

# CH408-15 Advanced Medicinal and Biological Chemistry

**22/23**

**Department**

Chemistry

**Level**

Undergraduate Level 4

**Module leader**

Manuela Tosin

**Credit value**

15

**Module duration**

10 weeks

**Assessment**

20% coursework, 80% exam

**Study location**

University of Warwick main campus, Coventry

---

## Description

### Introductory description

N/A

[Module web page](#)

### Module aims

The module is designed to develop student's awareness of current problems and directions at the forefront of medicinal chemistry. They will critically evaluate selected current research in medicinal chemistry. The module is designed to encourage students to be original in the application of their knowledge to the solution of research-based problems.

A range of teaching methods will be employed; including directed reading, workshops/problem classes, set exercises and student presentations. Students will be expected to undertake a significant amount of independent study around the subject, which will be directed appropriately through 10 contact hours with the whole class.

An office hour will be available once a week for students who require additional guidance with directed reading and student-centred learning, to discuss their problems with the module leader as

individuals or in groups.

Some or all of the following fields will be covered in the module, depending on availability of module tutors and the significance of recent advances in the respective fields of research. Molecular mechanisms of action of drugs targeting the ribosomal machinery, microtubules, cholesterol biosynthesis, fatty acid biosynthesis and other medically relevant targets; principles and methods of drug discovery; clinically-used drugs.

Students will demonstrate their achievement of the learning outcomes by critical evaluation of recently published research from the above fields. This will be assessed by coursework involving a verbal presentation, and a written examination designed to test their ability to apply knowledge to original problems

## **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.

Antibiotic classes and their targets

Anticancer agents and their targets

Cholesterol biosynthesis and its inhibitors

Fatty acid biosynthesis and its inhibitors

Anti-inflammatory agents and their targets

Antiviral agents and their targets

These classes will involve introductory lecture/seminars, and problem classes (workshops). An additional contact hour a week during one term, will be set aside (as bookable) so that students who have concerns with directed reading and student centred learning can discuss their problems with an academic on a one to one or group basis.

## **Learning outcomes**

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

- Demonstrate awareness and understanding of current research in the areas of medicinal chemistry outlined above.
- Critically evaluate recent research work in any of the fields of study described above, in light of their knowledge of organic, mechanistic and medicinal chemistry.
- Clearly and concisely communicate the results of their evaluation both verbally and in writing. Respond to verbal questions concerning the results of their evaluation.
- Apply their knowledge of organic, mechanistic and medicinal chemistry to solve original problems from the areas of study.
- Use appropriate information technology tools to prepare presentation aids.

## **Indicative reading list**

As this module is research-led it will make use predominantly of recently published research articles. Recommended texts are, therefore, likely to vary from year to year.

However, essential texts for directed reading are currently:

Walsh, "Antibiotics: Actions, Origins, Resistance"

Istvan et al., 'Structural mechanism for statin inhibition of HMG-CoA reductase', Science 2001, 92, 1160-1163.

Wright et al., 'Antibacterial targets in fatty acid biosynthesis', Curr Opin Microbiol. 2007, 10, 447-453.

Jordan et al., 'Microtubules as a target for anticancer drugs', Nat. Rev. Cancer 2004, 4, 253-265.

Text for revision/background reading:

McMurray and Begley, "The organic chemistry of biological pathways"

## Interdisciplinary

e.g. co taught with another department or with an industry perspective, bridges two or more disciplinary concepts, ideas, etc.)

## Subject specific skills

Problem solving

Critical thinking

## Transferable skills

Problem solving

Critical thinking

---

## Study

### Study time

Type	Required
Lectures	12 sessions of 1 hour (8%)
Seminars	4 sessions of 1 hour (3%)
Other activity	12 hours (8%)
Private study	122 hours (81%)
Total	150 hours

### Private study description

Self study and revision 102h.  
Preparation for presentation 20h.

### **Other activity description**

Attending all presentations, 12h (depends on class size).  
Office hours (10h total) optional.

### **Costs**

No further costs have been identified for this module.

---

### **Assessment**

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

Students can register for this module without taking any assessment.

### **Assessment group D3**

	<b>Weighting</b>	<b>Study time</b>
Presentation	20%	
Your talk should be no longer than 10 min. MAX INCLUDING QUESTIONS. You should prepare a Powerpoint presentation with NO MORE than 5 slides.		
In-person Examination	80%	
<ul style="list-style-type: none"><li>• Students may use a calculator</li><li>• Graph paper</li><li>• Answerbook Pink (12 page)</li><li>• Periodic Tables</li></ul>		

### **Feedback on assessment**

Feedback comments and grade on assessed work (oral presentation) provided on copy of marksheet. Cohort level examination feedback provided via Moodle.

[Past exam papers for CH408](#)

---

### **Availability**

### **Pre-requisites**

To take this module, you must have passed:

- Any of
  - [CH3E9-15 Advanced Organic Chemistry and Laboratory](#)
  - [CH3F3-30 Advanced Chemistry \(Organic, Inorganic and Physical\)](#)

## Courses

This module is Core for:

- Year 4 of UCHA-F110 Undergraduate Master of Chemistry (with Industrial Placement)
- Year 4 of UCHA-F109 Undergraduate Master of Chemistry (with International Placement)
- UCHA-4M Undergraduate Master of Chemistry Variants
  - Year 4 of F126 MChem Chemistry with Med Chem (with Prof Exp)
  - Year 4 of F125 MChem Chemistry with Medicinal Chemistry
- Year 5 of UCHA-F127 Undergraduate Master of Chemistry with Medicinal Chemistry (with Intercalated Year)

This module is Optional for:

- Year 1 of TCHA-F1PB MSc in Chemistry with Scientific Writing
- Year 1 of TCHA-F1PE Postgraduate Taught Scientific Research and Communication
- Year 4 of UCHA-F110 Undergraduate Master of Chemistry (with Industrial Placement)
- Year 5 of UCHA-F107 Undergraduate Master of Chemistry (with Intercalated Year)
- Year 4 of UCHA-F109 Undergraduate Master of Chemistry (with International Placement)
- UCHA-4M Undergraduate Master of Chemistry Variants
  - Year 4 of F105 Chemistry
  - Year 4 of F110 MChem Chemistry (with Industrial Placement)
  - Year 4 of F109 MChem Chemistry (with International Placement)
  - Year 4 of F106 MChem Chemistry with Professional Experience