

وصف المقرر Course Syllabus

الكلية				الطب البشري	
القسم	الأحياء الدقيقة و علم الامراض و الطب الشرعي				ثانيه
اسم المقرر	علم المناعة	الرمز	111501208	متطلب سابق	لا يوجد
الساعات المعتمدة	3	نظري	3	عملي	0
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وقت المحاضرة	9am-12pm		المكان	كلية الطب البشري	شكل الحضور هجين
الفصل الدراسي	الصيفي 2023/2022		تاريخ الإعداد	2023/11/5	تاريخ التعديل 2023/11/5

وصف المقرر المختصر

A medical immunology course is designed to provide students with a comprehensive understanding of the body's immune system, focusing on its structure, function, and its role in health and disease. Students delve into the intricate mechanisms of immune responses, learning about the cells, tissues, and organs involved, as well as the processes that regulate immunity. The course covers innate and adaptive immunity, detailing how the body recognizes and defends against pathogens. It also explores the immunological basis of various diseases, including autoimmune conditions, allergies, and immunodeficiencies. Students gain insight into immunological techniques used for diagnosis, such as ELISA and flow cytometry, and learn about the principles behind immunotherapies and vaccines. Overall, the course equips students with the foundational knowledge required to comprehend, analyze, and apply immunological concepts in clinical scenarios and research settings, preparing them for future medical practice.

أهداف المقرر

By the end of the course the students will be able to:

- Understanding the Immune System: Gain a deep comprehension of the anatomy, physiology, and biochemistry of the immune system, including the cells, tissues, and organs involved in immune responses.

- Immunological Principles: Comprehend the fundamental principles of immunology, including antigen recognition, immune response activation, and immune cell communication.
- Innate and Adaptive Immunity: Differentiate between innate and adaptive immunity, understanding their distinct functions, mechanisms, and how they coordinate in the body's defense against pathogens.
- Immunological Disorders: Identify and understand the etiology, pathophysiology, and clinical manifestations of various immune-related disorders such as autoimmune diseases, hypersensitivities, immunodeficiencies, and allergies.
- Immune Response Regulation: Explore the mechanisms that regulate immune responses, including tolerance, immune cell activation, and the role of cytokines and chemokines in modulating immune reactions.
- Vaccines and Immunotherapy: Understand the principles of vaccination, the different types of vaccines, and the mechanisms behind immunotherapies used in the treatment of diseases.
- Laboratory Techniques: Familiarize with laboratory techniques used in immunology, such as ELISA, flow cytometry, and various assays to measure immune responses.
- Clinical Application: Relate immunological concepts to clinical scenarios, understanding how immunological principles apply to disease diagnosis, treatment, and patient care.
- Research Skills: Develop basic skills in interpreting immunological research papers, critically evaluating experimental data, and understanding research methodologies in immunology.
- Communication and Collaboration: Enhance communication skills for discussing complex immunological concepts with peers, patients, and other healthcare professionals.

مخرجات التعلم CILOs

المعرفة

- a1. Definition of Immunology
- a2. Importance of Immunology
- a3. Historical background of Immunology
- a4. Modern Immunology
- a5. Outline the major principles of the human immune response (innate immunity, humoral immunity, and adaptive immunity)
- a6. The organs and tissues of the immune system
- a7. Hematopoiesis and formation of blood cells
- a8. Immune cells classes, functions, and circulation
- a9. Immune cells development and maturation
- a10. Definition of antigens and epitopes
- a11. Types and sources of antigens
- a12. Antigen processing and presentation

