

Course Syllabus
MBNS 605 Neurochemistry
Academic Year 2021

Course ID and Name: MBNS 605 Neurochemistry

Course coordinator: Prof. Banthit Chetsawang, Ph.D.

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Instructors:

1. Prof. Piyarat Govitrapong, Ph.D. (piyarat.gov@mahidol.ac.th)
2. Prof. Banthit Chetsawang, Ph.D. (banthit.che@mahidol.ac.th)
3. Assoc. Prof. Wipawan Thangnipon, Ph.D. (wipawan.tha@mahidol.ac.th)
4. Assoc. Prof. Nuanchan Chutabhakdikul, Ph.D. (nuanchan.chu@mahidol.ac.th)
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8. Lect. Jiraporn Panmanee, Ph.D. (jiraporn.pam@mahidol.ac.th)

Supporting Staff:

1. Somsong Phengsukdaeng (somsong.phe@mahidol.edu)

Credits: 2 (2-0-4)

Curriculum: Master of Science Program in Neuroscience (core course)

Doctor of Philosophy Program in Neuroscience (core course for B.Sc. Graduates and M.Sc. Graduates in other fields)

Semester offering: First semester

Pre-requisites: -

Course learning outcomes (CLOs)

Upon completion of this course, students should be able to:

1. Understand chemical neurotransmitters, presynaptic proteins and cell adhesion molecules, chemically mediated synaptic transmission, neurotransmitter receptors, receptor-activated phosphoinositide turnover, G-proteins, cyclic nucleotides, and phosphorylation in regulation of neuronal signaling functions. (PLO2) I
2. Explain the principles and concepts of the chemical and functional organization of the nervous system at the cellular and molecular levels. (PLO2) I
3. Demonstrate an understanding of essential knowledge acquired for further approaches relevant to neurochemical research. (PLO3) R

Alignment of teaching and assessment methods to course learning outcome:

Course learning outcome	Teaching method	Assessment method
1. Understand chemical neurotransmitters, presynaptic proteins and cell adhesion molecules, chemically mediated synaptic transmission, neurotransmitter receptors, receptor-activated phosphoinositide turnover, G-proteins, cyclic nucleotides, and phosphorylation in regulation of neuronal signaling functions.	(1) Lecture	(1) Quiz (2) Written examination
2. Explain the principles and concepts of the chemical and functional organization of the nervous system at the cellular and molecular levels.	(1) Lecture	(1) Quiz (2) Written examination
3. Demonstrate an understanding of essential knowledge acquired for further approaches relevant to neurochemical research	(1) Group discussion	(1) Participation

Course description:

The course emphasizes on principles of chemical transmission; second messenger; signaling transduction; neurotransmitters; neurotransmitter receptors; nuclear hormone receptor signaling; advances in neuronal stem cell research and molecular biology.

Course schedule:

Date: Monday, Wednesday and Friday

Time: 09.00 – 11.00 and 13.00 – 15.00

Rooms: Class activity will be held by an onsite at MB Building or online platform through videoconferencing application, either through WebEx or Zoom depending on the situation of the COVID-19 pandemic in Thailand.

Topics	Date	Time	Topics	Instructors
1.	13 Sep 2021	09.00-11.00	Chemical neurotransmission and signal transduction	Wipawan
2.		13.00-15.00	Synaptic, presynaptic proteins and cell adhesion molecule	Nuanchan
3.	15 Sep 2021	09.00-11.00	Acetylcholine	Nuanchan
4.		13.00-15.00	Catecholamine	Piyarat
5.	17 Sep 2021	09.00-11.00	Serotonin, histamine and melatonin	Banthit
6.		13.00-15.00	Amino acid neurotransmitters	Banthit
7.	20 Sep 2021	09.00-11.00	Neuropeptide	Piyarat
8		13.00-15.00	Atypical neurotransmitters	Sujira
Exam I	27 Sep 2021	09.00-16.00	Exam 1 (Topics 1-8)	Somsong
9.	29 Sep 2021	09.00-11.00	Neurochemistry of learning and memory	Wipawan
10.		13.00-15.00	Nuclear hormone receptor signaling	Nuanchan
11.	1 Oct 2021	09.00-11.00	Neural stem cells	Wipawan
12.		13.00-15.00	Recombinant DNA and protein technology	Jiraporn
13.	4 Oct 2021	09.00-11.00	Up-and down-regulation of gene expression	Saovaros
14.		13.00-15.00	Transgenic animal	Narisorn
15.	6 Oct 2021	09.00-11.00	Group discussion on integrated neurochemistry research topics	Banthit
Exam II	15 Oct 2021	09.00-16.00	Examination II (Topics 8-14)	Somsong

Assessment criteria:

Assessment criteria	Assessment method	Scoring rubrics
Quiz, Written and oral examination (80%)	Short essay questions (In case of COVID-19 situation, Open book examination, and Oral examination)	Scoring directly from correct answers and keywords.
Group discussion on assigned topic (5%)	Direct observation	observation of class participation (e.g., discussion, asking the question)
Participation in in-class discussion (5%)	Direct observation	observation of class participation (e.g., discussion, asking the question)
Class attendance (10%)	Numbers of classes signed in	Scoring directly from signing in each class

Student's achievement will be graded using symbols: A, B+, B, C+, C, D+, D, and F based on the criteria as follows:

Percentage	Grade
85 -100	A
80 – 84	B+
70 - 79	B
60 - 69	C+
50 - 59	C
45 - 49	D+
40 – 44	D
< 40	F

Notice: Since this course is a core requirement course, if students receive a final grade below “B”, they will need to re-enroll this course in the next academic year.

Date revised: June 9, 2021