”,  **Focus of research:** (N) Neurobiology  **Literature:**   * Literature will be delivered in the course   **General time schedule:** Week 1-6 (Mon.-Fri.): Lectures, practical/lab, analysis of self-acquired data with Matlab, and preparation of oral project presentation (held at the end of week 6) as well as writing seminar paper; Week 7 (Mon.-Fri): Preparation for the oral examination  **Note:** The module contains hands-on laboratory work conducted individually and is taught in research laboratories. The module does not contain computer-based practicals/research as a main component.  **Introduction to the module:** June 12, 2017 at 9:00 a.m., Cologne Biocenter, room 1.007 (first floor) **Oral examination:** July 28, 2017; more details will be given at the beginning of the module | | | | | | | |

**\*** Gemäß Studienverlaufsplan (s. Anlage 1 der Prüfungsordnung)

**\*** 7 students from the Master’s degree course “Biological Sciences” and 5 students from the Master’s degree course “Klinische und Experimentelle Neurowissenschaften”