Course syllabus
MBMG 513 Gene Expression and Applications
Credits 3(2-2-5)
Academic Year 2018

Course schedule:
Date: Monday-Friday
Time: 09.00-16.00

Institute of Molecular Biosciences, Mahidol University, Salaya Campus.
Room C405: Lecture
The 3rd floor computer laboratory: In silico practice
Room D401: Lab

Course coordinator: Wipa Chungjatupornchai,
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Instructors:
Apinunt Udomkit, Ph.D., Assoc. Prof.
Arpaporn Sutipatanasomboon, Ph.D.
Chalermporn Ongvarrasopone, Ph.D., Assoc. Prof.
Chalongrat Noree, Ph.D.
Duncan R. Smith, Ph.D., Prof.
Kanokporn Triwitayakorn, Ph.D., Assoc. Prof.
Kusol Pootanakit, Ph.D., Asst. Prof.
Nattaya Srisawad, Ph.D.
Panadda Boonserm, Ph.D., Assoc. Prof.
Saovaros Svasti, Ph.D., Assoc. Prof.
Sarin Chimnaronk, Ph.D., Asst. Prof.
Supajit Sraphet, Ph.D.
Wipa Chungjatupornchai, Ph.D., Assoc. Prof.

Lab supporting Staff:
Chanikarn Boonchuay (Sep 25-26, Oct 10-12)
Chaweewan Chimwai (Sep 25-26, Oct 10-12)
Sirirat Faaroonsawat (Sep 25-26)

Course Schedule:

Date/ time	Topics/Details	Number of Hours	Class Activity/ Teaching Media	Lecturer
Sep 24 9.00-11.00	PCR principles and applications	2	Lecture	Kusol Pootanakit
13.00-16.00	In-silico primer design	1-2	Lecture-Lab	Kusol Pootanakit
Sep 25 9.00-11.00	cDNA and genomic libraries	2	Lecture	Panadda Boonserm
13.00-16.00	PCR Lab (PCR and gel preparation)	3	Lab	Wipa Chungjatupornchai Kusol Pootanakit
Sep 26 9.00-12.00	PCR Lab (PCR and agarose gel electrophoresis)	3	Lab	Wipa Chungjatupornchai Kusol Pootanakit
13.00-16.00	In-silico multiple sequence alignment	1-2	Lecture-Lab	Wipa Chungjatupornchai
Sep 27 9.00-10.00	Class discussion	1	Discussion	Wipa Chungjatupornchai Kusol Pootanakit
10.00-12.00	Recombinant selection and screening	2	Lecture	Wipa Chungjatupornchai
Sep 28 9.00-11.00	Expression in *E. coli* of cloned DNA molecules	2	Lecture	Wipa Chungjatupornchai
13.00-15.00	Self-study	3	Self-study	
Oct 1	Self-study	3	Self-study	
	Self-study	3	Self-study	
Oct 2 9.00-11.00	Examination: - PCR principles and applications - cDNA and genomic libraries - Recombinant selection and screening - Expression in *E. coli* of cloned DNA molecules	2	Written examination	
13.00-15.00	Cloning in bacteria other than *E. coli*	2	Lecture	Wipa Chungjatupornchai
Oct 3 9.00-11.00	Next generation sequencing technologies and their applications	2	Lecture	Chalermporn Ongvarrasopone
13.00-15.00	Gene expression in animal: transgenic and knockout animals	2	Lecture	Saovaros Svasti
Oct 4 9.00-11.00	Post-transcriptional regulation	2	Lecture	Sarin Chimnaronk
13.00-15.00	Gene expression in yeast	2	Lecture	Chalongrat Noree
Oct 5	Self-study	3	Self-study	
	Self-study	3	Self-study	

Date/ time	Topics/Details	Number of Hours	Class Activity/ Teaching Media	Lecturer
Oct 8 9.00-11.00	Examination: - Cloning in bacteria other than *E. coli* - Gene expression in yeast - Gene expression in animal: transgenic and knockout animals - Post-transcriptional regulation - NGS technologies and their applications	2	Written examination	
13.00-15.00	Mobile genetic elements	2	Lecture	Apinunt Udomkit
Oct 9 9.00-11.00	Gene expression in plants	2	Lecture	Arpaporn Sutipatanasomboon
13.00-15.00	DNA marker	2	Lecture	Kanokporn Triwitayakorn
Oct 10 9.00-12.00	Genomic DNA analysis	3	Lab	Apinunt Udomkit Kanokporn Triwitayakorn Supajit Sraphet Nattaya Srisawad
13.00-16.00	Genomic DNA analysis	3	Lab	Apinunt Udomkit Kanokporn Triwitayakorn Supajit Sraphet Nattaya Srisawad
Oct 11 9.00-12.00	Genomic DNA analysis	3	Lab	Apinunt Udomkit Kanokporn Triwitayakorn Supajit Sraphet Nattaya Srisawad
13.00-16.00	Genomic DNA analysis	3	Lab	Apinunt Udomkit Kanokporn Triwitayakorn Supajit Sraphet Nattaya Srisawad
Oct 12 9.00-12.00	Genomic DNA analysis	3	Lab	Apinunt Udomkit Kanokporn Triwitayakorn Supajit Sraphet Nattaya Srisawad
13.00-15.00	Virus gene structure and regulation	2	Lecture	Duncan R. Smith
Oct 15	Self-study	3	Self-study	
	Self-study	3	Self-study	
Oct 16 9.00-11.00	Examination: - Mobile genetic elements - Gene expression in plants - DNA marker - Virus gene structure and regulation	2	Written examination	

Date/ time	Topics/Details	Number of Hours	Class Activity/ Teaching Media	Lecturer
11.00-12.00	Final assignment brainstorm	1	Discussion	
13.00-16.00	Self-study	3	Self-study	
Oct 17	Self-study	3	Self-study	
	Self-study	3	Self-study	
Oct 18 9.00-12.00	Poster presentation	3	Presentation	

Evaluation Plan for Learning Outcome

Learning Outcome	Activity	Evaluated in Week	Evaluation Ratio
1. Acquire new knowledge and innovation in gene expression and applications (2.1, 2.2, 2.3)	quiz, written examination	1-4	60%
2. Integrate comprehensive knowledge in gene expression to solve scientific research questions (3.1, 3.2, 3.3)	Problem-based learning, presentation (oral and poster)	1-4	10%
3. Analyze and present lab data by using appropriate information and communication technologies (5.1, 5.2)	Presentation (report, lab notebook)	1-4	10%
4. Demonstrate scientific integrity, responsibility, and safety practice (1.1, 1.2, 1.3)	Class attendance, Lab performance	1-4	15%
5. Demonstrate teamwork, interpersonal skills and responsibilities for the work assignments (4.1, 4.2)	Class participation, Group presentation, Group assignment	1-4	5%

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	Description
80–100	A	Excellent
75–79	B+	Very Good
70–74	B	Good
65–69	C+	Fairly Good
60–64	C	Fair
55–59	D+	Poor
50–54	D	Very Poor
0–49	F	Fail