

General Information

Module Code

BIO-6001A

Academic Year

2021/2

Module Title

MOLECULAR ENZYMOLOGY IN BIOLOGY AND MEDICINE

Module type

WW

Semester / Term

SEM1

Level

6

Credit Value

20

Scheme

UG

Related Modules:

Pre-requisite

BIO-5002A OR CHE-5601Y

Co-requisite**Forbidden**

Timetable slot

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Is this module suitable for inbound study abroad students?

Y

Additional costs

Maximum number of students

999

Module Organiser

Professor Andrew Hemmings

Module Description**What is this module about?**

The module sets out to explain the molecular basis of the often complex catalytic mechanisms of enzymes concentrating particularly on their relevance to and applications in biotechnology and medicine. An extended practical based on the kinetics of a model enzyme, chymotrypsin, helps underpin concepts learnt in the module.

Learning objectives and Outcomes**What are the Learning objectives?**

1. Have a mature appreciation of the methods by which enzyme structures are solved and how this data can be used to explain enzyme catalytic mechanism;
2. Develop an understanding of how enzyme structure data can be exploited to develop specific inhibitors as lead compounds in drug development;
3. Have a thorough grasp of the structure-function relationships of a range of complex molecular motors;
4. Develop a critical understanding of the mechanisms by which important enzymes such as P450s detoxify xenobiotics and metabolize drugs;
5. Design an enzyme assay with a view to minimizing experimental error;
6. Gain knowledge of how to account for experimental error in the analysis of enzyme assay data.

What are the Learning Outcomes?

Name	Details
1	Enzyme structure-function relationships The ability to explain the relationships between enzyme structure and function with a view to understanding enzyme catalytic mechanisms
2	Molecular level description of enzyme action The ability to describe how a range of physiologically- and medically-relevant enzymes work at the molecular level
3	Roles of enzymes in biotechnology & medicine The ability to explain the roles of a range of enzymes in biotechnology and medicine

4**Experimental design & data analysis**

The ability to design and execute solution experiments to measure the kinetic parameters for a model enzyme system and be able to explain how these results in terms of aspects of the enzyme mechanism

Learning activities and Effort hours

Learning activity	Total effort hours	Indicative effort hours per week
1. Class sessions (Lectures, workshops, lab sessions, seminars etc.)	50	5
2. Pre-class preparation and follow up study	92	9.2
3. Work-based or Placement Hours	0	0
4. Formative assessments/ activities	1	0.1
5. Feedback/ Feed forward sessions	0	0
6. Summative assessments (essays, dissertations, oral presentations, worksheets, lab reports etc.)	30	3
7. Background reading	24	2.4
8. Exams/ OSCEs	3	0.3
9. Course Tests	0	0
10. Tutorials (Individual or small groups)	0	0
Total Hours =	200.00	20.00

Learning Support Materials**Should this module be exempt from requiring an online reading list?**

N

Link to Talis (<https://uea.rl.talis.com/index.html>)

Formative Assessments

Sequence	Assessment Type	Title	Deadline
FM1	Formative Assessment	Analysis of Enzyme Kinetic Data	
FM2	Formative Assessment	SEM1 Visiting Students: Analysis of Enzyme Kinetic Data	

Summative Assessments

Sequence	Assessment Type	Title	Deadline	Weighting	Method of submission	Method of return	Return c
002	Written Assignment	Practical Report (2500 words)	09/Dec/2021	40 / 100	Coursework: Turnitin submission point	VIA BLACKBOARD	17/Jan/2

Further Details

003	Exam Standard	Examination		60 / 100			
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Further Details

Attribute Development

On this module students will develop knowledge, insights and attributes that are readily transferable into future or current work settings. The attributes are articulated below to help understand how the module will help students to thrive on their course and prepare them for the world of work. These attributes are also articulated within the UEA Award.

Academic excellence

- In-depth and extensive knowledge, understanding and skills in chosen discipline(s)

- The ability to collect, collate, analyse and critically engage with a wide range of information sources, and evidence
- The ability to analyse and critically engage with a wide range of concepts and ideas

Critical thinking & problem solving

- A capacity for independent, conceptual and creative thinking
- A capacity for informed argument and logical reasoning
- A capacity for problem identification and problem-solving

Learning & personal development

- A commitment to developing professional values, self-insight and capabilities
- The ability to respond positively to constructive criticism and feedback from peers, tutors and colleagues
- Self-confidence and an ability to exercise own 'voice'

Digital literacy and IT

- Confidently employ a range of digital technologies for academic and professional/ career development purposes
- Use appropriate digital technologies and resources to locate diverse types of information for both academic and non-academic purposes
- The ability to critically evaluate and engage with the information obtained

Self-management & professionalism

- A capacity for taking responsibilities and ownership of actions
- An ability to manage time effectively, including setting priorities, juggling competing demands and meeting deadlines
- An understanding of work cultures and practices, including work place professionalism

Team working and leadership

- An ability to co-operate and collaborate with others, including working to shared aims
- An ability to take other viewpoints, have empathy for other people's position and give constructive feedback
- An ability to motivate and lead others, including taking the initiative and delegating when required

Communication

- An ability to communicate in written form for different purposes, audiences and contexts
- An ability to communicate in person for different purposes, audiences and contexts
- An ability to network effectively with others for specific purposes

Applied numeracy and Technical proficiency

- An ability to perform routine calculations in daily tasks and in applied contexts
- An ability to analyse and interpret data and evidence
- Proficiency in skilled techniques used for academic and professional purposes

Career management

- A capacity to reflect on and articulate qualities, strengths and attributes
- The ability to research specific job and career areas
- An ability to present your experience and attributes positively to graduate employers

Commercial awareness

- A knowledge of the link between academic subjects and their commercial applications
- An understanding of business priorities and the needs of graduate employers
- The ability to understand and prioritise customer needs

Innovation and enterprise

- The confidence to introduce and establish something new
- The potential to take an idea through to its practical application
- The potential to apply an enterprising mind-set to situations

Citizenship and stewardship

- An understanding of your place within local and global communities
- An awareness of the need to manage shared and finite resources, including an appreciation of moral and ethical dimensions
- An ability to improve the lives of others and lobby for positive change through community and/or political engagement