Unit 17: The Building Blocks of Life

Level:	**4**
Unit type:	**Optional (General Healthcare Science)**
Credit value:	**20**
Guided learning hours:	**160**

Unit summary

In this unit, you will develop an understanding of the classification, structure and function of the human body, together with a knowledge of health, disease, disorder and dysfunction relevant to life sciences. You are expected to apply and contextualise your knowledge and skills, performing routine technical skills and developing and building your professional practice in accordance with Good Scientific Practice.

Unit assessment requirements

There are no specific assessment requirements for this unit. Please refer to the assessment strategy in *Annexe B*.

Additional information

AC1.1 – 1.3 should include:

- glucose synthesis and storage, gluconeogenesis, glycolysis
- cholesterol synthesis and metabolism
- fatty acid synthesis and metabolism; triglycerides
- the assembly of amino acids into peptides and proteins
- essential amino acids.

AC1.5 requires **one** example, which could include:

- acquired, e.g.
    - diabetic ketoacidosis
    - hyperosmolar coma
    - hypoglycaemia
- rare inborn errors of metabolism (i.e., genetic defects), e.g. episodic lactic acidosis.

AC1.6 requires **one** example, which could include:

- Gaucher's disease
- Tay-Sachs disease
- Niemann-Pick disease.

AC1.7 requires **one** example, which could include:

- oculocutaneous albinism
- phenylketonuria
- homocystinuria
- tyrosinemia
- maple syrup urine disease.

AC2.4 includes:

- definition of the term 'genetic mutation'.

AC2.8 includes the difference between:

- genetics
- genomics
- the term 'human genome'.

AC2.9 requires **two** examples, which could include:

- Down syndrome
- Cystic fibrosis
- Huntington's disease
- Sickle-cell disease
- Haemophilia
- Turner syndrome
- Klinefelter syndrome
- Rett syndrome.

Learning outcomes and assessment criteria

To pass this unit, learners need to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria outline the requirements that the learner is expected to meet to achieve the learning outcomes and the unit.

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
1	Understand the structure and function of the major classes of carbohydrates, lipids and amino acids, nucleic acids, genes and chromosomes	1.1	Explain the structure and function of the major classes of carbohydrates			
		1.2	Explain the structure and function of the major classes of lipids			
		1.3	Explain the structure and function of the major classes of amino acids			
		1.4	Explain the structure and function of the major classes of nucleic acids, genes, and chromosomes			
		1.5	Discuss how specific disease is associated with abnormal carbohydrate structure or function			
		1.6	Discuss how specific disease is associated with abnormal lipid structure or function			
		1.7	Discuss how specific disease is associated with abnormal amino acid structure or function			
		1.8	Discuss how specific disease is associated with abnormal nucleic acid, gene and chromosome structure or function			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
2	Understand the underpinning of genetics and the human genome	2.1	Explain the term 'cell biology' and how knowledge of cell biology contributes to own role			
		2.2	Compare the process of meiosis and mitosis			
		2.3	Explain the process of chromosome segregation			
		2.4	Explain how gene mutations can be classified			
		2.5	Explain each mode of inheritance			
		2.6	Describe a genetic condition that illustrates each mode of inheritance			
		2.7	Explain sources of genetic variation			
		2.8	Discuss the ethical, legal, and social implications of the development of genomics in healthcare			
		2.9	Explain the potential impact of genetic diseases on the patient and their families			

Learning outcomes		Assessment criteria		Evidence type	Portfolio reference	Date
3	Understand the classification and role of proteins in the structure, structural integrity and function of biological systems	3.1	Explain how proteins are classified			
		3.2	Explain how proteins are associated with cellular differentiation and ultimately human biological systems			
		3.3	Describe basic and advanced processes of human biological systems			
		3.4	Explain the structure, structural integrity, and function of a specific biological system			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)