UNIVERSITY of BRADFORD

Module Descriptor

Molecular Mechanisms of Toxicity

Module Code:	INC7009-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	21
Tutorials	8
Laboratory	5
Directed Study	166

Availability Periods

Occurrence	Location/Period
BDA	University of Bradford / Semester 2 (Feb - May)

Module Aims

To develop a critical evaluative understanding of the molecular mechanism underlying cellular toxicity.

Emphasis is placed on emerging concepts that reflect the changing nature of modern drug development. The module will address the mechanisms responsible for drug target toxicity and the evolution of new preclinical strategies to identify and predict such mechanisms.

The module is structured as a combination of lectures, tutorials, student-led seminars and

laboratory investigation, plus student directed learning.

The student led seminars consist of the preparation and delivery of a drug profile presentation, where students indvidually review and present a selected drug profile with an emphasis on toxicity and in vitro screening methods as an alternative to in vivo toxicology. The laboratory investigation includes the preparation of a detailed experimental report covering methods, data collection and data analysis and interpretation.

The acquired knowledge will be assessed by coursework evaluation and examination at the end of the semester.

Outline Syllabus

This module will cover the molecular mechanisms underlying the potential toxicities of new drugs under development. Topics to be covered include chemical carcinogenesis, genotoxic and non-genotoxic mechanisms, receptor mediated toxicity including biological mimicry, direct and indirect toxicity, regenerative hyperplasia as a toxicological mechanism, molecular mechanisms of cell death and hyperproliferation, sex and species differences. The module will also cover methodology for identifying molecular mechanisms including toxicogenomics (incl. toxicant fingerprinting), toxicoproteomics (incl. global proteomic change and signalling pathway specific changes) and the importance of extrapolation of risk data from rodent studies to humans. An important area in safety pharmacology is the development of alternative strategies to preclinical in vivo studies for identifying drug toxicity and or predicting drug safety. As such this module will address alternatives to animal testing, the advent of non-invasive imaging for toxicology evaluation and predictive computational models (incl. in silico toxicity prediction). Students will also extend their literature searching and written communication skills through the preparation of a report on molecular mechanisms of toxicity and an oral communication on alternatives to animal testing through presentation of a seminar.

Module Learning Outcomes

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

1 Critically evaluate the mechanisms underlying toxicity in the context of drug development.

10 Develop a strategy to present a discussion of a research paper or research theme.

11 Develop generic literature skills for life-long learning (literature & databases).

2 Understand the different cellular mechanisms of toxicity and their relevance to drug development

3 Critically evaluate methods and techniques for predicting potential toxicities

4 Describe toxicological screening tools as alternatives to in vivo drug screening

5 Understand the requirements for regulatory body approval

6 Critically evaluate and interpret the molecular mechanisms underlying toxicity

7 Describe current and new methods for identifying drug toxicity and their underlying molecular basis

8 Understand methodology for identifying molecular mechanisms of toxicity and discuss strategies for predicting toxicity

9 Work as part of a team, interpret data, plan experimental work and work to deadlines

Learning, Teaching and Assessment Strategy

A combination of lectures, student-led seminars (drug profile), laboratory practical and student directed learning (written report).

Mode of Assessment

Type	Method	Description	Length	Weighting	Final Assess'
Summative	Examination - closed book	One 2-hour examination (two essays to be answered from a choice of five)	2 hours	50%	Yes
Summative	Coursework	One oral presentation of drug profile and alternative screening methodologies		25%	No
Summative	Coursework	A molecular mechanism of apoptosis written report		25%	No

Legacy Code (if applicable)

CR-4010D

Reading List

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