



**University of Nicosia, Cyprus**

<b>Course Code</b> IMMU-548	<b>Course Title</b> Tumor immunology and Cancer Immunotherapy	<b>ECTS Credits</b> 7
<b>Department</b> Life and Health Sciences	<b>Semester</b> Spring/Summer	<b>Prerequisites</b> None
<b>Type of Course</b> Elective	<b>Field</b> Biomedical Sciences	<b>Language of Instruction</b> English
<b>Level of Course</b> 2 <sup>st</sup> Cycle	<b>Year of Study</b> 1 <sup>st</sup>	<b>Lecturer</b> Koumas Laura Chryso Pierides
<b>Mode of Delivery</b> Face-to-face	<b>Work Placement</b> N/A	<b>Co-requisites</b> None

**Objectives of the Course:**

This course will provide a deep understanding of the mechanisms by which the immune system responds to cancer cells and the mechanisms that cancer cells use to resist the system, and how these interactions relate to the diagnosis of cancer responses to immunotherapy.

The aims of the course are to:

- Discuss how the immune system interacts with cancer cells and how cancer cells avoid immunosurveillance.
- Describe how immunotherapy is used and monitored to treat/combat cancer
- Review the different approaches to cancer immunotherapy
- Present the diagnostic tests and molecules used to measure tumor responses to immunotherapy.

**Learning Outcomes:**

After completion of the course students are expected to be able to:

- Demonstrate how the various cellular mechanisms can form the basis of antitumor immunity and immunotherapy strategies.
- Account for the molecules and effector cells that participate in the recognition of cancer cells and describe how their interactions determine the fortune of tumors.
- Describe how cancer cells avoid immunosurveillance.
- Account for the properties of tumour cells that must be overcome in immunotherapy.
- Apply knowledge and interpret scientific literature on novel immunotherapeutic strategies and appraise the diagnostic tests to be used to monitor effective responses.
- Review critically scientific literature and report on analytical technologies used in cancer immunotherapy monitoring.

### Course Contents:

- Innate immunity in cancer ; T- lymphocytes and cancer; animal tumor models
- Coupling tumor genotype with phenotype
- CLL tumor heterogeneity and clonal evolution; CLL driver genes
- Dendritic cells and the tumor microenvironment
- Macrophages and the tumor microenvironment
- Humoral (B cells) immunity and cancer
- CD4+ T and CD8+ T cell immunity and cell-modulating strategies; Single Cell High Throughput Technologies Immune Monitoring
- Cytokines and chemokines; Immunosuppression
- Host response to tumours (immunoediting)
- Infection and Cancer
- Tumour immune evasion (immunosurveillance avoidance)
- Myeloid-derived suppressor cells (MDSC) and regulatory T cells
- Exosomes and cancer
- Types of cancer immunotherapies and follow up response methods

### Learning Activities and Teaching Methods:

Lectures; presentations and discussions of biotechnology/nonotechnology examples from scientific literature. Cooperative learning. Demonstration: Familiarization with data/graphs of experimental output; video presentations of technological applications and analytical instruments used.

### Assessment Methods:

Assignments/Exercises; Oral presentations and written reports; Mid-term and Final Exam

### Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
Michael R Shurin, Viktor Umansky, Anatoli Malyguine	The Tumor Immunoenvironment	Springer;	2013 edition	<b>ISBN-10:</b> 940076216X <b>ISBN-13:</b> 978-9400762169
Olivier Gires, Barbara Seliger	Tumor-Associated Antigens: Identification, Characterization, and Clinical Applications	Wiley-Blackwell	1 ed.(2009)	<b>ISBN-10:</b> 3527320849 <b>ISBN-13:</b> 978-3527320844

Revisiting cancer immunoediting by understanding cancer immune complexity. Manjili MH. J Pathol. 2011 May;224(1):5-9.

Immunosurveillance in human non-viral cancers. Fridman WH, Mlecnik B, Bindea G,

**Recommended Textbooks/Reading:**

<b>Authors</b>	<b>Title</b>	<b>Publisher</b>	<b>Year</b>	<b>ISBN</b>
Glenn Dranoff	Cancer Immunology and Immunotherapy	Springer;	2011 edition	<b>ISBN-10:</b> 3642141358 <b>ISBN-13:</b> 978-3642141355
Joseph Rosenblatt, Eckhard Podack, Glen N. Barber, Augusto Ochoa	Advances in Tumor Immunology and Immunotherapy	Springer;	2014 edition	<b>ISBN-10:</b> 1461488087 <b>ISBN-13:</b> 978-1461488088
Natalia Aptsiauri, Angel Miguel Garcia-Lora, Teresa Cabrera	MHC Class I Antigens In Malignant Cells: Immune Escape And Response To Immunotherapy	Springer;	2013 edition	<b>ISBN-10:</b> 1461465427 <b>ISBN-13:</b> 978-1461465423

