# The First Page of Teaching Plan

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**Objectives and requirements**

**Teaching Purpose:**
To understand the basic medical immunology course outline related to the main content and related basic concepts, understanding of the chapters relate to one another the progress and introduction of immunology in medical education status, for follow-up chapters lay the foundation for a preliminary study.

**Teaching Requirements:**
1. Grasp the traditional and modern concepts of immunity.
2. Grasp the function of the immunity.
3. Familiar with the composition of the immune system.
4. Familiar with the concept, composition and characteristic of innate immune response and adaptive immune response. Compare the basic processes of innate immunity and adaptive immune response. Compare the cells and molecules involved in the basic processes of the innate immunity and adaptive immune response.
5. Learn about the curriculum content and overview.

**Important points and difficulties**

**Important points:**
Modern definition of Immunology and basic functions of the Immune system; definition of innate and adaptive Immunity; basic structural and functional components of the immune system; application of immunology in medical field

**Difficult points:**
The process of Immune response

**Updated information**

Same as last year

**Teaching time arrangement**

**Methods:**
Heuristic classroom teaching

**Content:**
1. History of Immunology (30min)
2. Basic Functions of the Immune system(30min);
3. Concept of Immunity: Innate and Adaptive immunity (components and Characteristics)(50min)
4. Immune system(40min)
5. The process of Immune response(40min)

**Teaching methods**
CAI and related clinical cases

**Books and references**

**Basic materials:**
Medical Immunology (6th edition)

**Reference material:**
Medical Immunology(10th edition), Medical Immunology(Kuby Immunology), Medical Immunology(Xian Jiao Tong University)
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objectives and requirements

**Teaching Purpose:**
Antigen is a precondition and starting point for the immune responses. Learn the concept of antigen, character of antigen, conditions of immune responses, the specificity of antigen, the types of antigen and its medical significance in this chapter.

**Teaching Requirements:**
1. Grasp the concept of antigen and the two fundamental properties of antigen (immunogenicity and immunoreactivity), grasp the concept of hapten.
2. Master the immunogenicity and specificity of antigen. Familiar with the meaning of foreignness. Master the concept of epitope, classification, functional epitope, T cell epitope, B cell epitope, common antigen, cross-reaction.
3. Master the classification of antigen: the characteristics of TD-Ag and TI-Ag, xenogenic antigen (pathogenic microorganisms, animal sera, etc.), allogenic antigen, autoantigen, heterophilic antigen and its clinical significance, tumor antigens (TSA, TAA), understanding other classification methods of antigen.
4. Understand the influencing factors of antigen in immune response.
5. Understanding the concept, types and mechanisms of other non-specific immune stimulants (adjuvants, super-antigen and mitogen).

Important points and difficulties

**Important points:**
Definition and classification of antigen; definition and classification of antigen determinants.

**Difficult points:**
The importance of foreignness; classification of antigen determinants; TD-Ag and TI-Ag, cross reaction.

updated information

Same as last year

Methods:
Heuristic classroom teaching

Content:
1. Definition and two basic characteristics of the antigen; definition of hapten(30min).
2. Definition of Immunogenesity and antigenecity; foreignness ; definition of epitope; classification and function of T cell and B cell epitopes. definition of common antigen and cross reaction(70min);
3.Classification of antigen(60min)
4.Factors that influence the Immunogenecity of the antigen(20min)
5. Definition and classification of adjuvant, super antigen and mitogen and their working mechanism(20min).

teaching methods

CAI and related clinical cases
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**objectives and requirements**

**Teaching Purpose:**
Antibody is the important effector molecules mediated the humoral immunity. Membrane Ig is the antigen receptor on the membrane of B cell. Learn the concept of Ab and Ig, the basic structure of Ig, the serotype of Ig, the biological activity of Ig, the characteristics and biological functions of five types of immunoglobulin, the concept of monoclonal antibody in this chapter.

