Fundamentals of Drug Discovery

Module Code: INC6001-B
Academic Year: 2016-17
Credit Rating: 20
School: Institute of Cancer Therapeutics
Subject Area: Cancer Therapeutics
FHEQ Level: FHEQ Level 6
Module Coordinator: Dr Robert Falconer

Additional Tutors:
Dr Kevin Adams, Prof Colin Fishwick, Professor Paul Loadman, Prof Laurence Patterson, Dr Klaus Pors,
Dr Helen Sheldrake, Dr Therese Sheehan, Dr Maria-Victoria Vinader, Dr Kamyar Afarinkia, Prof Richard
Morgan, Dr Christopher Sutton, Prof Mohamed El-Tanani

Pre-requisites:
Co-requisites:

Contact Hours

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Lectures</td>
<td>24</td>
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<tr>
<td>Tutorials</td>
<td>5</td>
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<tr>
<td>Directed Study</td>
<td>169</td>
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<td>Examinations DO</td>
<td>2</td>
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Availability Periods

<table>
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<th>Occurrence</th>
<th>Location/Period</th>
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<tbody>
<tr>
<td>BDA</td>
<td>University of Bradford / Semester 1 (Sep - Jan)</td>
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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 'drugable' targets.
Outline Syllabus

The aim of this module is to provide an overview of all aspects of the drug discovery process and an introduction to drug discovery. The topics to be covered include:

Receptors & Enzymes: A brief introduction/revision to receptor types, enzyme inhibition.

Natural products: A source of 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), and how they interact with their targets.

Computational chemistry: An overview of methods to generate hit compounds using molecular modelling, virtual libraries.


Lead optimisation strategies: Combinatorial approaches, diversity-oriented synthesis;

Pharmacokinetics: 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 trials, examples.

Intellectual property, commerciality and regulation: Patents, confidentiality, examples.

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. Describe the drug discovery process: relate strategies and tools for identification and optimisation of leads; 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. Describe processes that are relevant in a drug discovery process.
3. Employ generic literature skills for life-long learning (literature and databases).

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

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<th>Type</th>
<th>Method</th>
<th>Description</th>
<th>Length</th>
<th>Weighting</th>
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<tbody>
<tr>
<td>Summative</td>
<td>Examination - closed book</td>
<td>FINAL ASSESSMENT: One two hour examination. Students must answer four out of seven questions</td>
<td>2 hours</td>
<td>70%</td>
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<tr>
<td>Summative</td>
<td>Coursework</td>
<td>Assessment through short written assignments in 2 tutorial sessions (7.5% each) &amp; oral presentation of drug profile (15%)</td>
<td>0 hours</td>
<td>30%</td>
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### Legacy Code (if applicable)

CR-3002D

### Reading List

To view Reading List, please go to rebus:list.