

Summary Information

Module Code	7164SPOSCI
Formal Module Title	Integrative Physiology and Metabolic Regulation
Owning School	Sport and Exercise Sciences
Career	Postgraduate Taught
Credits	20
Academic level	FHEQ Level 7
Grading Schema	50

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Sam Shepherd	Yes	N/A

Module Team Member

Contact Name	Applies to all offerings	Offerings
Matthew Cocks	Yes	N/A
Ellen Dawson	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings
--------------	--------------------------	-----------

Teaching Responsibility

LJMU Schools involved in Delivery
Sport and Exercise Sciences

Learning Methods

Learning Method Type	Hours
Lecture	18
Practical	6

Module Offering(s)

Offering Code	Location	Start Month	Duration
JAN-CTY	CTY	January	12 Weeks

Aims and Outcomes

Aims	The aims of this module are to develop and enhance the students' knowledge and understanding of 1) the fuels used during endurance exercise as function of exercise intensity and duration to include the underlying fuel switching mechanisms; of 2) the effects of endurance exercise and high intensity interval training (HIIT) on the adaptations in skeletal muscle and its microvasculature and the mechanisms leading to an increased oxidative capacity and improved metabolic health; and 3) the metabolic maladaptation that occurs in sedentary and obese individuals and the mechanisms by which this leads to the development of skeletal muscle function loss, chronic diseases and premature mortality. In addition, an important aim of this module is to train the students in assessment 1 in the skill to write an integrative essay, combining information from interactive lectures, group discussions, textbooks and scientific publications, so that they can answer the exam questions in this style and are ready to write future scientific publications as PhD students or future researchers.
-------------	--

Learning Outcomes

After completing the module the student should be able to:

Code	Description
MLO1	Synthesise ideas or information in innovative ways to generate transformative solutions or construct arguments that integrate and extend knowledge
MLO2	Demonstrate deep theoretical understanding of exercise physiology, e.g. encompassing molecular mechanisms and whole-body integrate physiology
MLO3	Develop critical responses to existing theoretical discourses, methodologies or practices and suggest new concepts or approaches
MLO4	Undertake analysis of complex, incomplete or contradictory evidence/data and judge the appropriateness of the enquiry methodologies used

Module Content

Outline Syllabus

The fuel mixture during exercise as function of duration and intensity
Mechanisms underlying the switching of fuels
Signals and regulation of mitochondrial biogenesis
Signals and regulation of angiogenesis (formation of new capillaries)
Protein and amino acid metabolism during exercise and workload changes
The fuel mixture investigated hands on in the exercise laboratory
Translating indirect calorimetry print outs in total lipid and carbohydrate oxidation
Remodelling of intramuscular lipid droplets by various exercise training modes
Exercise training to increase capillary density and microvascular vasodilator function.

Module Overview

The purpose of this module is to develop and enhance your understanding of the adaptive responses to acute and chronic (training) exercise using human muscle and cardiovascular physiology, biochemistry and molecular biology as the underpinning disciplines. The module aims to:

give you integrative insight in the development of exercise prescriptions to maximize athletic performance across a large range of sport disciplines

improve physical performance and health in people of all ages and covering a wide range of physical activity levels and exercise capacities

Additional Information

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Learning Outcome Mapping
Essay	Essay	40	0	MLO3, MLO4, MLO2, MLO1
Centralised Exam	Examination	60	2	MLO3, MLO4, MLO2, MLO1