**Teaching Requirements:**
1. Grasp the concept of Ab and Ig.
2. Grasp the molecular structure of immunoglobulin (basic structure, variable region and constant region, functional area and function, hydrolysis fragment).
3. Grasp the biological activity of Ig (the function of V region, the function of C region).
4. Understanding of the heterogeneity of antibody.
5. Grasp the characteristics and functions of various types of Ig.
6. Familiar with the concepts, principles and characteristics of the monoclonal antibody, understanding the concept, preparation and characteristics of polyclonal antibodies, to understand the concept of genetically engineered antibodies.

**Important points and difficulties**

**Important points:**
Basic structure, biological functions and characteristics of five Immunoglobulins.

**Difficult points:**
The functional regions of Immunoglobulins

**updated information**
Same as last year

**Teaching time arrangement**

**Methods:**
Heuristic classroom teaching

**Content:**
1. Definition of Ig(20min), structure of of Ig(80min), biological function of Ig(30min),
2. The characteristics of Ig(40min), McAb and gene construction Ab(30min)

**teaching methods**
CAI and related clinical cases

**Basic materials:**
Medical Immunology (6th edition)

**Reference material:**
Medical Immunology(10th edition), Medical Immunology(Kuby Immunology), Medical Immunology( Xian Jiao Tong University)
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Complement System

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<td>Complement is an important part of the innate immune response, is also one of the main mechanism to exert immune effects of the body. Learn the concept and the composition of complement system, the necessary conditions of three pathways to activate complement, process, regulation and control, the main biological activity of the complement system in this chapter and thus have a comprehensive understanding.</td>
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<td>Three activation pathways and biological functions of complement.</td>
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| updated information | Same as last year |

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<tr>
<td>Content</td>
<td>1. Definition and the components of the complement(20min); the activation and control of the complement(100min) 2. Biological functions of the complement(40min) 3. Clinical importance of the complement(40min)</td>
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| teaching methods | CAI and related clinical cases |

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## objectives and requirements

**Teaching Purpose:**
Cytokines in immune cell differentiation and development, immune regulation, inflammatory response, hematopoietic function play an important role in both, and to participate in a variety of human physiological and pathological processes happened and development. Study this chapter of cytokine function, classification, receptors, the common characteristics and biological effects and mechanisms, which cytokines have a basic understanding of a more systematic and to follow-up study lay the foundation for the chapters.

**Teaching Requirements:**
1. Grasp the concept of cytokines. Familiar with the types of cytokines (IL, interferon, tumor necrosis factor, colony-stimulating factor, growth factor, chemokine).
2. Familiar with the common characteristics of cytokines; production and secretion characteristics; the characteristics of biological effects.
3. Familiar with the biological activity of cytokines: anti-virus, anti-bacteria; accelerate inflammatory; mediate regulation of immune response; stimulate hematopoiesis.
4. Understanding of the types of cytokine receptors, soluble cytokine receptors and their clinical significance.

## Important points and difficulties

**Important points:**
1. Definition and classification of cytokine
2. Common characteristics, forming and secretion and the biological functions of the cytokine.

**Difficult points:**
1. Biological functions of cytokins
2. Classification of cytokine receptors.

## updated information

Same as last year

## teaching methods

**Methods:**
Heuristic classroom teaching

**Content:**
1. Definition of cytokine (5min); classification of cytokine (15min); Common characteristics, forming and secretion and the biological functions of the cytokine(30min).
2. Biological function of cytokins(30min)
3. Classification of cytokine receptors(20min)

## books and references

**Basic materials:**
Medical Immunology (6th edition)

**Reference material:**
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**Teaching Purpose:**
Leukocyte differentiation antigens and adhesion molecules are important elements of the immune cell membrane molecules. Study with CD molecules related the recognition and the activation of T, B lymphocytes, the classification and function of adhesion molecules in this chapter.

**Teaching Requirements:**
1. Grasp the concept of leukocyte differentiation antigens and CD.
2. Familiar with CD molecules related the recognition, adhesion and activation of T lymphocytes.
3. Familiar with CD molecules related the recognition, adhesion and activation of B lymphocytes.
4. Grasp the concept of adhesion molecules. Familiar with the classification of adhesion molecules. Understand adhesion molecules related T, B lymphocytes. Familiar with the function of AM.
5. Understanding of CD and adhesion molecules and its clinical application of monoclonal antibodies.

