Liverpool John Moores University

Title:	DRUG DESIGN AND DISCOVERY
Status:	Definitive
Code:	**7001MCPHAR** (113112)
Version Start Date:	01-08-2012
Owning School/Faculty:	Pharmacy & Biomolecular Sciences
Teaching School/Faculty:	Pharmacy & Biomolecular Sciences

Team	Leader
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Academic Level:	FHEQ7	**Credit Value:**	10.00	**Total Delivered Hours:**	26.00
Total Learning Hours:	100	**Private Study:**	74		

Delivery Options
Course typically offered: Semester 1

Component	Contact Hours
Lecture	16.000
Seminar	8.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	100.0	2.00

Aims

To impart an understanding of modern approaches for selection and optimization of structures to rationally design compounds for therapeutic use.

Learning Outcomes

After completing the module the student should be able to:

1 comprehendthe molecular interaction of drug molecules with drug target sites in 3D (pharmacodynamics)
2 identify molecular features capable of modulating pharmacokinetic and pharmacodynamic properties and of enabling site directed drug delivery
3 outline methods for the identification, selestion and targeting of putative drug molecules
4 describe instances of ab initio rational design of drug structures
5 suggest processes and strategies for the optimization of drug structures, including nanoparticularisation
6 utilise the research literature and on-line data bases to obtain information about the development of specific drugs
7 outline strategies for the development of specified chemotherapeutic agents

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

EXAM	1	2	3	4	5	6	7

Outline Syllabus

The syllabus will be determined by current practice as represented published research literature. The material discussed will consequently vary to reflect recent developments and trends prominent in the drug discovery & design arena. Core material concerning drug discovery and structural design will normally be presented with variation in the examples cited as appropriate. Additional material may vary considerably depending on current research interest and expertise. Student presentation of material from the literature will form a significant component of the delivery. The following syllabus may be taken as representative:

This lecture course will begin with an overview of modern rational drug design and discovery process. Approaches to the discovery of drug leads for developing clinically useful & safe drugs. Combinatorial and fragment based drug design. Bioinformatics for rational drug design. Case history: Kinase Inhibitors. Molecular modelling and computational chemistry for the drug discovery and design. Use of advanced rational design techniques to optimise drug activity. Review of the current developments in microfluidic technology as applied to drug discovery and testing. Coverage will include rapid on-line screening technologies, liquid library generation and proteomic/genomic techniques. Development of new and novel antimicrobial drugs; drug resistance as a major driver in antimicrobial drug discovery; novel drug targets, mode of action studies and structure-activity relationships. A review of the strategies for production of nanoparticles polymers for targeted delivery of therapeutic agents Case history: Frontiers of gene delivery research for treatment of diseases).

Learning Activities

Lectures, evaluation workshops, literature searching.

References

Course Material	Book
Author	Patrick, G.L.
Publishing Year	2009
Title	An Introduction to Medicinal Chemistry
Subtitle	
Edition	4th
Publisher	OUP
ISBN	0199234477

Course Material	Book
Author	Wermuth, C.G.
Publishing Year	2008
Title	The Practice of Medicinal Chemistry
Subtitle	
Edition	3rd
Publisher	Elsevier
ISBN	0123741947

Course Material	Book
Author	Scientific journals as appropriate
Publishing Year	0
Title	
Subtitle	
Edition	
Publisher	
ISBN	

Notes

Current topics involving chemistry in the discovery and development of drugs will be presented and discussed. Introductory material will be delivered by lectures. Subsequent material will be presented by students-centred workshop sessions which will involve the use of research sources. Self assessment via programmed learning will be provided to determine student centred learning