

BIOS 2014 FUNCTIONAL PROTEINS AND GENES

Legacy Code 300936

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Student Contribution Band

Check your fees via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Identify and explain biologically important chemical bonds and functional groups and describe their interaction.
2. Recognise and describe the structure of monomeric units of major biomolecules in a cell.
3. Explain how complex biomolecules form through polymerisation, chemical modification or aggregation of these monomeric units form complex functional or structural molecules.
4. Discuss key metabolic processes, their control and cellular location.
5. Relate different biomolecules to different cellular structures and processes.
6. Handle biomolecules for analysis in a laboratory.
7. Collect, record and analyse laboratory data in a lab book consistent with legal standards.
8. Be able to perform basic biochemical calculations (mole calculations, dilutions, unit conversion, standard curve and basic enzymatic calculations).
9. Work as a member of a group.

Subject Content

1. Overview of Biochemistry
 - The cell, groups of important biomolecules, bonds, Functional groups, genes to proteins
 - The aqueous environment
2. Biomolecules - Lipids
 - The Chemistry and structure of fatty acids
 - Membranes: phospholipids and glycolipids
3. Biomolecules - Introduction to Carbohydrates and Glycobiology
 - The Chemistry and nomenclature of mono, di and polysaccharides
 - Heteropolysaccharides: cellulose, starch, glycogen and The extracellular matrix
4. Biomolecules - Nucleic acids
 - Ribose, deoxyribose, phosphodiester bonds, bases
 - structural differences between RNA and DNA
5. Biomolecules - Proteins
 - Amino acids: functional groups; acid base properties; symbols
 - structure of proteins: peptide bonds, protein folding, pictorial representation of protein structure
 - Classification and functions of proteins
 - protein Packaging and post translational modification
 - protein degradation
6. Introduction to metabolism
 - Overview of anabolic and catabolic pathways and their regulation
 - Characteristics of enzymes: active sites; catalytic principles; Basic enzyme kinetics
 - introduction to important branch Point, High energy compounds and co-Factors
7. Quantitative aspects of Biochemistry

- handling and Analysing biomolecules in A laboratory
- developing independence in data organisation, recording and calculations
- maintaining A legal Standard laboratory note book

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Mandatory Group Task
Final Examination	2 hours	50	Y	Individual
Written Assignmentwords - research assigned protein	Max 500	10	N	Individual
Laboratory Component semester - (a) Laboratory Book completeness/ correctness, (b) Practical Skills Quiz	Throughout 20		N	Individual
Quiz - (a) Post-laboratory questions (online), (b) Functional Molecules Quiz	Throughout 20 semester		N	Individual

Prescribed Texts

- Tymoczko, JL, Berg, JM & Stryer, L 2013, Biochemistry: a short course, 2nd edn, W.H. Freeman, New York.