**Important points:**
1. The concept of leukocyte differentiation antigens and CD
2. The concept of adhesion molecules.

**Difficult points:**
1. CD molecules related the recognition, adhesion and activation of T lymphocytes.
2. The classification of adhesion molecules.

**Methods:**
Heuristic classroom teaching

**Content:**
1. the concept of LDA and CD(5min); 2. CD molecules related the recognition, adhesion and activation of T lymphocytes. (25min); 3. CD molecules related the recognition, adhesion and activation of B lymphocytes. (25min); 4. The concept of adhesion molecules (5min).5. The classification of adhesion molecules. (10min); 6. Adhesion molecules related T, B lymphocytes (15min).7. Function of AM. (10min)8. clinical application(5min)

**teaching methods**
CAI and related clinical cases

**books and references**

**Basic materials:**
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# Teaching Plan

## Major Histocompatibility Complex

### Teaching Purpose:
The main functions of major histocompatibility complex (MHC) are involved in antigen presentation, constraints the identification among cells and induction of immune responses, are one of important basis for learning immunology. Learn the concept of MHC and its genes and expression products, the genetic characteristics of MHC, the relationship between MHC molecules and the antigenic peptide, the relationship between HLA and clinical medicine in this chapter.

### Teaching Requirements:
1. Grasp the concept of MHC. Familiar with classical HLA class I and class II gene and its expression products (structure and function). Understand the immune function-related genes and the meaning of polygenic characteristic.
2. Familiar with the concept of polymorphism, understanding the emergence of polymorphism and its significance. Familiar with the genetic characteristics of MHC.
3. Understanding interactions between MHC molecules and antigenic peptide, understanding the characteristics of interaction.
4. Familiar with the relationship between HLA and clinical medicine (organ transplantation, abnormal expression and disease, the association with HLA and disease, its applications in forensic).

### Important Points and Difficulties

#### Important Points:
1. Definition of MHC
2. Classical HLA-I and HLA-II genes and their products
3. Polymorphism and the relevance of MHC molecules and the antigen peptide.

#### Difficult Points:
1. Classical HLA-I and HLA-II genes and their products
2. Immunofunctions related genes and polymorphism.
3. Occurrence of polymorphism and its role.

### Updated Information
Same as last year

### Teaching Time Arrangement

#### Methods:
Heuristic classroom teaching

#### Content:
1. Discovery and Definition of MHC(20min).
2. Classical HLA-I and HLA-II genes and their products(60min);
3. Immunofunctions related genes and polymorphism. (20min);
4. Genetic features of MHC(40min).
5. Relevance of MHC molecules and the antigen peptide.(20min);
6. The clinical relations of HLA(40min).

### Teaching Methods
CAI and related clinical cases
**Basic materials:**
Medical Immunology (6th edition)

**Reference material:**
Medical Immunology(10th edition), Medical Immunology(Kuby Immunology), Medical Immunology( Xian Jiao Tong University)

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**Teaching Purpose:**
Innate immunity, also known as non-specific immune, is the first line of defense to resist the infection with pathogenic microbes, but also involved in the initiation, effects and regulation of adaptive immune responses. Study the composition of innate immune mechanisms and its effects, in particular, the cells participate in innate immunity, such as phagocytic, NK cells and NKT cells in this chapter, at the same time understanding of other innate immune cells.

**Teaching Requirements:**
1. Grasp the concept of innate immunity, composition, understanding its phase in anti-infective immunity.
2. Grasp the function of Mononuclear phagocytes system. Familiar with its important surface markers.
3. Familiar with KAR and KIR of NK cell and mutual adjustment. Grasp the biological activity of NK cells.
4. Understanding the surface markers and biological activity of NKT cells, αδT cells and B1 cells.
5. Understanding of other innate immune cells.