- a13. The roles of Major Histocompatibility Complex (MHC)
- a14. Discuss the role of antigen presentation in generating immunity.
- a15. Antigen based treatment: types, mechanism of action, indications, and side effect
- a16. Immunoglobulin structure and binding site/s
- a17. Immunoglobulin classes and their characteristics
- a18. the role of Immunoglobulin's in neutralization, opsonization, antibody-dependent cellular cytotoxicity (ADCC), complement and mucosal immunity.
- a19. Introduction to artificial antibodies including monoclonal and polyclonal antibodies.
- a20. Using antibodies in treatment
- a21. Discuss the concept of innate immunity - features, importance.
- a22. Explain how the innate immune system recognizes foreign antigens in general.
- a23. Outline the components of the innate immune system.
- a24. Discuss how these components combat various foreign antigens.
- a25. Overview of the inflammatory process: initiation, inflammation, resolution
- a26. Benefits and liabilities
- a27. Major constituents
- a28. Clinically relevant inflammatory processes
- a29. Control of inflammation
- a30. Understand the main steps of leukocytes migration and circulation.
- a31. Understand the main adhesion molecules involved in leukocytes adhesions.
- a32. Understand the roles of chemokines in leukocytes activation.
- a33. Non-steroidal anti-inflammatory drugs
- a34. Explain the principles of adaptive immunity.
- a35. Introduce the immune cells that mediate adaptive immunity and their specific roles in immune response to varying pathogens/antigens.
- a36. Discuss the differences between cell-mediate immunity and humoral immunity.
- a37. Explain what interactions are required for activation of T cells and B cells.
- a38. Discuss the stages of cellular and humoral immunity.
- a39. Discuss immunological memory and outline the differences between primary and secondary (memory) responses.
- a40. Compare and contrast the innate and adaptive immune response.
- a41. Define and discuss the general characteristics of tolerance.
- a42. Define the main factors that influence the development of tolerance.
- a43. Identify the main mechanisms of tolerance induction in B and T cells.
- a44. Identify the mechanisms involved in the development of autoimmunity.
- a45. Approach to treatment of autoimmune diseases
- a46. Introduction to tumor types and etiology
- a47. Tumors associated with antigens and markers.
- a48. Evidence for Immune Reactivity to Tumors
- a49. Discuss immune protection against tumors and immune surveillance system.
- a50. Discuss immune mediated tumor growth.
- a51. Provide an overview of experimental cancer therapies.
- a52. What is the difference between hypersensitivity and protective immunity?
- a53. Overview of the four major classifications of human hypersensitivity.

- a54. Type I hypersensitivity – Mechanisms (allergens, Th2 immunity, IgE, immediate and late phase reactions) and clinical overview
- a55. Type 2, 3,4 hypersensitivities – Mechanisms and clinical consequences
- a56. Currently practiced vs. novel (experimental) approaches to clinical management of hypersensitivity
- a57. Differentiates active and passive immunity.
- a58. To understand the types of currently used vaccines, the differences, and the mechanisms of protection
- a59. Vaccination scheme, routes of administration, and common side effects
- a60. To understand how to develop a vaccine and the general requirements for vaccine development and adjuvants.
- a61. To understand the new concept of vaccines against non-microbes such as self or tumor molecules
- a62. Understand the main principles and applications of transplantation immunology.
- a63. Understand the different mechanisms of transplant rejection and its clinical manifestations.
- a64. Discuss laboratory investigations applied to transplantation.
- a65. Understand the role of immune suppressive drugs in transplantation.

المهارات

- b1. Comprehensive Understanding of Immunological Concepts: Mastery of fundamental principles, including the functions of immune cells, cytokines, antibodies, and the mechanisms of immune response.
- b2. Cellular and Molecular Knowledge: Ability to describe the cellular and molecular components of the immune system, including different types of immune cells and their functions.
- b3. Clinical Application of Immunology: Applying immunological knowledge to clinical scenarios, such as diagnosing and treating immunological disorders.
- b4. Laboratory Techniques: Proficiency in conducting and understanding various immunological laboratory techniques used in diagnostics and research, such as ELISA, western blotting, and flow cytometry.
- b5. Critical Thinking and Analysis: Capacity to critically evaluate immunological research papers, interpret experimental data, and understand research methodologies in immunology.
- b6. Diagnostic Skills: Ability to apply immunological techniques to diagnose and monitor immune-related conditions and interpret test results.
- b7. Immunotherapy Understanding: Understanding the principles behind immunotherapies and their applications in treating diseases related to the immune system, including cancer and autoimmune disorders.
- b8. Problem-Solving Skills: Applying immunological knowledge to solve complex clinical problems and adapting to changing disease conditions.
- b9. Communication Skills: Articulating complex immunological concepts to patients, peers, and other healthcare professionals in a clear and understandable manner.
- b10. Research Skills: Acquiring a foundation for further research in immunology, enabling students to contribute to the field's advancements and innovations.
- b11. Data Analysis and Interpretation: Analyzing experimental results and drawing meaningful conclusions from data obtained through immunological experiments.
- b12. Understanding of Immune Response Regulation: Grasping the mechanisms that regulate immune responses, including tolerance, immune cell activation, and the role of cytokines and chemokines.

