

SEMESTER I & II
LSM2191 LABORATORY TECHNIQUES IN LIFE SCIENCES

Prerequisite: LSM1102 or LSM1106

Workload: 12 lecture hours + 8 tutorial hours + 40 practical hours

This module introduces the theory and practical applications of techniques used in molecular biology and protein biochemistry. Knowledge in recombinant DNA techniques, such as RNA isolation, reverse transcription, polymerase chain reaction, recombinant DNA construction and recombinant protein expression; and in protein purification, such as liquid chromatography, polyacrylamide gel electrophoresis and western blotting, will be integrated with laboratory practice.

S/N	Topics	Lecture hours	
		Sem 1	Sem 2
1	Overview and RNA Methodologies: RNA Isolation and mRNA Expression	1.5h (Jinlu WU)	1.5h (NL)
2	Molecular Cloning I	1.5h (Jinlu WU)	1.5h (NL)
3	Molecular Cloning II	1.5h (Jinlu WU)	1.5h (NL)
4	DNA Sequencing	1.5h (Jinlu WU)	1.5h (NL)
5	Protein expression and extraction including buffer preparation	1.5h (Lu GAN)	1.5h (MC)
6	Chromatographic methods: ion exchange, gel filtration and affinity chromatography	1.5h (Lu GAN)	1.5h (MC)
7	Electrophoresis and Western blot	1.5h (Lu GAN)	1.5h (MC)
8	Strategies for developing protein purification methods	1.5h (Lu GAN)	1.5h (MC)
	Practicals/Tutorials:	48h	48h
	Total hours:	60h	60h

TEXT BOOK:

- (1) Current Protocols in Molecular Biology by Fred M. Ausubel et al, John Wiley & Sons, Inc.
- (2) Protein Purification: Principles, High Resolution Methods, and Applications, Third Edition, edited by Jan-Christer Janson, Wiley.

MODE OF ASSESSMENT:

- 50% - Lab reports
- 50% - Continuous Assessments

MODULE CO-ORDINATORS:

- | | |
|------------------------------|---|
| Dr Lu Gan (Sem I) | (Tel: 6516-8868; E-mail: lu@anaphase.org) |
| A/P Maxey Chung (Sem II) | (Tel: 6516-3252; Email: bchcm@nus.edu.sg) |
| A/P Norbert Lehming (Sem II) | (Tel: 6516-3499; Email: micln@nus.edu.sg) |

LECTURERS:

Dr Lu Gan (Sem I)	(Tel: 6516-8868; E-mail: lu@anaphase.org)
Dr Wu Jinlu (Sem I)	(Tel: 6516-7712; E-mail: dbsws@nus.edu.sg)
A/P Norbert Lehming (Sem II) (NL)	(Tel: 6516-3499; E-mail: micln@nus.edu.sg)
A/P Maxey Chung (Sem II) (MC)	(Tel: 6516-3252; E-mail: bchcm@nus.edu.sg)