

Module title		Abbreviation
Ion channels		03-TN-IC-152-m01
Module coordinator		Module offered by
Institute of Clinical Neurobiology		Faculty of Medicine
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	graduate	--
Contents		
<p>Students will get a theoretical introduction and amplification of topics in ion channel physiology. The following topics will be discussed: physiological properties of membranes, structure-function relationships of ligand-gated and voltage-gated ion channels and their subfamilies, regulation and pharmacology of ion channels, anatomical expression profiles, developmental regulation, evolution of ion channels, sensory systems, ion channelopathies. The accompanied literature seminars are based on current publications of ion channel structures and physiological aspects to discuss experimental and methodological approaches and with this promoting translational thinking. Using student presentations of current research results, the earned knowledge on ion channels is recessed. The practical session will include whole cell recordings at the electrophysiological setup using transfected cells and primary neurons. Using various neurotransmitters and blocking agents, students will apply their learned knowledge of ion channel physiology and observe the consequences at the functional level.</p>		
Intended learning outcomes		
<p>Students who successfully completed this module are able to remind and understand the physiological properties of various ion channel families and their importance for brain physiology. The students are able to classify in a bottom-up approach to put the molecular findings into the context of pathomechanisms in various kinds of channelopathies. They will be trained in recording techniques to study ion channel properties on transfected/injected cell lines as well as primary neurons. With this experience, students are able to evaluate the applicability of electrophysiological recording techniques for various ion channels. Additionally, they are able to critically read, reflect, and present scientific reports in the field of channel physiology.</p>		
Courses (type, number of weekly contact hours, language – if other than German)		
V (0) + S (0) + P (2)		
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)		
a) written examination (30 to 60 minutes, including multiple choice questions) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Master's degree (1 major) Translational Neuroscience (2015)		
Master's degree (1 major) Translational Neuroscience (2017)		

Master's degree (1 major) Translational Neuroscience (2018)
Supplementary course Translational Neuroscience (2018)
Master's degree (1 major) Translational Neuroscience (2022)
Supplementary course Translational Neuroscience (2022)