

Course Syllabus
MBSB 601 Stem Cell and Regenerative Biology
Academic Year 2021

Course ID and name: MBSB 601 Stem Cell and Regenerative Biology
Course coordinator: Asst.Prof. Dr. Narisorn Kitiyanant
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Instructors:

1. Assoc. Prof. Dr.Patompon Wongtrakoongate
2. Asst. Prof. Dr.Narisorn Kitiyanant
3. Asst. Prof. Dr.Tulyapruerk Tawonsawatrak
4. Asst. Prof. Dr.Alisa Tubsuwan
5. Asst. Prof. Dr.Nopporn Jongkamonwiwat
6. Dr.Phetcharat Phanthong

Credits: 3 (3-0-6)
Curriculum: Doctor of Philosophy Program in Systems Biosciences
(Elective course)
Semester offering: Second semester
Prerequisite: None
Course level: Advanced

Course Description:

Pluripotent stem cells; stem cells and cancer; epigenetics in stem cell; lineage determination; germ line stem cells; embryocarcinoma cells and trophoblast stem cells; neural and ectodermal stem cells; hematopoietic stem cells; mesenchymal stem cells; endodermal stem cells; direct reprogramming; biomaterials for regenerative medicine; stem cell engineering for therapeutic purposes; ethics and regulations in regenerative medicine

Course Learning Outcomes (CLOs)

Upon completion of this course, students are able to:

1. Describe basic concepts in stem cell
2. Differentiate each type of stem cells and describe their characteristics
3. Define the molecular mechanisms of cell differentiation
4. Discuss potential applications of stem cells in regenerative medicine
5. Understand the ethical and regulatory aspects of stem cell applications
6. Identify and critically address a scientific question in regenerative biology

Constructive Alignment of Course Content to CLOs and Program ELOs

Lecture No.	Topic	CLOs	Program ELOs
1	Pluripotent stem cells	1, 2, 3	1-3, 6, 8
2	Stem cells and cancer	1, 2	1-3, 6, 8
3	Epigenetics in stem cell	3	1-2, 6, 8
4	Lineage determination	3	1-2, 6-8
5	Germ line stem cells	1, 2, 3	1-2, 6, 8
6	Embryocarcinoma cells and trophoblast stem cells	1, 2, 3	1-2, 6, 8
7	Neural and ectodermal stem cells	1, 2, 3	1-3, 6-8
8	Hematopoietic stem cells	1, 2, 3	1-3, 6-8
9	Mesenchymal stem cells	1, 2, 3	1-3, 6-8
10	Endodermal stem cells	1, 2, 3	1-3, 6-8
11	Direct reprogramming	3	1-2, 6, 8
12	Biomaterials for regenerative medicine	4	1-3, 6-8
13	Stem cell engineering for therapeutic purposes	4	1-3, 6-8
14	Ethics and regulations in regenerative medicine	5	1-2, 6, 8

Course Schedule 2021

Tuesday, Wednesday and Friday, Time 13:00-16:00, A407 and Online

Date	Lecture No.	Topic	Teaching & Learning Strategy	Assessment	Instructor
	1	Pluripotent stem cells	Interactive lecture, Group discussion	Assignment, In-class activities	Phetcharat
	2	Stem cells and cancer	Interactive lecture, Group discussion	Assignment, In-class activities	Patompon
		Self-study			
	3	Epigenetics in stem cell	Interactive lecture, Group discussion	Assignment, In-class activities	Patompon
	4	Lineage determination	Interactive lecture, Group discussion	Assignment, In-class activities	Patompon
	5	Germline stem cells	Interactive lecture, Group discussion	Assignment, In-class activities	Narisorn
		Self-study			
		Assignment/Exam (Lecture 1-5)			
	6	Embryocarcinoma cells and trophoblast stem cells	Interactive lecture	Assignment, In-class activities	Phetcharat
	7	Neural and ectodermal stem cells	Interactive lecture, Group discussion	Assignment, In-class activities	Nopporn
		Self-study			
	8	Hematopoietic stem cells	Interactive lecture, Group discussion	Assignment, In-class activities	Alisa
	9	Mesenchymal stem cells	Interactive lecture, Group discussion	Assignment, In-class activities	Tulyapruerk
	10	Endodermal stem cells	Interactive lecture, Group discussion	Assignment, In-class activities	Narisorn
		Self-study			
		Assignment/Exam (Lecture 6-10)			
	11	Direct reprogramming	Interactive lecture, Group discussion	Assignment, In-class activities	Narisorn
	12	Biomaterials for regenerative medicine	Interactive lecture, Group discussion	Assignment, In-class activities	Tulyapruerk
	13	Stem cell engineering for therapeutic purposes	Interactive lecture, Group discussion	Assignment, In-class activities	Narisorn
	14	Ethics and regulation in regenerative medicine	Interactive lecture	Assignment	Narisorn
		Self-study			
		Assignment/Exam (Lecture 11-14)			

Assignments

1. Reading, practical or problem-solving assignments from instructors
2. Paper discussions

Assessment Criteria

Assessment Criteria	Assessment Method	Scoring Rubric
Assignment (70%)	1) Take-home assignments	1) Content 2) Composition 3) Comprehension 4) Creativity
Attendance/participation (10%)	1) In-class activities	1) Attendance and punctuality 2) Participation 3) Distracting behaviors 4) General attitude towards learning
Discussion (20%)	1) Group discussion	1) Content 2) Effort 3) Creativity 4) Cooperation

Students must receive a score of 60% or more to pass the course. Student's achievement will be graded using symbols: A, B+, B, C+, C and F based on the following criteria;

Percentage	Grade	Description
≥ 80%	A	Excellent
75-79.99%	B ⁺	Good
70-74.99%	B	Fairly good
65-69.99%	C ⁺	Fair
60-64.99%	C	Poor
< 60%	F	Fail

However, a final grade will be adjusted based on frequency distribution of student's scores from the whole course.

Appeal Procedure

Should the students have any appeal regarding the assessments or grade, inquiry can be made to the instructors and/or the course coordinator immediately either by direct contact, telephone or email.

Course Reading Materials

A series of textbooks, online resources and appropriate journal articles will be introduced throughout the course by the instructors. These materials may be found on the google classroom.

General Inquiry

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Date revised: October 10, 2021