



MODULE SPECIFICATION

Part 1: Information			
Module Title	Molecular Medicine		
Module Code	USSKCG-15-3	Level	Level 6
For implementation from	2020-21		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Health & Applied Sciences	Field	Applied Sciences
Department	HAS Dept of Applied Sciences		
Module type:	Standard		
Pre-requisites	Genes and Biotechnology 2020-21		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
<p>Overview: Pre-requisites: Students must take Molecular Biotechnology (USSKAM-30-2) OR Genetics (USSKFQ-15-2).</p> <p>Globally, societies are presented with numerous medical challenges in understanding the causes of, diagnosing and treating existing and newly emerging diseases. Clearly there are numerous difficult problems which require effective solutions, many of which are provided by the application of biotechnology. The last 60 years has seen a truly astonishing growth in our understanding of the science that underpins biological processes. The discovery of DNA and more importantly an understanding of how to manipulate gene expression in bacteria and higher organisms have provided the basis for a medical biotechnology revolution that now impinges on all walks of life. This module in “Molecular Medicine” will introduce you to up to date biotechnological approaches and solutions that endeavour to overcome many of the medical issues faced by societies across the world.</p> <p>Educational Aims: See Learning Outcomes</p> <p>Outline Syllabus: In this module you will examine the use of heterologous gene expression systems which use organisms including bacteria, yeast, plants, cell cultures and higher animals both for the study of gene function and the study of potential disease treatments and for the production of medically important pharmaceuticals and replacement transplantation organs in an</p>

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industrial setting. You will learn about a range of modern molecular analytical and diagnostic approaches for the determination of the causes and progression of diseases and subsequently examine gene therapy approaches which employ gene editing and cell targeted viral transformation systems for the treatment of inherited genetic disorders. You will examine the ethical use of bio-prospecting technologies and the molecular techniques employed along with the associated phylogenetic approaches for the discovery of novel therapeutic molecules and the use of targeted protein engineering technologies which aim to alter and optimise protein function and facilitate the design of novel drugs. Finally, you will examine the use of bio-sensing technologies and the use of recombinant protein technologies therein for both the detection of diseases and monitoring treatment efficacy.

Ultimately, you should be able to understand the molecular biotechnological research, clinical and industrial scale up phases which result in the synthesis of treatments for a wide range of medical diseases and how the ability of the processes employed to treat those diseases is monitored and evaluated.

Teaching and Learning Methods: Core graduate skills will be evidenced in this L3 module. Written and oral communication skills and dissemination of critically analysed learned material in a professional manner to an audience will be assessed both in the coursework and case study presentation. The written and presented case study will give students the opportunity to evidence their ability to use digital machinery and to be innovative, forward looking and global in their perspective while presenting themselves in an emotionally intelligent manner.

For 2020-21 all of the taught material will move online as a result of covid 19

Part 3: Assessment

Summative assessment for this module will be provided using a number of approaches. The nature of the programme to which this level 3 module contributes requires a measure of their acquisition of oral presentation skills of critically discussed and analysed data and information obtained from researching the literature.

The ability of the students to write scientifically, independently research the literature and analyse published data will be assessed under component B in the form of a 2000 word case study report that incorporates the use of and extends upon the majority of the taught material within the module. Students will be given a choice of a range of appropriate topics to research in depth beyond the lecture material and to critically present this in a structured format such that they can demonstrate a clear understanding and application of the majority of the material within the module. Final summative assessment under component A1 will take the form of a 25 min short online oral presentation including questioned examination (15 min. presentation, 10 min. questions) of the case study in component B and will be designed to test the ability of the students to present and critically discuss the range of topics in the module within a wider context and to highlight, thinking, further interest and independent research and reading beyond the taught material. Presentations will be marked with emphasis on both the ability of students to present orally and to demonstrate a clear knowledge and understanding of the application of the material taught within the module.

First Sit Components	Final Assessment	Element weighting	Description
Presentation - Component A	✓	60 %	Online Oral Presentation/ Question-Answer Session (25 mins)
Case Study - Component B		40 %	Extended case study (2000 words)
Resit Components	Final Assessment	Element weighting	Description
Presentation - Component A	✓	60 %	Online Oral Presentation/ Question-Answer Session (25 mins)
Case Study - Component B		40 %	Extended case study (2000 words)

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Part 4: Teaching and Learning Methods																	
Learning Outcomes	<p>On successful completion of this module students will achieve the following learning outcomes:</p> <table border="1"> <thead> <tr> <th style="text-align: left;">Module Learning Outcomes</th> <th style="text-align: left;">Reference</th> </tr> </thead> <tbody> <tr> <td>Review the scientific literature relevant to the biotechnology that underpins molecular medicine and demonstrate an written understanding of the fundamentals of this subject area</td> <td>MO1</td> </tr> <tr> <td>Critically appraise the potential of the biotechnology sector to provide solutions in medical research, disease diagnosis, prevention, and therapy and in deriving commercial medically useful products</td> <td>MO2</td> </tr> <tr> <td>Discuss the molecular techniques associated with the generation of transgenic microbes and higher organisms and their applications in the medical field</td> <td>MO3</td> </tr> <tr> <td>Discuss the application of biotechnology within a biodiversity setting and understand how this may lead to the discovery of novel treatments for diseases</td> <td>MO4</td> </tr> <tr> <td>Discuss the use of bio-sensing technologies within a medical context and critically evaluate the techniques employed</td> <td>MO5</td> </tr> <tr> <td>Orally present a comprehensive understanding of the subject area contained within the module and answer relevant in depth questions.</td> <td>MO6</td> </tr> </tbody> </table>	Module Learning Outcomes	Reference	Review the scientific literature relevant to the biotechnology that underpins molecular medicine and demonstrate an written understanding of the fundamentals of this subject area	MO1	Critically appraise the potential of the biotechnology sector to provide solutions in medical research, disease diagnosis, prevention, and therapy and in deriving commercial medically useful products	MO2	Discuss the molecular techniques associated with the generation of transgenic microbes and higher organisms and their applications in the medical field	MO3	Discuss the application of biotechnology within a biodiversity setting and understand how this may lead to the discovery of novel treatments for diseases	MO4	Discuss the use of bio-sensing technologies within a medical context and critically evaluate the techniques employed	MO5	Orally present a comprehensive understanding of the subject area contained within the module and answer relevant in depth questions.	MO6		
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Reading List	<p><i>The reading list for this module can be accessed via the following link:</i></p> <p>https://uwe.rl.talis.com/modules/usskcg-15-3.html</p>																

Part 5: Contributes Towards
<p>This module contributes towards the following programmes of study:</p> <p>Biological Sciences [Sep][FT][Frenchay][3yrs] BSc (Hons) 2018-19</p> <p>Biological Sciences [Sep][FT][Frenchay][4yrs] MSci 2018-19</p>