

# SEMESTER I

## LSM4232 ADVANCED CELL BIOLOGY

**Prerequisite:** LSM2103

**Workload:** 30 lecture hours + 8 tutorial hours + 10 hours for CA, student presentations and revision

**Course description:**

This module will explore the changes that occur in human cells as they grow, mature, differentiate, and either commit to cell death or renew themselves. Insights into the mechanisms that govern the various developmental alterations that occur will be discussed. Emphasis will be placed on understanding the cellular and molecular mechanisms that lend themselves to experimental manipulation.

S/N	Topics	Lecture Hrs
1.	<b>Cell Dynamics Control</b> <ul style="list-style-type: none"> <li>• Morphogenesis, Differentiation and Development</li> <li>• Small GTPases and their regulators as major cellular switches</li> <li>• Cytoskeletal networks               <ul style="list-style-type: none"> <li>- Interplay in cell morphogenesis, cell motility, cell division, organogenesis and development</li> </ul> </li> </ul>	10 Low Boon Chuan
2.	<b>Cell differentiation - mechanisms</b> <ul style="list-style-type: none"> <li>• Embryonic and postnatal myogenesis</li> <li>• Differentiation of skeletal muscle</li> <li>• Stem cells and Notch signalling in adult myogenesis and ageing</li> <li>• Muscle degeneration mechanisms in muscular dystrophies</li> </ul>	10 Reshma Taneja
3.	<b>WW Domain and Hippo-YAP Pathway</b>	4 Marius Sudol
4.	<b>Signalling and ROS in ageing and disease</b> <ul style="list-style-type: none"> <li>• Oxidative stress and mitochondrial ageing               <ul style="list-style-type: none"> <li>○ DNA</li> <li>○ Proteins</li> </ul> </li> <li>• Regulation of cell death signalling               <ul style="list-style-type: none"> <li>○ Receptor and non-receptor death signalling</li> </ul> </li> <li>• ROS, KRAS and drug discovery</li> </ul>	4 Shazib Pervaiz
Total lectures (Including guest lecture):		28h
Tutorials:		6h
CA, student presentations and revision:		18h
<b>Total hours:</b>		<b>52h</b>

**MAIN REFERENCES:** Selected papers

**SUPPLEMENTARY TEXT BOOKS:**

(1) Genes VII (Lewin)

(2) Molecular Biology of the Cell (6<sup>th</sup> Edition by Alberts, Johnson, Lewis, Morgan, Raff, Roberts & Walter; Publisher: Garland Science)

**MODES OF ASSESSMENT:**

50% CA (1 x short essay question test, 1 x student presentation)

50% Final Exam (60 x multiple choice questions, closed book)

**MODULE COORDINATOR:**

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