

Course title: Animal Models in Neuroscientific Research				
Identification number	Workload	Credits	Frequency of occurrence	Duration
M-Neuro-AM15	270h	12	WS-SS	Two semesters (Can only be started in the winter semester)
1	Type of lessons a) lecture b) practice	Contact times a) 30h b) 24h	Self-study times 200h (Preparation and post-processing of lectures, practical and exam)	Intended group size a) ca. 8 students b) ca. 8 students per supervisor c) min 6 – max 10
2	Aims of the module and acquired skills Framework of animal model validity criteria <ul style="list-style-type: none"> The topic of this course is related to modeling neuropsychiatric disorders in neuroscience. Students have to learn how models are built, tools such as behavioral testing is done in experimental setup and how to evaluate the translational validity of the dataset generated. Students need to acquire knowledge, related to the various limitations of unimodal testing of behavior in experimental animals. Also, the limitations of animal models will be discussed. Extra- + intracellular derivation techniques in vivo + in vitro Phenotyping of rat model for Tourette syndrome: motor tic scoring <ul style="list-style-type: none"> Using selected examples, the students will learn how the real analysis of a rat model for TS would be compared between various treatments. 			
3	Contents of the module The module consists of a theoretical part in the winter semester and a practical part in the following summer semester. Both are required for the completion of the module. <ul style="list-style-type: none"> Framework for validity criteria of animal model of neuropsychiatric disorders Motor Disorders, Dementia, Anxiety, Depression, etc. Locomotor activity scoring Learning and memory tests Phenotyping of rat model for TS: using professional digital method Basic biostatistics Scientific writing: reporting and grading in form of a mini-review and short communication style 			
4	Teaching/Learning Methods Seminar format; instruction for independent practical work, presentation			
5	Requirements for participation Enrollment in the Master's degree course "Experimental and Clinical Neurosciences" at the University of Cologne Content: Basic knowledge in biology, neuroanatomy and neurophysiology is desirable. It is important that students have a fundamental understanding of biostatistics prior to participation.			
6	Type of module examination Preliminary Examinations: Regular participation and active cooperation, sufficient preparation for the topics Final examination: Scientific report (Mini-review for the theory section, and Short Communication for the practical section)			
7	Requirement for the allocation of credits Successful practice evaluation and paper			
8	Compatibility with other Curricula none			

9	<p>Significance of the module mark for the overall grade</p> <p>In the Master’s degree course “Experimental and Clinical Neurosciences”: 12% of the overall grade (see also appendix of the examination regulations)</p>
10	<p>Module coordinator</p> <p>Teaching coordinator: Dr. Thibaut Sesia, thibaut.sesia@uk-koeln.de</p> <p>Teachers: Dr. Thibaut Sesia</p>
11	<p>Additional information</p> <p>Literature:</p> <ul style="list-style-type: none"> • Belzung C, Lemoine M (2011) Criteria of validity for animal models of psychiatric disorders: focus on anxiety disorders and depression. <i>Biol Mood Anxiety Disord</i> 1, 9. • Kanwisher N (2025) Animal models of the human brain: Successes, limitations, and alternatives. <i>Curr Opin Neurobiol</i> 90, 102969. • Witt KM, Harper DN, Ellenbroek BA (2025) A review on the validity of animal models for neuropsychiatric disorders: an exploration of anhedonia. <i>Behav Pharmacol</i> 36, 165–170. • Dobolyi A (2025) Integrating the COM-B model into behavioral neuroscience: A framework for understanding animal behavior. <i>Prog Neuro-Psychopharmacol Biol Psychiatry</i> 138, 111346.

