Molecular Nutrition

Module Information

2022.01, Approved

Summary Information

Module Code	6003SPS
Formal Module Title	Molecular Nutrition
Owning School	Sport and Exercise Sciences
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 6
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
Sport and Exercise Sciences

Learning Methods

Learning Method Type	Hours
Lecture	20
Practical	10
Workshop	10

Module Offering(s)

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

Aims and Outcomes

Aims	The module builds upon previous biochemistry and physiology modules, providing an in-depth exploration of the expanding field of molecular nutrition. Contemporary researching is rapidly expanding our knowledge of how various dietary bioactive compounds can modulate biochemical systems, and how this can be regulated at the level of the gene. Furthermore, progress in analytical techniques now allow the analysis of myriad molecules from one sample (e.g. plasma) that can provide molecular fingerprints, which are important for advances in precision and personalised nutrition. The module aims to introduce and explore these concepts, with a critical eye, with the use of clinical and preventive health examples.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Critically evaluate the core concepts of nutrients as metabolic modulators.
MLO2	2	Discuss the clinical role of nutrigenomics and nutrigenetics.
MLO3	3	Discuss the use of Omics technology in advancement of precision (personalised) nutrition.

Module Content

Outline Syllabus	Nutrition and Cell Biology:Molecules of the cells; Cell membranes and enzymes; cellular mechanisms in relation to Nutrition and Exercise; Nutrigenetics and Nutrigenomics.Nutrition and Metabolic dysregulation:The role of food bioactive compounds in inflammatory disease; Nutritional and Exercise strategies for obesity, metabolic syndrome and diabetes; Nutritional and Exercise strategies for cancer; The role of nutrition and exercise in gut health.Personalised/precision nutrition:Dietary treatment for inherited conditions/diseases; Role of food bioactive compounds in gene expression; Effects of dietary manipulation on genotypes (epigenetics); Future nutrition challenges using Omics technology; Use of microbiome as a predictor of metabolic disease.
Module Overview	This module builds upon previous biochemistry and physiology modules, providing an in-depth exploration of the expanding field of molecular nutrition. Contemporary researching is rapidly expanding our knowledge of how various dietary bioactive compounds can modulate biochemical systems and how this can be regulated at the level of the gene. Furthermore, progress in analytical techniques now allow the analysis of myriad molecules from one sample (e.g. plasma) that can provide molecular fingerprints, which are important for advances in precision and personalised nutrition. The module aims to introduce and explore these concepts, with a critical eye, with the use of clinical and preventive health examples.
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. CC1e How nutrients are used by the body (either human or animal) consequences of deficiency and assessment of nutritional status. CC1h Digestion, absorption, transportation and storage of nutrients and non-nutrient components of foods or feeds for either human or animal systems. 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.CC1i Nutrition in health and disease, consequences of an unbalanced diet for either human or animal systems.CC4c Scientific basis of the safety and health promoting properties of nutrients and nonnutrient components of food or feed, based on knowledge of the metabolic effects of nutrients, anti-nutrients, toxicants, additives, pharmacologically active agents (drugs); nutrient-nutrient interactions, nutrient-gene interactions, ‘nutraceuticals’, functional foods, and any other metabolically active constituents of foods or feeds and the diet.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Essay	Essay (2500-word)	60	0	MLO2, MLO3
Centralised Exam	Exam (2-hour)	40	2	MLO1

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Abdulmannan Fadel	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings