

Principles of Drug Discovery

Module Code:	INC7014-B
Academic Year:	2018-19
Credit Rating:	20
School:	School of Pharmacy and Medical Sciences
Subject Area:	Cancer Therapeutics
FHEQ Level:	FHEQ Level 7 (Masters)

Pre-requisites:

Co-requisites:

Contact Hours

Type	Hours
Lectures	24
Tutorials	5
Directed Study	171

Availability Periods

Occurrence	Location/Period
BDA	University of Bradford / Semester 1 (Sep - Jan)

Module Aims

To provide students with an appreciation and understanding of the various stages of the drug discovery process. To provide students with a current and critical evaluation of methods, techniques and strategies used to select molecules for evaluation of their biological properties. In particular, a specific aim is to provide students with an understanding of the criteria used for 'druggable' targets.

Outline Syllabus

The aim of this course is to provide an overview of all aspects of the drug discovery process and an introduction to drug discovery. Topics include:

Targets

What makes a good drug target, strategies for identification of new targets, target validation

Receptors & Enzymes

A brief introduction/revision to receptor types, enzyme inhibition

Natural products

A source for potential lead agents. Discovery/sourcing of natural products. Drug development from natural product leads

Drug Design & Molecule Structure-Activity

This topic will explore in some detail the molecular structure & physicochemical properties of drug molecules (pKa, ionization, water solubility, stereochemistry), & how they interact with their targets

Computational chemistry

An overview of methods to generate hit compounds using molecular modelling, virtual libraries. Includes a workshop demonstration.

Peptides, proteins, modern biological therapies:

Unique issues to such molecules, drug delivery, synthesis, therapeutic examples. Cancer immunotherapy and antibody-conjugates.

Drug screening

Methods for in vitro & in vivo screening of agents

Lead optimisation strategies

Combinatorial approaches, diversity-orientated synthesis

Pharmacokinetics and Drug Metabolism:

Half-life, clearance, elimination, importance of administration route. Drug metabolism reaction types, Cytochrome P450, Glucuronidation.

Safety Pharmacology

Pre-clinical assessment of potential clinical agents

Pre-clinical evaluation and clinical trials

Stages of clinical trial, examples

Intellectual property, commercialisation and regulation:

Patents, confidentiality; issues related to large scale production, formulation, marketing, regulatory affairs

Module Learning Outcomes

On successful completion of this module, students will be able to...

- 1 Appraise the drug discovery process; in particular, strategies and tools for identification and optimisation of leads; types of drug delivery approaches; importance, strategies and tools for PKPD profiling and other pre-clinical issues, clinical trials, issues related to large scale drug production, intellectual property issues and regulatory affairs.
- 2 Critically evaluate issues that are relevant in a drug discovery process.

- 3 Employ generic literature skills for life-long learning (literature and databases).
- 4 Critically evaluate issues and literature material and deliver an oral presentation. Development of communication skills.

Learning, Teaching and Assessment Strategy

A combination of lectures, workshops, and student directed learning will develop themes in each subject area. Workshops will enable specific subject matter to be explored in depth, with assessment through short written assignments. Overall understanding of the drug discovery process will be assessed through an oral presentation and subsequent questioning.

Mode of Assessment

Type	Method	Description	Length	Weighting	Final Assess'
Summative	Presentation	Oral Presentation (drug profile)	20 minutes	14%	No
Summative	Examination - closed book	Students must answer five out of seven questions	3 hours	70%	Yes
Summative	Coursework	Coursework 1: Medicinal Chemistry		8%	No
Summative	Coursework	Coursework 2: Pre-clinical proof of concept		8%	No

Legacy Code (if applicable)

CR-4016D

Reading List

To view Reading List, please go to [rebus:list](#).