

BMS3101: CELL TRANSPORT AND SIGNALLING

Effective Term

Semester B 2024/25

Part I Course Overview

Course Title

Cell Transport and Signalling

Subject Code

BMS - Biomedical Sciences

Course Number

3101

Academic Unit

Biomedical Sciences (BMS)

College/School

College of Biomedicine (BD)

Course Duration

One Semester

Credit Units

3

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

BCH3856 Cell Transport and Signalling (for students who took BCH3856 during academic year from 2011/2012 to 2014/2015)

Exclusive Courses

Nil

Part II Course Details

Abstract

This advanced cell biology course deals with the molecular biology of cell signalling. The students will gain an insight into the fundamental processes of the cellular uptake of molecules by membrane receptors, including membrane-protein and

protein-protein interactions, and their associated effectors. The objective is to provide students with current knowledge of cell signaling from the cell surface to the nucleus, integrating cellular regulatory signals. Students will learn about insulin and the signal transduction cascades it invokes, and neural signalling. This course builds on (and complements) knowledge covered in Cell Biology, and underpins the more advanced concepts that are covered Physiology, Molecular Biology and Final Year Project.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Relate structures of the membrane receptors to their functions in cell transport	20		x	
2	Explore the fundamental mechanisms of membrane transport – both trans-membrane transport and membrane-vesicle-mediated transport	20	x	x	
3	Apply the principles of cellular uptake of molecules and information to signal transduction pathways originating at membranes	20		x	x
4	Integrate cell signalling concepts to the cardiovascular, endocrine, and nervous system	40	x	x	x

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

LTAs		Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures	Teaching and learning will be based on lectures to investigate the mechanisms of membrane transport and cell communications, and to comprehend different types of cell signalling pathways	1, 2, 3, 4	

2	Tutorials	Teaching and learning will be based on tutorials to investigate the mechanisms of membrane transport and cell communications, and to comprehend different types of cell signalling pathways	1, 2, 3, 4	
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Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Continuous Assessment in the mid-term exam	1, 2, 3	30

Continuous Assessment (%)

30

Examination (%)

70

Examination Duration (Hours)

2

Additional Information for ATs

Minimum Passing Requirement: A minimum of 30% in continuous assessment as well as in examination, in addition to a minimum of 40% in continuous assessment and examination taken together.

Assessment Rubrics (AR)**Assessment Task**

1. Mid-term exam

Criterion

To test students' application of material taught in class and evaluate their performance based on their performance on the exam

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

2. Final examination

Criterion

To test students' application of material taught in class and evaluate their performance based on their performance on the exam

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

- Membrane receptors and membrane transport mechanism
- Protein structure and function
- Signal transduction
- Endocrine, paracrine and synaptic signalling, G-Protein linked signalling, enzyme-linked signalling (kinase and phosphatase), and receptor tyrosine kinase signalling
- Cell communication in the cardiovascular, endocrine, and nervous system
- Cell signalling underlying human-to-human interaction

Reading List**Compulsory Readings**

Title	
1	Lewin's CELLS, Third Edition, ISBN-13: 9781284029390
2	http://www.jblearning.com/catalog/9781284029390/

Additional Readings

Title	
1	Nil