

Macao Polytechnic Institute
School of Health Sciences and Sports
Bachelor of Science in Biomedical Technology
(Pharmacy Technology)
Module Outline

Academic Year 2021 / 2022 Semester 1

Learning Module	Biopharmaceutics(生物藥劑學)			Class Code	BSBP3101
Pre-requisite(s)	Nil				
Medium of Instruction	Chinese / English			Credit	2
Lecture Hours	26 hrs	Lab/Practice Hours	4 hrs	Total Hours	30 hrs
Instructor	郎斌 Langbin		E-mail	blang@ipm.edu.mo	
Office	Room M727, Meng Tak Building, Main Campus		Telephone	85993440	

Description

This 30-hour learning module is one of the foundation courses of the pharmacy program.

Biotechnology Pharmaceuticals (30 hours) – Introduce the basic concepts of producing biopharmaceuticals using techniques of biotechnology. Discussions on pharming, pharmacogenomics and GM foods are also included.

Learning Outcomes

After completing the learning module, students will be able to:

1. be familiar with the theories and knowledge related to the production and uses of biopharmaceuticals.
2. be familiar with the biotechnology medicines include recombinant proteins, monoclonal antibodies, vaccines and antibiotics.
3. understand the knowledge and concepts of pharmacogenomics, GM foods, pharming and gene therapy.

Content

1. Introduction to Biopharmaceuticals (3 class hours)
 - 1.1 Introduction to pharmaceutical products
 - 1.2 Definition of biopharmaceuticals
 - 1.3 The age of biopharmaceuticals
 - 1.4 Biopharmacy technology

2. Genetic Engineering of Pharmaceuticals (8 class hours)
 - 2.1 Development of genetic engineering pharmacy
 - 2.2 Basic process of genetic engineering for pharmaceutical
 - 2.3 Instance of genetic engineering for pharmaceutical:
 - 2.3.1 Insulin
 - 2.3.2 Erythropoietin (EPO)
 - 2.3.3 Interferons (IFN)

3. Cell Engineering of Pharmaceuticals (6 class hours)
 - 3.1 Introduction to cell engineering
 - 3.2 Cell culture technology used in the pharmaceutical
 - 3.3 Hybridoma technology and monoclonal antibodies
 - 3.4 Stem cell research: application and challenge

4. Introduction to Pharmaceutical Products (4 class hours)
 - 4.1 Antibodies:
 - 4.1.1 Monoclonal antibodies
 - 4.1.2 Polyclonal antibodies
 - 4.2 Vaccines
 - 4.2.1 Traditional vaccine preparations
 - 4.2.2 The impact of genetic engineering on vaccine technology
 - 4.2.3 Development of an AIDS vaccines
 - 4.2.4 Cancer vaccines
 - 4.3 Cytokines
 - 4.4 Blood products

5. Enzymes Engineering and Microbial Fermentation for Pharmaceuticals (1 class hours)

6. Genetically Modified Foods (1 class hours)
 - 6.1 Transgenic plant
 - 6.2 Transgenic animal

7. Gene Therapy (1 class hours)
 - 7.1 Basic approach to gene therapy
 - 7.2 Gene therapy and genetic disease
 - 7.3 Some additional questions in gene therapy
8. Individual Assignment and Presentation (4 class hours)
9. Examination (2 class hours)

Practice (4 hours)

Class Practice

Date & Time	Practice Item	Title	Students / Group	Mode of Practice	Requirement
2021/11/23 14:30-16:30	Presentation and discuss	Progress and clinical application of biopharmaceuticals	2-3 students per group	Oral presentation	Power-point of the subject issue should be submitted before the presentation for assessment.
2021/11/30 14:30-16:30	Presentation and discuss	Progress and clinical application of biopharmaceuticals	2-3 students per group	Oral presentation	

Teaching Method

Lectures, videos, case studies, group discussion.

Attendance

Attendance requirements are governed by the “Academic Regulations Governing Bachelor’s Degree Programmes of Macao Polytechnic Institute”. Students are not eligible to attend the final examination and re-sit examination, moreover, an “F” will be given as the final grade to students who have less than the stated attendance for the enrolled learning module.

Assessment

This learning module is graded on a 100 point scale, with 100 being the highest possible score and 50 being the passing score.

	Item	Description	Percentage
1.	Group assignment	Presentations and group assignment	40%
2.	Examination	Content of the course	60%
Total Percentage:			100%

Students with a score of less than 35 in the final examination must take the re-sit examination even if the overall score for the learning module is 50 or above.

Teaching Material(s)

Textbook(s)

There is no required textbook for this course.

Reference

Reference book(s)

1. Gary Walsh, 2013, Biopharmaceuticals: Biochemistry and Biotechnology, 2nd Edition, Wiley-Blackwell Publishing.
2. Chandrakant Kokate, 2011, Textbook of Pharmaceutical Biotechnology, 1st Edition, Elsevier.
3. 王鳳山, 2011, 生物技術制藥, 第二版, 人民衛生出版社.