

Liverpool John Moores University

Title: CHEMOTHERAPY AND APPLIED BIOTECHNOLOGY
Status: Definitive
Code: **6001MCPHAR** (113329)
Version Start Date: 01-08-2020

Owning School/Faculty: Pharmacy & Biomolecular Sciences
Teaching School/Faculty: Pharmacy & Biomolecular Sciences

Team	Leader
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Academic Level: FHEQ6 **Credit Value:** 24 **Total Delivered Hours:** 93
Total Learning Hours: 240 **Private Study:** 147

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	40
Online	25
Practical	12
Workshop	13

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination: 70% MCQ & Essay-type questions - 1 x 3hr	70	3
Report	AS2	Practicals and other coursework assessments	15	
Presentation	AS3	Poster presentation	15	

Aims

To present and illustrate the important principles relating to chemotherapeutics at the molecular level.

To review neoplastic diseases, AIDS, malaria, fungal and selected bacterial diseases and their treatment (prophylactic and therapeutic) by drugs.

To develop problem solving and descriptive skills as they apply to chemotherapy and applied biotechnology.

To understand the life cycle of given infections states (especially HIV, Malaria) , the advantages and disadvantages of medicines in current use and to gain an understanding of the biochemical basis of drug action.

To understand strategies used for the treatment of resistance and the role of pharmaceutical biotechnology in therapeutics.

Learning Outcomes

After completing the module the student should be able to:

- 1 Understand that a knowledge of the replicative cycle of selected diseases offers rational drug targets for chemotherapeutic intervention.
- 2 Recall the diseases and syndromes associated with bacterial infections, viral infections, fungal and protozoal infections.
- 3 Recall and discuss the mode of action and use of drugs used in the treatment of bacterial, fungal and protozoal infections.
- 4 Assess the pharmaceutical implications of antimicrobial chemotherapy including the development of resistance to drugs used in antimicrobial chemotherapy from a clinical perspective.
- 5 Discuss the rationale of therapy and prophylaxis of antimicrobial diseases, and describe the side effects caused by drugs in such treatment.
- 6 Differentiate between normal and neoplastic cells and summarize the trends in cancer incidence and mortality.
- 7 Recall and discuss the rationale for the use of drugs in cancer treatment and its relationship to other forms of therapy.
- 8 Demonstrate knowledge of the relationship between structure and mechanism in respect of the activation, therapeutic action, metabolism and development of resistance for a selection of anti-tumour drugs.
- 9 Recall and discuss the rationale and clinical features of adverse drug reactions to cytotoxic drugs and the available pharmacological counter treatments.
- 10 Critically review the causes and treatments by drugs of microbial and neoplastic diseases.
- 11 Understand the role of pharmaceutical biotechnology in therapeutics.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

EXAM	1	2	3	4	5	6	7	8	9	10	11
Report	1	2									
Poster	1	2									

Outline Syllabus

Antibiotics: classification, development, structure, antimicrobial spectra of activity, mode of action, sensitivity tests, selectivity, metabolism, adverse effects, mechanisms of resistance development. Antibiotic policies. Bacterial diseases of man and clinical uses of antibiotics.

Antivirals: structure, mode of action, selectivity, metabolism, adverse effects, mechanisms of resistance development. Viral diseases in man and clinical uses of antivirals. Understand the replicative cycle of viruses and retroviruses including HIV.

Antifungals and antimalarials: mode of action, selectivity, metabolism, adverse effects, and resistance development. Fungal and protozoal diseases of man and clinical uses of antifungals and antiprotozoals.

Biochemistry and structure of bacteria, viruses, fungi and protozoa relevant to mode of action of antimicrobial drugs.

Cancer incidence, survival and mortality statistics. Characteristics of neoplastic cells.

The principles of cancer chemotherapy. Antineoplastic drugs: structure, activation, and modes of action, selectivity, metabolism, clinical uses, adverse effects, mechanisms of resistance development.

Pharmaceutical biotechnology, History, classification and mode of action of biopharmaceuticals. Production of recombinant proteins, antibodies and oligonucleotide products. Formulation and quality control of biopharmaceutical products.

Learning Activities

In addition to lectures, students will experience workshops and practicals. The latter activities will focus upon generation and/or interpretation of data, as well as solution of relevant problems. The production of a poster and critical review of current medicines for drugs in current use will be conducted in randomised groups. A poster presentation will be made to both staff and students illustrating the results.

Notes

The pathology and drug treatment of malignant tumours and microbial infections will be discussed. The biochemical basis of drug action, selectivity and other aspects of drug treatment will be discussed for named diseases and syndromes.