DRUG DISCOVERY FOR A NEW AGE - 2024/5

Module code: BMSM026

Module Overview

In this module students will be presented with a number of industrially relevant therapy areas and drug targets and will work to develop a target product profile, which they will then present back to industrial experts in a bid for funding for the project.

Students will be expected to investigate and discuss:

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    - The expression and tissue distribution of the target.
    - Molecular mechanisms and signaling pathways relevant to the therapy area and molecular target.
    - Structure and function of target, and likely therapeutic solutions ranging from small molecule to antibody therapy. Suitable experimental models for evaluation of efficacy.
    - Suitable experimental models for evaluation of safety.
    - Preclinical development plans.
    - Clinical development through to possible market approval.
    - Appreciation of time scales and costings for the whole Drug Discovery and development process.

Module provider

School of Biosciences

Module Leader

TRINDER Sarah (Biosciences)

Number of Credits: 15

ECTS Credits: 7.5

Framework: FHEQ Level 7

Module cap (Maximum number of students): N/A

Overall student workload

Workshop Hours: 20

Independent Learning Hours: 83

Seminar Hours: 20

Practical/Performance Hours: 1

Guided Learning: 20

Captured Content: 6

Module Availability

Semester 1

Prerequisites / Co-requisites

N/A

Module content

Indicative content may include:

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- The expression and tissue distribution of the target.
- Molecular mechanisms and signaling pathways relevant to the therapy area and molecular target.
- Structure and function of target, and likely therapeutic solutions ranging from small molecule to antibody therapy.
- Suitable experimental models for evaluation of efficacy.
- Suitable experimental models for evaluation of safety.
- Preclinical development plans - target product profile
- Clinical development through to possible market approval.
- Appreciation of time scales and costings for the whole Drug Discovery and development process.

Assessment pattern

Assessment type	Unit of assessment	Weighting
Oral exam or presentation	Dragons den presentation	60
Coursework	Reflection and evaluation	20
Coursework	Assessment of individual contribution	20

Alternative Assessment

N/A

Assessment Strategy

The assessment strategy is designed to provide students with the opportunity to demonstrate:

Team based communication skills, professionalism, presentation skills, knowledge of their target and the drug discovery process.

Thus, the summative assessment for this module consists of:

- Comprehensive 1 hr (45 mins presentation & 15 mins questions) Dragons Den presentation of the target portfolio review (60%). Assesses learning outcomes 1, 2, 3, 4 & 5.
- Reflection and evaluation of group and individual performance, project progress and development and feedback from the presentations (20%). Assesses learning outcomes 1, 2 & 4.
- Assessment of the individual's performance and contribution to the project by academics (20%). Assesses learning outcomes 1, 2, 3, 4 & 5.

Formative assessment

In class feedback, discussion and online engagement with discussion boards and blended material. Students will be given the opportunity to have a practice run of their presentation with feedback provided immediately so they can feed-forward into the summative presentation.

Feedback

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Feedback on all summative assessments will be available. The group marks for the presentation will be released promptly to assist students with the writing of their reflection.

Module aims

- 1. Develop an appreciation for the industrial considerations of duration and expense involved in bringing a new therapy to market.
- 2. Apply the principles of pharmacology and physiology to the disease area and concepts of likely outcomes and overall effects
- 3. Identify experimental models and evaluate their suitability and limitations in the context of drug efficacy and safety
- 4. Development of professionalism and presentation skills in delivering a bid for funding.

Learning outcomes

		Attributes Developed
001	Critically describe and explain the processes and considerations in the identification, characterisation, development and testing of novel pharmaceutical compounds.	KC
002	Identify and explain the role of the identified target in the disease state chosen	KC
003	Describe and explain the pharmacological parameters and considerations relevant to their potential compound, using this to make hypotheses regarding efficacy and side effects.	KC
004	Critically compare and contrast the experimental models used in efficacy and safety testing.	KC
005	Present an industry quality application for funding to support a drug discovery project.	KCPT

Attributes Developed

C - Cognitive/analytical

K - Subject knowledge

T - Transferable skills

P - Professional/Practical skills

Methods of Teaching / Learning

The learning and teaching strategy is designed to:

Provide a flipped learning environment, where teams of students work with industrial colleagues and academic facilitators to cover a broad range of target-based data and drug parameters. Students will engage with a blended learning approach to facilitate communications with off-site experts and will initially work with provided materials and then enhance this with research of their own.

The learning and teaching methods include:

Flipped classroom workshops (tutorials) - in which the students will examine case studies of the different processes and consider how to apply them to their own process.

Group meetings – these will be held between the student group and industrial colleagues/academic facilitators. Students will be

encouraged to share their research and personal thoughts on the project.

Independent study – Students are expected to perform their own research as both individuals and in their groups. Groups should also arrange their own group meetings to discuss ideas and research found, not just rely on the group meetings with the industry experts and academics.

Indicated Lecture Hours (which may also include seminars, tutorials, workshops and other contact time) are approximate and may include in-class tests where one or more of these are an assessment on the module. In-class tests are scheduled/organised separately to taught content and will be published on to student personal timetables, where they apply to taken modules, as soon as they are finalised by central administration. This will usually be after the initial publication of the teaching timetable for the relevant semester.

Reading list

https://readinglists.surrey.ac.uk
Upon accessing the reading list, please search for the module using the module code: BMSM026

Other information

Resourcefulness & resilience

Students are required to work in a team to create a target product profile (TPP). They work with industry experts who offer guidance. The TPP is presented to a 'Dragons' Den' of industry experts who decide who they wish to 'invest' in. Students are also required to produce a self-reflection considering themselves and their team.

Critical appraisal of the literature is key.

Global & cultural capabilities

The target condition should be that where there is a current unmet clinical need.

Students will be working in groups and will be encouraged to bring their own opinions and views. They will be working with industry experts and academics in an inclusive and encouraging environment.

Sustainability

Students should consider the sustainability of their proposal and the Drug Discovery Industry as a whole, and how it could be improved. In line with One Health approach the module works towards relevant Sustainable Development Goals (SDGs) like SDG3 (health).

Reducing cost of disease burden across the life course by understanding molecular and cellular pharmacological processes in health and disease, leading to interventions to promote health and prevent or treat disease. Consider the requirement, appropriateness and reliability of animal models of disease.

Digital capabilities

This module requires a high level of research which will include the use of various online databases. In a group students’ produce a 45 min presentation. Use of zoom, panopto, various software to produce an engaging presentation.

Employability

Students are engaging with people from industry, performing a 'real-world' task for the Drug Discovery Industry/academic world. The module will enhance employability through knowledge of subject area, problem solving and critical analysis skills - key to employment and success in the professional workplace.

Programmes this module appears in

Programme	Semester	Classification	Qualifying conditions
Biochemistry MSci (Hons)	1	Compulsory	A weighted aggregate mark of 50% is required to pass the module