



University of Nicosia, Cyprus

Course Code IMMU-544	Course Title Immunotechnology	ECTS Credits 8
Department Life and Health Sciences	Semester Spring	Prerequisites IMMU-541 Cellular and Molecular Immunology
Type of Course Required	Field Biomedical Sciences	Language of Instruction English
Level of Course 2 nd Cycle	Year of Study 1 st	Lecturer Nicolaou Stella; Chryso Pierides
Mode of Delivery Face to Face	Work Placement N/A	Co-requisites None

Objectives of the Course:

The aim of this course is to inform students on the immunobiotechnology based developments for use in the medicine for therapeutics and diagnostics purposes.

The specific objectives of the course are:

- To provide a solid understanding of the pure and applied science underlying the biotechnology industry,
- To introduce the techniques and processes involved in the development of therapeutics, vaccines, and diagnostics,
- To introduce stem cell and genetic technologies.
- To help students understand Immunoinformatics and its application
- To introduce students the language and law involved in business and innovation.

Learning Outcomes:

On completion of this course, the student will be able to:

- Appraise the methods for monoclonal and polyclonal antibody production, purification, characterization and their use in research and diagnosis.
- Use bioinformatics for the design of antibodies and vaccines and to explain the basis of vaccine development
- Discuss the methods for antigen and antibody engineering and their applications
- Evaluate the biotechnology (recombinant DNA) based applications in vaccine development, in research and in laboratory diagnostic applications
- Distinguish and access the immunotechnology based industrial products available commercially

- Develop an understanding of ethical issues and commercial aspects of immunotechnology based products and their use.

Course Contents:

1. Animal models and transgenic animals and their use in immunology.
2. Monoclonal and polyclonal antibody production, purification, characterization; ELISA - principle and applications
3. Immunocytochemistry, immunofluorescence
4. Immunoenzymatic and immunoferritin techniques
5. Immuno-electrophoresis; Radioimmuno assay (RIA) principles and applications; Non-isotopic detection (antigens-enhanced chem. luminescence assay)
6. Molecular modeling and Immunoinformatics
7. Application of DNA technology to study the immune system
8. Antigen engineering for diagnosis; Antibody engineering for diagnosis, for immunotherapy (Chimeric, humanized antibodies); (application of PCR technology)
9. Tissue isolation, Stem cell technology.
10. Large scale manufacture of antibodies; Manufacturing of immunodiagnostics.
11. Vaccine development: Recombinant vaccines, combined vaccines, polyvalent vaccines.
12. Technology for Cell Mediated Immunity
13. Technology for immunotoxins

Learning Activities and Teaching Methods:

Lectures; problem based learning, poster and/or oral presentations. The lecturer will be introducing each topic through lectures and problem based learning sections with individual tasks related to data analysis.

Assessment Methods:

Assignments, Presentations, Tests and Mid-term Exam/Paper; Final Exam

Required Textbooks/Reading:

Authors	Title	Publisher	Edition	ISBN
Anthony Moran, James Gosling	Immunotechnology: Principles, Concepts and Applications Paperback	John Wiley & Sons	(July 2003)	ISBN-10: 0471899119 ISBN-13: 978- 0471899112

Recommended Textbooks/Reading:

Authors	Title	Publisher	Edition	ISBN
Dr. B. Annadurai	A Textbook of Immunology & Immunotechnolog y	S Chand & Co Ltd	(2010)	ISBN-10: 8121928079 ISBN-13: 978- 8121928076
Virendra Gomase, Sunilkumar Dwivedi	Immunobiotechnology: Targets of Life	VDM Publishing	2010	ISBN-10: 3639250176, ISBN-13: 9783639250176
Patrick Chames	Antibody Engineering: Methods and Protocols, Second Edition (Methods in Molecular Biology) [Hardcover]	Humana Press;	2nd ed. 2012 edition	ISBN-10: 1617799734 ISBN-13: 978- 1617799730
Gail Lewis Phillips	Antibody-Drug Conjugates and Immunotoxins: From Pre-Clinical Development to Therapeutic Applications [Kindle Edition]	Springer;	(2012)	ASIN: B00BLQCGIG

