

<b>Module Title: Sleep and clinical neuroscience</b>				
<b>Identification number</b>	<b>Workload</b>	<b>Credit points</b>	<b>Frequency of occurrence</b>	<b>Duration</b>
M-Neuro-AM11 a-e	180h	6	WS	One Semester
<b>1</b>	<b>Type of lessons</b> a) Lectures b) Practical c) Seminars	<b>Contact times</b> a) 12 b) 40 c) 6	<b>Self-study times</b> 122 (Preparation of seminar and post-processing of lectures)	<b>Intended group size</b> 12
<b>2</b>	<b>Aims of the module and acquired skills</b> <ul style="list-style-type: none"> <li>In the lectures, the students will get an overview of the neurobiology of sleep, how to assess sleep/wake patterns, the pathophysiology of common sleep disorders, and the interplay between sleep disturbance and neuropsychiatric disorders. Moreover, various treatment approaches for sleep disorders will be discussed.</li> <li>In the seminars, each student should present a pre-defined scientific sleep paper on a hot topic in sleep medicine and will present its strengths and limitations.</li> <li>In the practical week, polysomnography and subjective sleep assessment will be introduced on the first day, then students will visit MRI and PET sites in Jülich and then they are assigned to a small pre-defined research project using various neuroimaging techniques (e.g., coordinate-based meta-analysis, Voxel-based morphometry, resting-state fMRI) in a sleep-related dataset as different teams (two people per team) during the next days, in the last day they present the results of their practical project.</li> </ul>			
<b>3</b>	<b>Contents of the module</b> <p><b>- Lectures (6 days, 12 sessions, 45 min per session)</b></p> <ol style="list-style-type: none"> <li>Neuroanatomy of sleep</li> <li>Neurochemistry of sleep</li> <li>Subjective and objective sleep assessment tools</li> <li>Circadian rhythm</li> <li>Sleep deprivation</li> <li>Sleeping brain and dreaming</li> <li>Sleep disorders I (insomnia and narcolepsy)</li> <li>Sleep disorders II (sleep apnea, PLM, night terror, etc.)</li> <li>Sleep and neurodegeneration</li> <li>Sleep and psychiatric disorders</li> <li>Pharmacological treatments for sleep disorders</li> <li>Non-pharmacological treatments for sleep disorders</li> </ol> <p><b>- Seminar</b> at the end of each lecture session</p> <p><b>- Practical/Lab (5 days in INM7/INM2, Jülich Research Center)</b> Performance tests, Wake EEG, Sleep EEG, Actigraphy, Sleep questionnaires, Neuroimaging meta-analysis in sleep disorders, Brain-behavioural association in sleep studies</p>			
<b>4</b>	<b>Teaching/Learning Methods</b> Lectures, practical week, and seminar presentation by students			
<b>5</b>	<b>Requirements for participation</b> Enrollment in the Master's degree course "Experimental and Clinical Neurosciences" at the University of Cologne Basic knowledge in neuroanatomy and neurophysiology, statistics, neuroimaging and computational neuroscience are helpful.			
<b>6</b>	<b>Type of module examination</b> Critical presentation of scientific papers in seminar section			

7	<b>Requirement for the allocation of credits</b> Regular participation in lectures and practical course, successful presentation in seminar
8	<b>Compatibility with other Curricula</b> none
9	<b>Significance of the module mark for the overall grade</b> In the Master's degree course "Experimental and Clinical Neurosciences": 6 % of the overall grade
10	<b>Module coordinator</b> Prof. David Elmenhorst, E-Mail: d.elmenhorst@fz-juelich.de Dr. Masoud Tahmasian, E-Mail: m.tahmasian@fz-juelich.de
11	<b>Additional information Literature:</b> Relevant Peer-Review Literature, which will be announced in class