**Important points and difficulties**

**Important points:**
1. The concept of innate immunity, composition
2. The function of Mononuclear phagocytes system.

**Difficult points:**
1. KAR and KIR of NK cell and mutual adjustment

**Methods:**
Heuristic classroom teaching

**Content:**
1. The concept of innate immunity, composition (30min)
2. The function of Mononuclear phagocytes system. (10min)
3. Important surface markers of MPS. (10min)
4. KAR and KIR of NK cell and mutual adjustment (20min)
5. The biological activity of NK cells. (10min)
6. The surface markers and biological activity of NKT cells, αδT cells and B1 cells. (15min)
7. Other innate immune cells (5min)

**Basic materials:**
Medical Immunology (6th edition)

**Reference material:**
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Objectives and requirements

**Teaching Purpose:**
Lymphocytes are the main cell types to constitute the immune system. T cell mediate the cellular immune response, support the humoral immune response. This chapter introduce the TCR/CD3 complex, through which the T cell recogniz the antigen and transduct the signal; CD4 and CD8, the T cells co-receptor molecules; the major concerted molecules constitut the second active signals of T cells; the subsets of T cells and their functions.

**Teaching Requirements:**
1. Master the structure and function of the TCR-CD3 complex.
2. Familiar with the main function of CD4, CD8, CD28, CTLA-4, CD40L, LFA-1. Master the mitogen of T cells.
3. Familiar with the structure and function of ITAM, ITIM.
4. Master the subsets of the T-cell and their function, as well as the switching of the subsets and its significance.

Important points and difficulties

**Important points:**
1. The surface marker of T lymphocytes and its role in lymphocyte activation.
2. T cell development in Thymus.
3. CD4+T cell and CD8+T cell, and Th1 cell and Th2 cell.
4. MHC restriction, discuss the differences between MHC restriction of CD4+ T cells and MHC restriction of CD8+ T cells.

**Difficult points:**
1. T cell development in Thymus
2. MHC restriction, discuss the differences between MHC restriction of CD4+ T cells and MHC restriction of CD8+ T cells.

Updated information

Same as last year

Teaching time arrangement

**Methods:**
Heuristic classroom teaching

**Content:**
1. T cell development(100min): selections
2. T cell surface markers(100min): The structure and function of TCR-CD3 complex, The concept of ITAM, the structure and function of CD4 and CD8 molecules. The function of CD28, CTLA-4, LFA-1, CD40L, The mitogen-receptor of T cells and the mitogen PHA, ConA.
3. T cell subsets(100min): The type of TCR; CD4&CD8; the significance of the switching of the Th subsets; the function of Tr1 cell; CD8'T cells can be divided into Tc1 and Tc2. the regulatory T cells (Treg);the native T cells, the concept and the sign of the memory T cells.

Teaching methods

CAI and related clinical cases
| books and references | Basic materials:  
Medical Immunology (6th edition)  
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| comments from the department | This lecture is in accordance with the outline of Immunology.  
Acknowledged to teach the five-year Han nationality, ethnic undergraduate students in Medicine, Nursing, Oral Medicine, Preclinical Medicine, Medical Imaging, Forensic Medicine, Anesthesiology and Clinical Laboratory Science and seven-year students in Chinese and Western Integrative Medicine.  
Department Dean:__________ |
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| professional title | time of writing | |
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| chapter | B Lymphocytes | time of using | |
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**Teaching Purpose:**
B lymphocyte mediate the humoral immune response. Introduce the BCR / Igα, Igβ complex, through which the T cell recognize the antigen and transduct the signal; the molecules participate the activation and response of B cell; the subsets of B-cell and their functions.

**Teaching Requirements:**
1. Master the structure and function of the BCR complex; know the co-receptor of B cells’ activation; the complement receptor; the Fc receptor. Familiar with the costimulatory molecules CD40 and its functions.
2. Familiar with the subsets of the B cells, the difference between B1 and B2 cells.
3. Master the function of B cell.

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<th>Important points and difficulties</th>
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**Important points:**
1. The surface marker of B lymphocytes and its role in lymphocyte activation.
2. The function of B cell.

**Difficult points:**
1. The co-receptor of B cells’ activation
2. The difference between B1 and B2 cells

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<th>Teaching time arrangement</th>
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**Methods:**
Heuristic classroom teaching

**Content:**
1. The structure and function of the BCR complex; (15min) 2. Compare the TCR and BCR complexes; (10min) 3. The structure and function of the co-receptor of the activation of B cells (CD19/CD21/CD81); the structure and function of CD40 (25min). 4. The subsets of B-cell. (30min)The function of B-cell.(20min).

