SEMESTER I & II
LSM3231 – PROTEIN STRCUTURE AND FUNCTION

Prerequisite: LSM2101
Workload: 26 lecture hours + 6 tutorial hours + 18 laboratory hours
This module aims to provide a strong foundation in the study of protein structure and function. The following topics that will be covered: structures and structural complexity of proteins and methods used to determine their primary, secondary and tertiary structures; biological functions of proteins in terms of their regulatory, structural, protective and transport roles; the catalytic action of enzymes, their mechanism of action and regulation; various approaches used in studying the structure-function relationships of proteins.

S/N	Topics	Lecture Hours
1.	**Introduction** **Protein structures** Overview of protein structure Structural patterns in protein Varieties of protein structures **Protein function** Structural diversity reflects functional diversity in globular proteins Structure-function relationships in selected protein families Protein folding and molecular chaperones	Maxey Chung 8 h
2.	**Advanced enzymology** Enzymes, enzyme reaction kinetics, mechanism of action, and allosteric control of enzyme activity **Probing structure –function relationships** Chemical modification Epitope mapping, Site-directed mutagenesis	Theresa Tan 8 h
3.	**Methods for determination of protein structures** Primary structure by Edman degradation and mass spectrometry Solid phase peptide synthesis and applications of synthetic peptides Secondary structure by circular dichroism and theoretical methods Tertiary structure by x-ray diffraction and NMR Prediction, engineering and design of protein structure	Maxey Chung 4 Henry Mok 6 hr
	Total Lectures: 26h **Tutorials: 6h** **Practicals: 6x3= 18h**	
	Total hours:	50h

REFERRENCE BOOKS: Introduction to Protein Structure (2nd Edition) by Carl Branden and John Tooze; Introduction to Protein Architecture by Arthur M. Lesk , and Introduction to Protein Science by Arthur M. Lesk.

MODE OF ASSESSMENT: CA, 40% (short answer questions) ; semestral examination, 60% (short answer and long answer questions)

MODULE CO-ORDINATORS:
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LECTURERS:
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