

Module Details	
Module Title	Principles of Drug Discovery
Module Code	INC7014-B
Academic Year	2020/1
Credits	20
School	School of Pharmacy and Medical Sciences
Subject Area	Cancer Therapeutics
FHEQ Level	FHEQ Level 7
Pre-requisites	N/A
Co-requisites	N/A

Contact Hours	
Type	Hours
Tutorials	5
Lectures	24
Directed Study	171

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 2

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

Learning Outcomes

Outcome Number	Description
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

N/A

Mode of Assessment

Type	Method	Description	Length	Weighting
Summative	Examination - Open Book	Online assessment via Canvas (Students must answer five out of seven questions)	3 hour	70%
Summative	Presentation	Oral Presentation (drug profile)	20 mins	14%
Summative	Coursework	Coursework 1: Medicinal Chemistry	N/A	8%
Summative	Coursework	Coursework 2: Pre-clinical proof of concept	N/A	8%

Reading List

To access the reading list for this module, please visit <https://bradford.rl.talis.com/index.html>

Please note:

This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.

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