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CAI and related clinical cases

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<th>books and references</th>
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**Basic materials:**
Medical Immunology (6th edition)

**Reference material:**
Medical Immunology(10th edition), Medical Immunology(Kuby Immunology), Medical Immunology( Xian Jiao Tong University)

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Acknowledged to teach the five-year Han nationality, ethnic undergraduate students in Medicine, Nursing, Oral Medicine, Preclinical Medicine, Medical Imaging, Forensic Medicine, Anesthesiology and Clinical Laboratory Science and seven-year students in Chinese and Western Integrative Medicine.

Department Dean: ______________
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**objectives and requirements**

**Teaching Purpose:**
The innate immune response play a significant role in the non-specific anti-infective process of the body, also play an important role in the initiation, regulation and effector phase of the adaptive immune response. Introduce the Organization, cell, effective molecule and the effective phase of the innate immunity, the characteristics of the innate immune response and its relationship with the adaptive immune response.

**Teaching Requirements:**
Familiar with the organizations, cell and molecule involved in the innate immunity. Know the phase of the innate immune response. Familiar with the characteristics of the innate immune response and its relationship with the adaptive immune response.

**keys and difficulties**

**Important points:**
The organizations, cell and molecule involved in the innate immunity

**Difficult points:**
The characteristics of the innate immune response and its relationship with the adaptive immune response.

**updated information**
Compared to the previous version, this chapter’s content include the BCR and TCR.

**arrangement**

**Methods:** Heuristic classroom teaching

**Content:**
1. The tissue barriers and its function of the innate immunity; the innate immunity cells and their major function; the innate immunity effective molecules. (35min) 2. The effective phase of the innate immunity. (15min). 3. The characteristics of the identification of the innate immune response, the effective characteristics of the innate immunity cells. (40min) 4. The relationship between the innate immune response and the adaptive immune response. (10min)

**teaching methods**
Heuristic classroom teaching, CAI and related clinical cases

**books and references**

**Basic materials:**
Medical Immunology (6th edition)

**Reference material:**
Medical Immunology (10th edition), Medical Immunology (Kuby Immunology), Medical Immunology (Xian Jiao Tong University)
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<td>chapter</td>
<td>APC and Antigen processing</td>
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## objectives and requirements

**Teaching Purpose:**
Antigen-presenting cells (APC) uptake, antigen processing and presenting to lymphocytes, which play an important role in the immune response. Introduce the concept and species of antigen-presenting cells, characteristics of the professional APC, antigen-uptaking method and the two basic pathways of antigen-presenting and their mechanisms.

**Teaching Requirements:**
- **Master:** the concept of APC, the species and characteristics of the professional antigen-presenting cells; the antigen-presenting process of exogenous and endogenous antigen.
- **Know:** the markers, differentiation, development, migration and antigen uptake processing of DC; the antigen presenting process by B cells.

## Important points and difficulties

**Important points:**
The concept and characteristics of APC, the professional APC; the two basic pathways of antigen-presenting.

**Difficult points:**
Antigen-uptaking method and the two basic pathways of antigen-presenting and their mechanisms.

## updated information

Combine the content of this chapter with those of Antigen, MHC and other related sections to teach.

## Teaching time arrangement

**Methods:**
Heuristic classroom teaching

**Content:**
1. The concept of APC, the species and characteristics of the professional antigen-presenting cells (20’). 2. Antigen uptake processing (20’). 3. The antigen-presenting process of exogenous and endogenous antigen (50’). 4. Cross presenting of the two pathways (10’).

## teaching methods

Heuristic classroom teaching, CAI and related clinical cases

## books and references

**Basic materials:**
Medical Immunology (6th edition)

**Reference material:**
Medical Immunology (10th edition), Medical Immunology (Kuby Immunology), Medical Immunology (Xian Jiao Tong University)
According to different classes, the antigen-presenting ways of CD1 molecules could be referred, so the students would fully understand the different types of antigen-presenting process. Understanding contents were selected or not according to the class being taught.

