

LF315-15 Virology and Immunology

23/24

Department

Life Sciences

Level

Undergraduate Level 3

Module leader

Philip Young

Credit value

15

Module duration

10 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

The SARS CoV2 pandemic has enhanced the need for true molecular understanding of both viral life cycles, viral immune responses, how viruses evade these responses, and ultimately how we can apply cutting edge techniques to develop therapeutic strategies to prevent current and future pandemics. This module builds on the sound immunological and viral understanding provided in LF264 (Immunology) and LF213 (Virology) to produce a case-based module that focuses on 5 specific viruses: HIV, Ebola, SARS CoV2, Herpes Simplex Virus and Hepatitis C.

Module aims

1. Understand the molecular basis of viral replication
2. Understand antiviral immune responses
3. Understand the molecular basis of viral evasion strategies
4. Understand the molecular targets for anti-viral therapies
5. Understand the mechanisms of vaccine development
6. Understand the epidemiology of viral pandemics and public health control mechanisms

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.

Case Study 1: HIV

Lecture 1: Molecular Understanding of the HIV

Lecture 2: Normal anti-viral immune response and how HIV evades the T-cell response

Lecture 3: Anti-retroviral therapies

Workshop 1: How HIV is aiding the re-emergences of TB

Case Study 2: Ebola

Lecture 4: Molecular Understanding of the Ebola

Lecture 5: Importance of IgM in early viral responses and why "cytokine storms" arise

Lecture 6: Zmapp, Zmapp and vVSV-ZEBOV

Workshop 2: Ethical implications of "in-field" trials

Case Study 3: SARS CoV2

Lecture 7: Molecular Understanding of SARS CoV2

Lecture 8: Impact of age on anti-viral immune responses

Lecture 9: The new norm? Advent of RNA vaccines

Workshop 3: Modelling the pandemic- the importance of SAGE in public health policy

Case Study 4: Herpes Simplex Virus

Lecture 10: Molecular Understanding of HSV

Lecture 11: Neuroimmunology

Lecture 12: Reactivating the CNS immune response using light and sound

Workshop: Pharmacodynamics and pharmacokinetics: targeting across the blood brain barrier

Case Study 5: Hepatitis C Virus

Lecture 13: Molecular Understanding of HepC

Lecture 14: The cellular mediate response and the implications of chronic responses

Lecture 15: Hepatitis C and cancer

Lecture 16: Revision lecture

Learning outcomes

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

- 1. Understand the molecular basis of viral replication
- 2. Understand antiviral immune responses
- 3. Understand the molecular basis of viral evasion strategies
- 4. Understand the molecular targets for anti-viral therapies
- 5. Understand the mechanisms of vaccine development
- 6. Understand the epidemiology of viral pandemics and public health control mechanisms

Subject specific skills

1. Understand the molecular basis of viral replication

2. Understand antiviral immune responses
3. Understand the molecular basis of viral evasion strategies
4. Understand the molecular targets for anti-viral therapies
5. Understand the mechanisms of vaccine development
6. Understand the epidemiology of viral pandemics and public health control mechanisms

Transferable skills

1. Scientific writing
 2. Critical review of primary scientific research
 3. Lateral thinking
 4. Professionalism
 5. Information literacy
 6. Digital literacy
 7. Teamwork
 8. Problem Solving
 9. Communication
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Study

Study time

Type	Required
Lectures	16 sessions of 1 hour (11%)
Seminars	4 sessions of 1 hour (3%)
Private study	130 hours (87%)
Total	150 hours

Private study description

Background reading, independent research, revision for final assessment and preparation for seminar sessions

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 A

	Weighting	Study time
Openbook Assessment	100%	20 hours
4 essays released, students need to complete 2. Essays will be 1500 words and need to be fully researched and contain data from primary research sources		

Feedback on assessment

individual written feedback

Availability

Courses

This module is Optional for:

- Year 3 of UBSA-C700 Undergraduate Biochemistry
- ULFA-C1A2 Undergraduate Biochemistry (MBio)
 - Year 3 of C1A2 Biochemistry
 - Year 3 of C700 Biochemistry
- Year 4 of ULFA-C702 Undergraduate Biochemistry (with Placement Year)
- Year 3 of ULFA-C1A6 Undergraduate Biochemistry with Industrial Placement (MBio)
- UBSA-3 Undergraduate Biological Sciences
 - Year 3 of C100 Biological Sciences
 - Year 3 of C100 Biological Sciences
- Year 3 of ULFA-C1A1 Undergraduate Biological Sciences (MBio)
- Year 4 of ULFA-C113 Undergraduate Biological Sciences (with Placement Year)
- Year 3 of ULFA-C1A5 Undergraduate Biological Sciences with Industrial Placement (MBio)
- UBSA-C1B9 Undergraduate Biomedical Science
 - Year 3 of C1B9 Biomedical Science
 - Year 3 of C1B9 Biomedical Science
 - Year 3 of C1B9 Biomedical Science
- ULFA-C1A3 Undergraduate Biomedical Science (MBio)
 - Year 3 of C1A3 Biomedical Science
 - Year 3 of C1B9 Biomedical Science
- Year 3 of ULFA-C1A7 Undergraduate Biomedical Science with Industrial Placement (MBio)
- ULFA-CB18 Undergraduate Biomedical Science with Placement Year
 - Year 4 of CB18 Biomedical Science with Placement Year
 - Year 4 of CB18 Biomedical Science with Placement Year
 - Year 4 of CB18 Biomedical Science with Placement Year
- Year 3 of ULFA-B140 Undergraduate Neuroscience (BSc)
- Year 3 of ULFA-B142 Undergraduate Neuroscience (MBio)

- Year 3 of ULFA-B143 Undergraduate Neuroscience (with Industrial Placement) (MBio)
- Year 4 of ULFA-B141 Undergraduate Neuroscience (with Placement Year) (BSc)