Lecture: Structure, Plasticity and Repair of the Nervous System

(UZH: BIO343 / ETH: 376-1305-01 V)

General Information

Semester: HS2017

Time: Mondays, 10:15 - 12:00

Location: Lecture hall Y15 G40 (Irchel Campus)

Responsible Lecturer: Prof. Gerhard Schratt, Lecture Coordinator: Dr. Cecilia Nicoletti

Schedule

Functional anatomy of the NS I	GS	18.09.2017
Functional anatomy of the NS II	GS	25.09.2017
Learning and memory	RF	02.10.2017
Sensory systems I	WB	09.10.2017
Sensory systems II	WB	16.10.2017
Sensory systems III	WB	23.10.2017
Motor systems I	MH	30.10.2017
Motor systems II	MB	06.11.2017
Diseases of the NS (introduction and examples)	LF	13.11.2017
Neurodegenerative diseases (Parkinson's disease)	LF	20.11.2017
Multiple sclerosis and autoimmunity	LF	27.11.2017
Neural stem cells I & II	SJ	04.12.2017
Higher Brain Functions	JB	11.12.2017
Cognition, Attention & Stress	JB	18.12.2017

GS Gerhard Schratt, RF Roberto Fiore, WB Wolfger von der Behrens, MB Marc Bolliger, MH Michèle Hubli, LF Linard Filli, SJ Sebastian Jessberger, JB Johannes Bohacek

Content of lectures and recommended literature

Date	Title	Tutor	Content	Additional Literature *	
18.09.2017	Functional anatomy of the NS I	GS	CNS, PNS, autonomic NS, Subdivision of the CNS Somato-sensory system, Pain Vision: central pathways Hearing and Balance Smell, olfaction Taste	Purves (4th Ed) Ch. 1: pp 16-22 Ch. 21 Ch. 9: pp 218-228 Ch. 10 Ch. 12: pp 289-310 Ch. 13: pp 332-342 Ch. 14: pp360-362 Ch. 15: pp 363-369 Ch. 15: pp 381-387	Purves (5th Ed) Ch. 1: pp 15-21 Ch. 21 Ch. 9: pp 198-207 Ch.10 Ch. 12: pp 257-275 Ch. 13: pp 293-301 Ch. 14: pp 318-319 Ch. 15: pp 321-329 Ch. 15: pp340-345
25.09.2017	Functional anatomy of the NS II	GS	Motor system: motor Cortex, brainstem, spinal cord: command and execution Cerebellum: coordination of movement Basal ganglia: movement initiation and control Limbic system (emotions, memory), Modulatory Systems, sleep/ arousal	Purves (4th Ed) Ch. 16: pp 397-399 Ch. 17: pp 425-437 Ch. 19: pp 475-486 Ch. 18: pp 453-459 Ch. 29: pp 739-743 Ch. 28: pp 720-725	Purves (5th Ed) Ch. 16: pp353-354 Ch. 17: pp 389-397 Ch. 19: pp 417-426 Ch. 18: pp 399-404 Ch. 29: pp 652-653 Ch. 28: pp 639-641
02.10.2017	Learning and memory	RF	What happens in the brain when we learn new information or new skills? How do we learn? What are the cellular and molecular events underlying learning and memory.	Purves (4th Ed) Ch. 8, 24, 26, 31	Purves (5th Ed) Ch. 8, 23, 24, 26, 31
09.10.2017	Sensory systems I	WB	The auditory system - Sound and ear anatomy - The cochlea - Localization - Central processing - Prosthesis	Purves(4th Ed) Ch. 13	Purves (5th Ed) Ch. 13
16.10.2017	Sensory systems II	WB	The vestibular system - The labyrinth - Hair cells - Central pathways - Comparison auditory and vestibular system	Purves (4th Ed) Ch. 14	Purves (5th Ed) Ch.14

23.10.2017	Sensory systems III	WB	Odorant receptors Olfactory transduction The olfactory bulb Pheromones	Purves (4th ED), Ch. 15	Purves (5th ED), Ch. 15
30.10.2017	Motor systems I	MH	Upper motor neuron control, damage to upper motor neurons Lower motor neuron circuits and motor control: motor unit and neuro-muscular transmission, reflexes, central pattern generators	Purves (4th Ed) Ch. 17 Purves (4th Ed) Ch. 16 Appendix: pp 816-821 Original papers, will be available on OLAT / Moodle	Purves (5th Ed) Ch. 17 Purves (5th Ed) Ch. 16 Appendix: pp718-722 Original papers, will be available on OLAT / Moodle
06.11.2017	Motor systems II	MB	Human spinal cord injury Assessment of human SCI Robotic neurorehabilitation	Original papers, will be available on OLAT / Moodle	Original papers, will be available on OLAT / Moodle
13.11.2017	Diseases of the NS (introduction and examples)	LF	Classification of NS diseases Animal models for NS diseases Stroke and Neurorehabilitation	Purves (4th Ed) parts of Chapters 17, 19, 25, 27, Appendix (p. 833-842)	Purves (5thEd) parts of Chapters 17, 19, 25, 27, Appendix (p. 735-744)
20.11.2017	Neurodegenerative diseases (Parkinson's disease)	LF	Overview on Neurodegenerative Diseases Parkinson Disease: concepts, (putative) causes, animal models and current research and therapies	Purves (4th Ed) Ch18, parts of chapter 31 (AD: Box 31D, p.811)	Purves (5thEd) Ch18, parts of chapter 31 (AD: Box 31D, p.713)
27.11.2017	Multiple sclerosis and autoimmunity	LF	Current concepts of MS; cause, treatment and clinical manifestation Experimental allergic encephalomyelitis (EAE) models for MS, research on EAE model	Purves (4th Ed) Ch 3 (pp. 56-60), Ch6, Box 6B (p. 127)	Purves (5thEd) Ch 3 (pp. 51-55), Ch6, Box 6B (p. 117)
04.12.2017	Neural stem cells I & II	SJ	Overview of the cellular and molecular mechanisms that govern the neurogenic process within the adult mammalian brain. Significance of life-long neurogenesis for adult brain function, how diseases affect neurogenesis and how neural stem cells may be used for brain repair	Purves (4th Ed) Ch25, Original papers will be available on OLAT	Purves (5th Ed) Ch25, Original papers will be available on OLAT
11.12.2017	Higher Brain Functions	JB	Overview of association cortex and related brain functions including attention, recognition, planning and decision making. Discussion of famous clinical case studies related to loss of these functions. Focus on attention and ADHD.		Purves (5th Ed) Chapter 26
18.12.2017	Cognition, Attention & Stress	JB	Overview of brain circuits related to fear and anxiety. Overview of the stress axis. Discussion about how stressful experiences shape brain function and behavior.		Purves (5th Ed) Chapter 29

*Text book: Dale Purves, George J. Augustine, David Fitzpatrick, Neuroscience, 5th Edition (or also 4th Edition), Sinauer Associates Inc.

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