This lecture is in accordance with the outline of Immunology. Acknowledged to teach the five-year Han nationality, ethnic undergraduate students in Medicine, Nursing, Oral Medicine, Preclinical Medicine, Medical Imaging, Forensic Medicine, Anesthesiology and Clinical Laboratory Science and seven-year students in Chinese and Western Integrative Medicine.

Department Dean: __________
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<td>The adaptive immunity: T lymphocytes’ antigen recognition and immune response</td>
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### Objectives and requirements

**Teaching Purpose:**
T Cell-mediated immunity cells are one type of the specific immune response. Introduce the basic process of cell-mediated immunity, the dual recognition to antigen by T cells and the MHC restriction; the dual signals of T cell’s activation; the action mechanism of the two types of effective cells (Tc, Th1) and the pathophysiological significance of the cellular immune responses.

**Teaching Requirements:**
- **Master:** the concept and the basic process of the cellular immunity; the dual recognition to antigen by T cells, the MHC restriction; the function of the two types of effective cells (Tc, Th1), the effect of the cellular immunity.
- **Familiar with:** the dual activation signal of T cell.
- **Know:** its clinical application and significance.

### Important points and difficulties

**Important points:**
1. The characteristic of the recognition to antigen by T cells. The dual recognition to antigen by T cells, the MHC restriction; the dual signals of T cell’s activation.
2. The function of the two types of effective cells (Tc, Th1), the effect of the cellular immunity.

**Difficult points:**
1. The recruitment of Mφ and the characteristics of killing Mφ by Th1 cells.
2. The lysis of the target cells and killing mechanism by CTL

### Updated information

The concept of the immune synapse, the polarization ofCTL

### Teaching time arrangement

**Methods:**
- Heuristic classroom teaching

**Content:**
- Overview of Ir(30min), The cellular immunity(20min), the characteristic of the recognition to antigen by T cells(30min), two signals in T cell activation.(40min), The lysis of the target cells and killing mechanism by effect T (60min), the effect of the cellular immunity(20min)

### Teaching methods

Heuristic classroom teaching, CAI and related clinical cases

### Basic materials

- Medical Immunology (6th edition)

### Reference material

- Medical Immunology(10th edition), Medical Immunology(Kuby Immunology), Medical Immunology( Xian Jiao Tong University)
| teachers’ group discussion about the plan | The signal transduction wasn’t introduced, the summary of the cell-mediated immunity was added. This chapter is a key one of the specific immunity, as well as a very good review and summary to the front section’s contents. Understanding contents were selected or not according to the class being taught. |
| comments from the department | This lecture is in accordance with the outline of Immunology. Acknowledged to teach the five-year Han nationality, ethnic undergraduate students in Medicine, Nursing, Oral Medicine, Preclinical Medicine, Medical Imaging, Forensic Medicine, Anesthesiology and Clinical Laboratory Science and seven-year students in Chinese and Western Integrative Medicine. Department Dean: |
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## Teaching Purpose:
B cell-mediated humoral immune responses are one type of the specific immune response. This chapter focuses on introducing the basic process that B cell response to TD-Ag, the dual activation signal of B cell, the supporting role on B cells by Th1 cells, the general rules of antibody’s production and the effect of the humoral immunity; the response to the TI-Ag by B cells and its effects.

## Teaching Requirements:
**Master:** the concept and the basic process of the humoral immunity; B cells response to TD-Ag, including the recognition to the TD-Ag by BCR, the dual activation signal of B cell, the supporting role on B cells by Th cells, the general rules of antibody’s production and its application; the function of the humoral immunity.

**Familiar with:** class switch; the response to TI-Ag by B cells, antibody affinity maturation.

**Know:** receptor revision, somatic hypermutation and Ig affinity maturation, the generation of the memory B cell.

## Important points:
The basic process of the humoral immunity; B cells response to TD-Ag; the general rules of antibody’s production.

