[첨부 2] 강의개요

KUOCW 참여강의 개요

※ 실제로 진행된 강의에 대한 개요입니다.

1. 교과목 개요

교과목명(국문)	**분자면역학**
[선택] 교과목명 (영문)	**Molecular Immunology**
교수자명	**이진협**
교과목 학습목표	the purpose of the **KFBT403 Molecular Immunology** course is to provide a basic knowledge of the immune response and its involvement in health and disease. The study of immunology will enable the student to gain a broad foundation base and build upon that base for understanding the defense mechanisms of the human body.
교과목 소개	**FBT403 Molecular Immunology** course is an introductory immunology course designed for non-majors, or individuals beginning their study in the field. Thus, the goal of the formal lectures will be to provide students with the fundamental knowledge of the immune system.
교과목 키워드	Immunology, Innate, Adaptive, T cell, B cell, Macrophagy, Neutrophil, Antigen, Antibody, Vaccine, Differentiation, Phagocytosis, Lymphocyte

2. 주차별 강의 내용 및 연관 파일명

주차	주제	내용 요약	해당 주차의 강의자료 파일명
1	Introduction to the Immune System	Immunity is defined as resistance to disease, specifically infectious disease. The collection of cells, tissues, and molecules that mediate resistance to infections is called the immune system, and the coordinated reaction of these cells and molecules to infectious microbes is the immune response. Immunology is the study of the immune system, including its responses to microbial pathogens and damaged tissues and its role in disease.	Lecture 1
2	Innate Immunity	As multicellular organisms such as plants, invertebrates, and vertebrates arose during evolution, they had to develop mechanisms for defending	Lecture 2

		themselves against microbial infections and for eliminating damaged and necrotic cells. The defense mechanisms that evolved first are always present in the organism, ready to recognize and eliminate microbes and dead cells; therefore, this type of host defense is known as innate immunity, also called natural immunity or native immunity.	
3	Antigen Capture and Presentation to Lymphocyte	Adaptive immune responses are initiated by the recognition of antigens by antigen receptors of lymphocytes. B and T lymphocytes differ in the types of antigens they recognize. The antigen receptors of B lymphocytes—namely, membrane-bound antibodies—can recognize a variety of macromolecules (proteins, polysaccharides, lipids, nucleic acids), in soluble form or cell surface–associated form, as well as small chemicals. Therefore, B cell–mediated humoral immune responses may be generated against many types of microbial cell wall and soluble antigens.	Lecture 3
4	Antigen Recognition in the Adaptive Immune System	Antigen receptors serve critical roles in the maturation of lymphocytes from progenitors and in all adaptive immune responses. In adaptive immunity, naive lymphocytes recognize antigens to initiate responses, and effector T cells and antibodies recognize antigens to perform their functions. B and T lymphocytes express different receptors that recognize antigens: membrane-bound antibodies on B cells and T cell receptors (TCRs) on T lymphocytes.	Lecture 4
5	T Cell-Mediated Immunity	T lymphocytes perform multiple functions in defending against infections by various kinds of microbes. A major role for T lymphocytes is in cell-mediated immunity (CMI), which provides defense against infections by	Lecture 5

		intracellular microbes. Two types of infections may lead to microbes finding a haven inside cells, from where they must be eliminated by cell-mediated immune responses.	
6	Effector Mechanisms of T Cell-Mediated Immunity	Host defense in which T lymphocytes serve as effector cells is called cell-mediated immunity. T cells are essential for eliminating microbes that survive and replicate inside cells, and for eradicating infections by some extracellular microbes, often by recruiting other cells to clear the infectious pathogens.	Lecture 6
7	Humoral Immune Responses	Humoral immunity is mediated by antibodies and is the arm of the adaptive immune response that functions to neutralize and eliminate extracellular microbes and microbial toxins. Humoral immunity is also the principal defense mechanism against microbes with capsules rich in polysaccharides and lipids. This is because B cells respond to, and produce antibodies specific for, many types of extracellular and cell surface molecules, including polysaccharides, lipids, and proteins, but T cells, the mediators of cellular immunity, recognize and respond only to protein antigens that are internalized into or synthesized in cells.	Lecture 7
8	Effector Mechanisms of Humoral Immunity	Humoral immunity is the type of host defense mediated by secreted antibodies and necessary for protection against extracellular microbes and their toxins. Antibodies prevent infections by blocking the ability of microbes to bind to and enter host cells. Antibodies also bind to microbial toxins and prevent them from damaging host cells. In addition, antibodies function to eliminate microbes, toxins, and infected cells from the body.	Lecture 8
9	Immunological Tolerance and Autoimmunity	One of the remarkable properties of the normal immune system is that it can react to an enormous variety of	Lecture 9

		microbes but does not react against the individual's own (self) antigens. This unresponsiveness to self antigens, also called immunological tolerance, is maintained despite the fact that the molecular mechanisms by which lymphocyte receptor specificities are generated are not biased to exclude receptors for self antigens.	
10	Immune Responses against Tumors and Transplants	Cancer and organ transplantation are two clinical situations in which the role of the immune system has received a great deal of attention. In cancer, it is widely believed that enhancing immunity against tumors holds much promise for treatment. In organ transplantation, of course, the situation is precisely the reverse: Immune responses against the transplants are a barrier to successful transplantation, and learning how to suppress these responses is a major goal of transplant immunologists.	Lecture 10
11	Hypersensitivity	The concept that the immune system is required for defending the host against infections has been emphasized throughout this book. However, immune responses are themselves capable of causing tissue injury and disease. Injurious, or pathologic, immune reactions are called hypersensitivity reactions. An immune response to an antigen may result in sensitivity to challenge with that antigen, and therefore hypersensitivity is a reflection of excessive or aberrant immune responses.	Lecture 11
12	Congenital and Acquired Immunodeficiencies	Defects in the development and functions of the immune system result in increased susceptibility to newly acquired infections; reactivation of latent infections such as cytomegalovirus, Epstein-Barr virus, and tuberculosis, in which the normal immune response keeps the infection in check but does not eradicate it;	Lecture 12

		and increased incidence of certain cancers. These consequences of defective immunity are predictable because, as emphasized throughout this book, the normal function of the immune system is to defend individuals against infections and some cancers. Disorders caused by defective immunity are called immunodeficiency diseases.	
13			
14			
15			
16			