

LF129-15 Physiology, Neurobiology, and Cell Signalling

24/25

Department

Life Sciences

Level

Undergraduate Level 1

Module leader

Mark Wall

Credit value

15

Module duration

10 weeks

Assessment

Multiple

Study location

University of Warwick main campus, Coventry

Description

Introductory description

Physiology is the study of how the human body works and can be determined at the sub-cellular to whole organism level. In order to remain healthy, many physiological variables must be maintained within narrow limits. These variables include body temperature, blood pressure, blood glucose, and oxygen and carbon dioxide levels in the blood. The ability of the body to maintain the constancy of such variables is called homeostasis and understanding how this is achieved is a central goal of physiology. This module provides a framework for understanding homeostasis by covering the major organ systems of the body. The final lecture integrates the knowledge from individual organ systems to understand how the whole body maintains homeostasis in environmental extremes.

[Module web page](#)

Module aims

The module builds on knowledge obtained at A-level and provides a foundation in physiology. In the physiology part of the module the aim is to provide an understanding of how parts of the body functions and how these parts work together in the whole organism. The focus will be on cellular

signalling, the nervous system, the cardiovascular and respiratory system, as well as special senses. This information is then integrated to understand the physiological basis of adaptation to environmental conditions such as altitude, depth, cold and heat.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Cell signalling: Students are introduced to transmembrane and cellular signalling. These concepts are then furthered to provide an introduction of hormonal signalling and its effect on physiology.

Neurobiology: Nervous system structure and function, neurons and glia, resting potential, action potential, synaptic transmission, sensory and motor systems, the autonomic nervous system, muscle contraction.

Cardiovascular system: The heart as a pump; properties and physiological regulation of the systemic circulation; introduction to the pulmonary circulation; response to blood loss, response to exercise

Respiration: Anatomy and physiology (including mechanics of respiration, gaseous exchange, nervous control of breathing).

Special senses: Physiology of vision and hearing

Integrated Physiology: Combining material from physiology and metabolism lectures to understand adaptation to extreme conditions such as altitude, depth, hot and cold.

Labs:

Physiology lab: An active learning environment activity where students will practically apply their new found knowledge on cardiorespiratory coupling to consolidate their understanding of the subject

Virtual Nerve: An active learning environment activity where students will practically apply their new found knowledge on neurobiology to consolidate their understanding of the subject

Learning outcomes

By the end of the module, students should be able to:

- At the end of this module the students should have acquired a thorough understanding of the basics of Neurobiology
- At the end of this module the students should have acquired a thorough understanding of the basics of Physiology
- At the end of this module the students should have acquired a thorough understanding of the basics of special senses

Indicative reading list

1. Illustrative Bibliography

Berg, Tymoczko and Stryer. Biochemistry 8th edition 2015

Vanders Human Physiology: The mechanism of body function 14th edition (McGraw Hill).

G Pocock & CH Richards Human Physiology: The Basis of Medicine. 5th Edition. OUP 2017

Berne & Levy Principles of Physiology 5th edition 2006

Associated reading

Life at the Extremes. Frances Ashcroft Flamingo 2000

Subject specific skills

At the end of this part of the module students should have acquired:

- A) An understanding of neurobiology
- B) An understanding of the cardiovascular system
- C) An understanding of the respiratory system
- D) An understanding of the renal system
- E) An understanding of special senses.
- F) Some appreciation of how this knowledge can be applied to understand how whole organisms adapt to extreme conditions.

Transferable skills

- 1. Critical appraisal of source material
- 2. Self directed learning
- 3. Adult learning

Study

Study time

Type	Required
Lectures	22 sessions of 1 hour (15%)
Supervised practical classes	6 sessions of 1 hour (4%)
Private study	122 hours (81%)
Total	150 hours

Private study description

Independent learning, self directed learning and revision for exams.

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group B

	Weighting	Study time	Eligible for self-certification
Test	100%		No
MCQ based exam and short answer questions			

Assessment group R

	Weighting	Study time	Eligible for self-certification
MCQ and short answer	100%		No
100% resit whole module reassessment			

Feedback on assessment

Cohort level feedback provided

[Past exam papers for LF129](#)

Availability

Courses

This module is Core for:

- Year 1 of UBSA-C700 Undergraduate Biochemistry
- ULFA-C1A2 Undergraduate Biochemistry (MBio)
 - Year 1 of C1A2 Biochemistry
 - Year 1 of C700 Biochemistry
- Year 1 of ULFA-C702 Undergraduate Biochemistry (with Placement Year)
- Year 1 of ULFA-C1A6 Undergraduate Biochemistry with Industrial Placement (MBio)
- Year 1 of UBSA-C1B9 Undergraduate Biomedical Science
- ULFA-C1A3 Undergraduate Biomedical Science (MBio)

- Year 1 of C1A3 Biomedical Science
- Year 1 of C1B9 Biomedical Science
- Year 1 of ULFA-C1A7 Undergraduate Biomedical Science with Industrial Placement (MBio)
- Year 1 of ULFA-CB18 Undergraduate Biomedical Science with Placement Year
- Year 1 of ULFA-B140 Undergraduate Neuroscience (BSc)
- Year 1 of ULFA-B142 Undergraduate Neuroscience (MBio)
- Year 1 of ULFA-B143 Undergraduate Neuroscience (with Industrial Placement) (MBio)
- Year 1 of ULFA-B141 Undergraduate Neuroscience (with Placement Year) (BSc)

This module is Core optional for:

- Year 1 of UBSA-3 Undergraduate Biological Sciences
- Year 1 of ULFA-C1A1 Undergraduate Biological Sciences (MBio)
- Year 1 of ULFA-C113 Undergraduate Biological Sciences (with Placement Year)
- Year 1 of ULFA-C1A5 Undergraduate Biological Sciences with Industrial Placement (MBio)