Biochemistry and Metabolism

Module Information

2022.01, Approved

Summary Information

Module Code	4004SPS
Formal Module Title	Biochemistry and Metabolism
Owning School	Sport and Exercise Sciences
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 4
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
Sport and Exercise Sciences

Learning Methods

Learning Method Type	Hours
Lecture	12
Practical	16
Workshop	12

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-CTY	CTY	January	12 Weeks

Aims and Outcomes

Aims	This module builds upon the broader systems level module (4105SPOSCI) to consider physiology and metabolism at the molecular level. The module aims to take the student through a journey from consumption of food, and the biochemical/metabolic processes that are necessary to generate energy and synthesise tissue, through to how the body systems deal with waste. It explores how dysregulation of biochemical/metabolic pathways can lead to disease states and how optimisation of nutrition can reduce risk of disease and enhance exercise performance.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Define the underlying concepts and principles of biochemistry and metabolism (from initial food intake, digestion, absorption, transport, metabolism and finally excretion).
MLO2	2	Identify the role of biochemistry and metabolism in health and disease.
MLO3	3	Analyse and interpret biochemical/metabolic data in order to develop lines of argument and make sound judgements in accordance with nutrition and exercise theories.

Module Content

Outline Syllabus	Digestion and absorption and its regulation: Salivary glans; Stomach; Small intestine; Large intestine; Hormonal/neural; regulation.Energy metabolism:Glycolysis, glycogenolysis; Lipid transport (carnitine shuttle); Beta-oxidation; TCA (Kreb's cycle); Electron transport chain; Gluconeogenesis; Cori cycle; Fatty acid synthesis, cholesterol synthesis.Protein metabolism:Protein catabolism (excretion of waste); Protein anabolism (muscle protein synthesis).Non communicable diseases related to nutrition:Cancers; CVD; Diabetes.
Module Overview	This module aims to take you through a journey, from consumption of food and the biochemical/metabolic processes that are necessary to generate energy and synthesise tissue, through to how the body systems deal with waste. It explores how dysregulation of biochemical/metabolic pathways can lead to disease states and how optimisation of nutrition can reduce risk of disease and enhance exercise performance.
Additional Information	The Association for Nutrition (AfN) competencies covered in this module include: CC1a The human/ animal body and its functions, especially digestion, absorption, excretion, respiration, fluid and electrolyte balance, cardiovascular, neuro-endocrine, musculoskeletal and haematological systems, immunity and thermoregulation, energy balance and physical activity.CC1b Mechanisms for the integration of metabolism, at molecular, cellular and whole-body levels for either human or animal systems.CC1d Nature and extent of metabolic demand for nutrients.CC1i Nutrition in health and disease, consequences of an unbalanced diet for either human or animal systems.CC1j Nature of common conditions that require dietary manipulation or can affect physical activity, such as obesity, diabetes, hypertension, cardiovascular disease, cancer etc. for either human or animal systems.CC1m Ability to carry out sample selection and to ensure validity, accuracy, calibration, precision, replicability and highlight uncertainty during collection in accordance with the basic principles of good clinical practice.CC1n Ability to obtain, record, collate, analyse, interpret and report nutrition-related data using appropriate qualitative and quantitative research and statistical methods in the field and/or laboratory and/or intervention studies, working individually or in a group, as is most appropriate for the discipline under study.CC1o Prepare, process, interpret and present data, using appropriate qualitative and quantitative techniques, statistical programmes, spreadsheets and programs for presenting data visually.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Dissertation	Lab Report (2500 words)	60	0	MLO1, MLO3

Centralised Exam	MCQ	40	1	MLO1, MLO2

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Ian Davies	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings