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| **Module Title: Neural Basis of Complex Behavior** | | | | | | | | |
| **Identification-Nr.**  M-MN-N-Neuro  M04 | | **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. 10 h 2. 164 h 3. 10 h | | | **Self-study times**   1. 20 h 2. 132 h 3. 24 h | **Intended group size\***   1. max. 8 2. max. 4 3. max. 2 | |
| 2 | **Aims of the module and aquired skills**  Students who succesfully completed this module ...   * 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**   * 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.e. 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**   * 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) (1st half of the summer term) is advantageous. | | | | | | | |
| 6 | **Type of module examinations**  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) | | | | | | | |
| 7 | **Requisites for the allocation of credits**  Regular and active participation;  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. Wolfgang Walkowiak, phone 470-3119, [w.walkowiak@uni-koeln.de](mailto:w.walkowiak@uni-koeln.de) **Participating faculty:** Dr. A. von Twickel, Prof. Dr. W. Walkowiak | | | | | | | |
| 11 | **Additional information**  **Subject module** of the Master´s degree course “Biological Sciences”,  **Focus of research:** (N) Neurobiology  **Literature:**   * Kandel, E.R., Schwartz, J.H., Jessell, T. (2000) Principles of Neural Science. 4th edition, NcGraw-Hill. Chapters 1, 19, 29, 32 * Purves, D., Augustine, G.J., Fitzpatrick, D., Hall. C.W. et al. (2007) Neuroscience. 4th edition, Palgrave Macmillan. Chapters 12, 13, 27 * Further original publications will be handed out during the first week of the module   **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  **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.  **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)