

# MD2B4-30 Interactions: Environment and Genes

**25/26**

**Department**

Warwick Medical School

**Level**

Undergraduate Level 2

**Module leader**

Olalekan Uthman

**Credit value**

30

**Module duration**

7 weeks

**Assessment**

40% coursework, 60% exam

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

This module aims to facilitate a broad base understanding of health and medical conditions by integrating knowledge and approaches from epigenetics, genes, pharmacology, clinical trials, environmental health, migration, politics and policy, both locally and globally.

[Module web page](#)

### Module aims

To facilitate an in-depth understanding of interactions as they pertain to the environment (both internal and external) and the body in health and disease. Students will experience integrated perspectives about interactions from the course themes and previous module content that is consolidated and advanced through case based learning.

### 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.

This module will follow the integrated pathogens module and the assessment for that block. The topics covered in this module will be complex because they are interrelated and students will need to exercise good pattern recognition and cognitive flexibility. Again, the module will build from taught content with lecture theatre based presentations and interactive presentations as well as case-based learning sessions, all supported by TEL and online content.

In the biomedical sciences, students will cover interactions between epigenome, genome, environment and health. Areas such as pharmacology including pharmacokinetics, pharmacodynamics and clinical trials will provide discussion of specific case vignettes. Students will also revisit circadian rhythm and sleep and their complex interaction with many previous module content areas.

In the health sciences, the extended topics of planetary health will be introduced. The concepts of decision making in health will be re-visited and extended to include interactions between politics, policies and the law. With exploration of population migration and the interactions between the environment, health and society.

The cases in this module will explore contemporary examples of diseases which can be caused by the external environment, and corresponding the importance of understanding the internal environment for the treatment of disease and illness.

## **Learning outcomes**

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

- 1. To develop a broad understanding of the key concepts, principles and theories, which will support a multidisciplinary approach to understanding environmental associations with health
- 2. Describe the effectiveness and dynamics of therapeutic interventions and to explain the steps required for ethical approaches and clinical trials
- 3. To examine environmental factors, genetic material, health and disease, and explore the broad implications of environmental change for the continuation of a sustainable society
- 4. To interrelate socio-economic, occupational and industrial factors, and a healthy environment
- 5. To consider local and global causes and consequences of conflict induced displacement.
- 6. To demonstrate understanding of pain, sleep, pharmacology and their interrelationships in health and disease
- 7. To develop and use strategic planning and reasoning skills to engage with others to individually or collectively put forward structured ideas that can have a positive influence on local and global challenges in health

## **Indicative reading list**

1. Timbrell J. (2002) Introduction to toxicology. 3rd edition. Informa Healthcare / CRC Press.
2. Rang et al. (2011) Pharmacology. 7th edition. Churchill Livingstone.
3. Hope et al., (2008) Medical ethics and the law: the core curriculum. 2nd edition. Edinburgh: Churchill Livingstone.
4. Watts et al. (2018) The Lancet Countdown on health and climate change: from 25 years of inaction to a global transformation for public health. Lancet. 391 (10120): 581-630.

5. Paavola J. (2017) Health impacts of climate change and health and social inequalities in the UK. *Environ Health*. 16 (Suppl 1): 113.
6. Cappuccio et al. (2018) Sleep, health, and society: From Aetiology to Public Health. 2nd edition. OUP Oxford.
7. Alberts et al. (2014) Molecular biology of the cell. 6th edition. W.W. Norton and Company.

[View reading list on Talis Aspire](#)

## **Interdisciplinary**

Students will explore the complex interactions between the environment, genes, and health through an integrated, case-based approach. Topics span biomedical sciences, including epigenetics, pharmacology, and clinical trials; health sciences, covering planetary health, politics, policy, and law; and social sciences, examining migration and its health impacts. Students will develop an interdisciplinary understanding of how these factors interrelate to influence individual and population health.

## **International**

The module takes a global perspective on the interactions between environment, genes, and health. Students will investigate the health challenges associated with large-scale migration, the global impact of environmental changes and extreme events, and the role of water, sanitation, and hygiene (WASH) in global health. Case-based learning and group discussions encourage students to consider these issues from local to global contexts, preparing them to address health challenges in an interconnected world.

## **Subject specific skills**

Knowledge and understanding of the key concepts, principles and theories, which will support a multidisciplinary approach to understanding environmental associations with health

Knowledge of the steps required for approval of interventions and ability to recognise the factors that can impact the effectiveness of an intervention as well as uptake of an intervention by the public

Ability to identify environmental factors that play a significant role in determining individual and population level health as well as the ability to investigate the interactions between environmental factors and health in its broadest term

## **Transferable skills**

Critical thinking, Self-directed learning, evidence-based approach to problem solving, time management, integration of information, group learning

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## **Study**

## Study time

Type	Required
Lectures	38 sessions of 1 hour (13%)
Seminars	25 sessions of 1 hour (8%)
Online learning (scheduled sessions)	20 sessions of 1 hour (7%)
Private study	87 hours (29%)
Assessment	130 hours (43%)
Total	300 hours

## Private study description

Students would be expected to engage in 87 hours of self-directed learning outside other learning and teaching activities outlined above.

## Costs

No further costs have been identified for this module.

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## Assessment

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

### Assessment group D1

	Weighting	Study time	Eligible for self-certification
Synoptic coursework: exploration of a cross-module case study with accompanying concept map	40%	60 hours	No
Students will explore a patient or population case that brings in elements from all of the shared-assessment modules in this year, this will be accompanied by a concept map and narrative that will be used to explain the relationship between factors and topics covered in the case exploration			
Interactions Multiple Choice Question/Short Answer Question examination	60%	70 hours	No
Total of 100 marks: 25 MCQ single best answer questions at 1 mark each, 75 marks from SAQs			

## Feedback on assessment

The coursework will be marked using standardised rubrics, which will provide feedback to the students (including individualised feedback) in line with WMS assessment criteria (including submission to Plagiarism software). Further verbal feedback will be available to students on request. Every student who fails an element will be offered an appointment for face to face feedback.

[Past exam papers for MD2B4](#)

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## Availability

## Courses

This module is Core for:

- UMDA-B990 Undergraduate Health and Medical Sciences
  - Year 2 of B990 Health and Medical Sciences
  - Year 2 of B990 Health and Medical Sciences
  - Year 2 of B990 Health and Medical Sciences