



Full Syllabus



Course Title	
Molecular basis and histopathology of central nervous system diseases and its animal models	
Lecturer	
Prof. Jens Pahnke University of Oslo, Norway	
Semester	
Second	
Course requirements	
Introduction to Neurobiology or equivalent courses	
Final grade components	
Exam	
Course schedule	
Class no. / Date	Subject and Requirements (assignments, reading materials, tasks, etc.)
1	Introduction – tissue reaction, injury patterns, staining methods, analytic methods, mouse models of brain diseases
2	Oedema, herniation, hydrocephalus
3	Brain trauma – parenchymal, vascular, haematomas
4	Cerebrovascular disease – hypoxia, ischemia, haemorrhage
5	Congenital malformations / brain development
6	Infections of the nervous system
7	Brain tumours – benign and malignant tumours in kids and adults
8	Molecular methods in brain tumour diagnostics
9	Diseases involving the skeletal muscle
10	Inflammatory / demyelinating diseases
11	Neurodegenerative diseases



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12	1. Image processing and the use of machine learning for the analysis of brain tissue

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Required course reading

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Optional course reading

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Comments

The course will describe methodological approaches used in neuropathologic investigations and diagnostics of a variety of brain diseases. It will cover basic neuropathology from tissue reactions in the brain, stroke, trauma, vascular problems and clinical neuropathology from neurodegenerative diseases, such as Alzheimer's disease and other dementias, metabolic diseases, inflammatory diseases, such as Multiple sclerosis, infectious diseases, such as Creutzfeldt-Jakob disease and viral infections, malformations of the nervous system to brain tumour pathology. It will cover the molecular mechanisms underlying these diseases and present the models of these diseases in research.

The course will describe the background of nervous system diseases and introduce microscopic methods to determine nervous system changes in human brain and mouse models. It will furthermore present strategies for treatment development and translational research as well as pharmacological strategies. The course will also introduce machine learning-assisted (AI – artificial intelligence) analyses of brain slices using specific tissue stains (immunohistochemistry, immunofluorescence, specific dyes) and H&E.