

## MODULE DESCRIPTOR

### Module Title

Pharmacology for Drug Design

Reference	ASM042	Version	2
Created	August 2021	SCQF Level	SCQF 11
Approved	May 2019	SCQF Points	15
Amended	August 2021	ECTS Points	7.5

### Aims of Module

To develop the student's understanding of how chemical and biological sciences integrate to produce pharmacological effects, so as to enable them to critically discuss and evaluate the role of pharmacology in drug design and delivery.

### Learning Outcomes for Module

On completion of this module, students are expected to be able to:

- 1 Demonstrate a critical understanding of principle drug targets, drug interaction with targets and how drugs produce pharmacotherapeutic effects at a biochemical and physiological level (pharmacodynamics).
- 2 Critically discuss and appraise sources of pharmacological agents and the routes of administration which will optimise absorption, distribution, metabolism and excretion (ADME) of drugs (pharmacokinetics).
- 3 Demonstrate critical understanding and application of mathematical and graphical models used in the interpretation and representation of pharmacological data.

### Indicative Module Content

Pharmaceutical chemistry and biology. Pharmacodynamics: drug classifications - full/partial/inverse agonists and antagonists; drug targets - receptors, enzymes, channels and transporters; drug specificity and selectivity; mechanisms of drug action. Pharmacokinetics: drug administration - single dose, multiple dose, delivery route; absorption, distribution, metabolism and excretion (ADME); pharmacokinetic parameters - bioavailability (F), salt factor (S) volume of distribution (Vd), extraction ratio (E), absorption and elimination rate constants ( $K_a$  &  $K_e$ ), clearance (Cl); zero and first-order elimination. Quantitative analysis of pharmacodynamic and pharmacokinetic effects; drug target binding, blood drug concentration/ time relationship, pharmacokinetic formulae. Pharmacotherapeutics: drug efficacy; adverse drug reactions and interactions.

### Module Delivery

The module is delivered by lectures, tutorials, coursework and online learning activities.

Module Ref:

ASM042 v2

**Indicative Student Workload**

Contact Hours

Full Time

30

Part Time

N/A

Non-Contact Hours

120

N/A

Placement/Work-Based Learning Experience [Notional] Hours

N/A

N/A

TOTAL

150

N/A

*Actual Placement hours for professional, statutory or regulatory body***ASSESSMENT PLAN***If a major/minor model is used and box is ticked, % weightings below are indicative only.***Component 1**

Type:

Coursework

Weighting:

100%

Outcomes Assessed:

1, 2, 3

Description:

A critical review of literature pertaining to the pharmacodynamic, pharmacokinetic and pharmacotherapeutic profile of a given drug compound.

**MODULE PERFORMANCE DESCRIPTOR****Explanatory Text**

Component 1 (CW1) comprises 100% of the module grade. To pass the module, a minimum of a D grade is required. Non-submission of this component will result in an NS grade.

Module Grade

Minimum Requirements to achieve Module Grade:

**A**

A

**B**

B

**C**

C

**D**

D

**E**

E

**F**

F

**NS**

Non-submission of work by published deadline or non-attendance for examination

**Module Requirements**

Prerequisites for Module

None, in addition to course entry requirements.

Corequisites for module

None.

Precluded Modules

None.

**INDICATIVE BIBLIOGRAPHY**

- |   |  |
|---|--|
| 1 | Rang, H. P., Ritter, J. M., Flower, R. J., Henderson, G. (2016). 'Rang and Dale's Pharmacology', 8th edition, Elsevier.                |
| 2 | Kenakin, T. P. (2017). 'Pharmacology in drug discovery and development: understanding drug response', 2nd edition, Academic Press.     |
| 3 | Lofsson, T. (2015). Essential pharmacokinetics: a primer for pharmaceutical scientists', Elsevier Academic Press.                      |
| 4 | Talevi, A., Quiroga, P.A.M. (2018). 'ADME Processes in pharmaceutical sciences: dosage, design and pharmacotherapy success', Springer. |