

Sensory Perception, Synaptic Transmission, Receptor Repertoires and Evolution					
Identification number	Workload	Credit points	Term of studying	Frequency of occurrence	Duration
MN-B-SM (N 5)	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		20 h	30 h	max. 4
	b) Practical/Lab		156 h	120 h	max. 4
	c) Seminar		10 h	24 h	max. 4
2	Aims of the module and acquired skills Students who successfully completed this module ... <ul style="list-style-type: none"> • have acquired in depth knowledge on identification, isolation, and functional analysis of transmitter, sensory receptors and ligand-gated ion channels and their function within neuronal cells as well as on the evolution of receptor structure and function. • have working skills necessary to tackle the analysis of membrane receptors (see contents of the module) and are able to independently design and perform small scientific projects related to topics of the module. • have obtained an understanding of the advantages and disadvantages of different model systems (mammalian cell culture, larval fish). • 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"> • Transfection of neurotransmitter receptors in HEK cells, quantification • Isolation of membrane proteins and Western Blot • Dose-response curves and signal transduction of insect octopamine receptors • Data mining of receptor gene families in teleost genomes (blast, HMM) • Phylogenetic trees and sequence alignments (NJ, ML, MAFFT, sequence logo) • Generating a probe for in situ hybridisation (PCR, colony PCR, miniprep, electrophoresis) • Whole mount <i>in situ</i> hybridisation of larval zebrafish • Microinjection of zebrafish oocytes for analysis of transgenes • Fluorescence microscopy 				
4	Teaching/Learning methods <ul style="list-style-type: none"> • Lectures; Practical/Lab (Project work); Seminar; Computer exercises; Guidance to independent research; Training on presentation techniques in oral and written form 				

5	<p>Requirements for participation</p> <p>Enrollment in the Master´s degree course "Biological Sciences"</p> <p>Additionally recommended: A strong interest and basic knowledge in neurobiology is required. Participation in module <i>Neural Function I: From Experiments to Analysis</i> (1st half of the summer term) is advantageous.</p>
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>None</p>
9	<p>Significance of the module mark for the overall grade</p> <p>15 % of the overall grade (see also appendix of the examination regulations)</p>
10	<p>Module coordinator</p> <p>Prof. Dr. Sigrun Korsching, phone 470-4843, e-mail: sigrun.korsching@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: Genes, Circuits, and Behavior Participating faculty: Prof. Dr. A. Baumann, Prof. Dr. S. Korsching</p> <p>Literature:</p> <ul style="list-style-type: none"> • Information about textbooks and other reading material will be given on the ILIAS representation of the course (https://www.ilias.uni-koeln.de/ilias/goto_uk_cat_2815610.html) <p>General time schedule: Week 1-6 (Mon.-Fri.): Lectures, practical/lab, data evaluation, preparation and presentation of seminar talk as well as writing and presenting results report; 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 07, 2021 at 9:00 a.m., Cologne Biocenter, room 1.007 (first floor) or online (in this case, further information/link will be sent to your Smail-Account); for preparation to the module before this introduction see ILIAS link under literature.</p> <p>Oral examination: July 23, 2021, second/supplementary examination August 27, 2021; the latter date may vary if students and module coordinator agree. More details will be given at the beginning of the module.</p>

Corona note! Depending on the Corona situation during the summer term, practical work may be skipped either totally or in part. In this case, some or all practical parts will be replaced by adequate alternatives so that (i) the workload and (ii) the principle content of the modules remain unchanged.