UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title	Principles of drug discovery
Module Code	INC7020-C
Academic Year	2024/5
Credits	30
School	School of Pharmacy and Medical Sciences
FHEQ Level	FHEQ Level 7

Contact Hours	
Type	Hours
Tutorials	5
Lectures	24
Directed Study	200

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 1
BDA	University of Bradford / Semester 3

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
01	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.
02	Critically evaluate issues that are relevant in a drug discovery process.
03	Employ generic literature skills for life-long learning (literature and databases).
04	Critically evaluate issues and literature material and deliver an oral presentation. Development of communication skills.

Learning, Teaching and Assessment Strategy

The course takes the form of lectures and workshops. A team with expertise in the various aspects of the drug discovery process has been assembled to deliver the lectures: from within the Institute, the wider university and beyond. We are particularly fortunate to benefit from the expertise of Prof Colin Fishwick from the University of Leeds ? an international expert in computational chemistry. Lectures are intended to be informal and a chance to explore concepts with the academic leading the class ? interaction and questioning is highly encouraged. Individual lecturers will suggest further reading to facilitate understanding beyond the formal taught component. However, students should take ownership of their learning and are encouraged to source their own additional material to supplement the lectures.

Workshops will enable further exploration of key topics through discussion and assignments. The module is assessed by both formal examination and through participation in the Workshop sessions, details of which can be found in this handbook. In addition, students will study in detail he drug discovery process of one drug in clinical use (or advanced clinical trials) and deliver their findings via an oral presentation to the group ? a key skill for anyone pursuing a scientific career.

Mode of Assessment

Type	Method	Description	Weighting
Summative	Examination - Closed Book	Examination closed book (Students must answer five out of seven questions) (3 Hrs)	70%
Summative	Presentation	Oral presentation (drug profile)	30%

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.
