

SEMESTER II
LSM3216 NEURONAL DEVELOPMENT AND DISEASES

Prerequisite: LSM2232 and LSM2233

Preclusion: LSM3213 Molecular and Cellular Neurobiology

Workload: 24 lecture hours + 8 tutorial hours + 2 hours CA

Course description:

This module will focus on key events that take place in different stages of vertebrate nervous system development including neural induction, neurogenesis, glial biology, neuronal growth and polarity, axonal guidance, synapse formation, and regeneration. Pathological states such as muscular dystrophy, spinal cord injury, Parkinson's disease, and other neurodegenerative diseases will be studied, both in terms of understanding the deficits as well as examining potential solutions to improve the outcomes of these neuronal diseases. Latest findings will be discussed, allowing students to learn the current state of research in developmental neurobiology.

S/N	Topics	Lecture hours
1.	Overview of Developmental Neurobiology	2 Dr John Chua
2.	Neuronal polarity & protein trafficking	2 Dr John Chua
3.	Neural induction pattern formation and neurogenesis	2 A/P Tang Bor Luen
4.	Neuronal migration and axonal pathfinding	2 A/P Tang Bor Luen
5.	Neuronal death and neurodegeneration	2 A/P Tang Bor Luen
6.	Rodent models for neuroscience research	2 Dr Wong Peiyan
7.	Neuronal regeneration & neural stem cells	2 A/P Tang Bor Luen
8.	Glia biology – Part I	2 A/P Too Heng Phon
9.	Glia biology – Part II	2 A/P Too Heng Phon
10.	Neurotrophic factors – Part I	2 A/P Too Heng Phon
11.	Neurotrophic factors – Part II	2 A/P Too Heng Phon
12.	Selected topics	2 Guest Lecturer - TBA
13.	Self-directed learning	4
		Total Lectures: 24h Self-directed learning: 4 h Practicals: 0h Tutorials: 8h
	Total hours:	36 h

Compulsory Reading:

1. Neuroscience: Explore the Brain – Mark F. Bear, Barry W. Connors and Michael A Paradiso
2. The Neuron: Cell and Molecular Biology – Irwin B. Levitan and Loenard K. Kaczmarek

Supplementary Reading: 1. Fundamental Neuroscience – Larry R. Squire, Darwin Berg, Floyd E. Bloom, Sascha du Lac, Anirvan Ghosh and Nicholas C. Spitzer

MODE OF ASSESSMENT: 30% Tests and 70% Final Exam

MODULE CO-ORDINATOR:

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