الكفايات

- c1. Demonstrating a deep understanding of the structure and function of the immune system, including the mechanisms of innate and adaptive immunity.
- c2. Explaining the concepts of antigen recognition, processing, and presentation in immune responses.
- c3. Applying immunological knowledge to diagnose, manage, and treat immune-related disorders and diseases.
- c4. Recognizing the immunological basis of various diseases and their manifestations.
- c5. Proficiency in using and interpreting results from various immunological laboratory techniques, such as ELISA, western blotting, and flow cytometry.
- c6. Evaluating and interpreting scientific literature in immunology, critically analyzing experimental data and research methodologies.
- c7. Applying immunological knowledge to solve clinical problems and understand disease conditions related to the immune system.
- c8. Understanding the ethical considerations related to immunological research and patient care, particularly concerning informed consent and research ethics.
- c9. Communicating complex immunological concepts effectively to diverse audiences, including patients, peers, and healthcare professionals.
- c10. Understanding the principles and applications of various immunotherapies used in treating immune-related disorders, such as cancer and autoimmune diseases.
- c11. Grasping the mechanisms that regulate immune responses, including tolerance, activation, and the role of cytokines and chemokines.

طرق التعليم والتعلم

The course will be delivered through a combination of active, in-class and online, learning strategies. These will include:

- PowerPoint lectures and active classroom-based discussion
- Live online-delivered lectures
- Relevant papers and reading materials
- Movies
- E-learning resources: e-reading assignments, virtual meetings, and practice quizzes through Microsoft Teams.

أدوات التقييم

-Online quizzes

-Written exams

محتوى المقرر

أسبوع	ساعات	المخرجات	المواضيع	طرق التعليم والتعلم	أدوات التقييم
.1	5	a1-a8; b1-b2; c1	General Introduction and Organs and Cells of the Immune System	PowerPoint lectures and active classroom-based discussion, live	Discussions, online quizzes

	online-delivered lectures, paper discussions				
Discussions, online quizzes	PowerPoint lectures and active classroom-based discussion, live online-delivered lectures, paper discussions	Antigen and antibody structure and function	a9-a20; b2-b4, c2-c3	5	.2
Discussions, online quizzes	PowerPoint lectures and active classroom-based discussion, live online-delivered lectures, practical laboratory sessions	Principles of Innate and adaptive Immunity	a21-a24; a34-a40, b4-b9; c4-c9	5	.3
Midterm Exam	PowerPoint lectures and active classroom-based discussion, live online-delivered lectures, practical laboratory sessions	Inflammation, Leukocyte Activation and Migration	a25-a33; b5-b10; c5-c10	4	.4
Discussions, online quizzes	PowerPoint lectures and active classroom-based discussion, live online-delivered lectures, practical laboratory sessions	Autoimmunity and Tolerance	A41-45; b8-b12; c4-c8	5	.5
Discussions, online quizzes	PowerPoint lectures and active classroom-based discussion, live online-delivered lectures, practical laboratory sessions	Tumor Immunology and Hypersensitivity	a46- a57;b7- b12, c8- c11	5	.6

Discussions, online quizzes	PowerPoint lectures and active classroom-based discussion, live online-delivered lectures, practical laboratory sessions	Vaccines and Transplantation Immunology	A58-65;b7-12; c8-11	5	.7
Final Exam	-	-	-	0	.8

المكونات	
1. "Basic Immunology: Functions and Disorders of the Immune System" by Abul K. Abbas, Andrew H. Lichtman, and Shiv Pillai. Sixth edition 2. Essentials of Clinical Immunology, 6th Edition Helen Chapel, Mansel Haeney, Siraj A. Misbah, Neil Snowden 3. Lippincott Illustrated Reviews: Immunology 3rd Edition	الكتاب
	المراجع
Selected articles (will be available to students as electronic versions), as well course lecture PowerPoints.	موصى به للقراءة
Additional reading, clinical notes, and reviews.	مادة إلكترونية
	مواقع أخرى

خطة تقييم المقرر		
المخرجات	الدرجة	أدوات التقييم
A1-a40; b1-b8;c1- c8	50	الامتحان الأول (المنتصف)
		الامتحان الثاني (عملي)
Inclusive a1-a65;b1-b12;c1-c11	50	الامتحان النهائي
		أعمال الفصل

							الوظائف/ الواجبات	تقييمات الأعمال الفصلية
							حالات للدراسة	
							المناقشة والتفاعل	
							انشطة جماعية	
							امتحانات مختبرات ووظائف	
							عروض تقديمية	
a1-a65;b1-b12;c1-c11						0	امتحانات قصيرة	
							أخرى	
						100	المجموع	