## Difficult points:
The response to TI-Ag by B cells, antibody affinity maturation.

## Methods:
Heuristic classroom teaching

## Content:
1. The basic process of B cells’ response to TD-Ag(40’).
2. The dual activation signal of B cell(30’).
3. The supporting role on B cells by Th cells(40’).
4. The general rules of antibody’s production and its application; the function of the humoral immunity(60’).
5. The response to TI-Ag by B cells(30’).

## Notes on Teaching Plan:
B Cell’s proliferation and terminal differentiation

## Teaching methods:
Heuristic classroom teaching, CAI and related clinical cases
| books and references | **Basic materials:**  
Medical Immunology (6\textsuperscript{th} edition)  
**Reference material:**  
Medical Immunology(10\textsuperscript{th} edition), Medical Immunology(Kuby Immunology), Medical Immunology( Xian Jiao Tong University) |
| teachers’ group discussion about the plan | The signal transduction wasn’t introduced, the summary of the humoral immunity was added. Class switch, the characteristics of affinity maturation could be taught with the corresponding ch12. Understanding contents were selected or not according to the class being taught. |
| comments from the department | This lecture is in accordance with the outline of Immunology. Acknowledged to teach the five-year Han nationality, ethnic undergraduate students in Medicine, Nursing, Oral Medicine, Preclinical Medicine, Medical Imaging, Forensic Medicine, Anesthesiology and Clinical Laboratory Science and seven-year students in Chinese and Western Integrative Medicine.  
Department Dean: |
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## objectives and requirements

**Teaching Purpose:**
The immune system forms a multi-faceted, multi-system immune adjustment mechanism to control the quantity and quality of the immune response in the long-term evolution. Introduce antigens, antibodies, complement, inhibitory receptors on the regulation of immune response in the molecular level; the T-cell subsets, idioptic network, apoptosis on the regulation of immune response in the cell level; the regulation between the neuro-endocrine and immune system in the overall level, the immune regulation in the groups level.

**Teaching Requirements:**
- **Master:** the regulation of the T-cell subsets.
- **Familiar with:** the regulation which the antigen, antibodies, components of complement involved in, the regulation of the inhibitory receptors, apoptosis’s regulation on the immune response.
- **Know:** the idioptic network’s regulation, the immune regulation in the groups and overall level.

## keys and difficulties

**Important points:**
The regulation of the T-cell subsets, the regulation of the inhibitory receptors, apoptosis’s regulation on the immune response.

**Difficult points:**
The idioptic network’s regulation, apoptosis’s regulation on the immune response. The immune regulation of MHC polymorphism.

**updated information**
- NK cell’s KIR and CD94/NKG2A, etc, Tr cell’s regulation, the mitochondrial pathway of apoptosis of T cells

## arrangement

**Methods:** Heuristic classroom teaching

**Content:** the regulation which the antibodies, components of complement involved in, the regulation of the inhibitory receptors (10min), the regulation of the T-cell subsets (10min), the idioptic network’s regulation (10min), apoptosis’s regulation on the immune response (10min), the immune regulation in the groups and overall level (10min).

## teaching methods

Heuristic classroom teaching, CAI and related clinical cases

## books and references

**Basic materials:**
Medical Immunology (6th edition)

**Reference material:**
Medical Immunology (10th edition), Medical Immunology (Kuby Immunology), Medical Immunology (Xian Jiao Tong University)
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**Teaching Purpose:**
Immune tolerance is a special form (negative response) of the immune response, with a specific immune response that opposite to the positive response. But both are important component of the immune system’s functions. Introduce the formation of the immune tolerance, the conditions and mechanisms of the immune tolerance induced, the way to establish and break the immune tolerance and its clinical significance.

**Teaching Requirements:**
- **Master:** The concept of immune tolerance.
- **Familiar with:** The conditions of inducing the acquired immune tolerance, the different characteristics of T/B cell’s tolerance.
- **Know:** The mechanism of the immune tolerance, the way to establish and break the immune tolerance and its clinical significance.

**Important points:**
The concept of immune tolerance, the conditions of inducing the acquired immune tolerance, the different characteristics of T/B cell’s tolerance.

**Difficult points:**
The mechanism of the immune tolerance, clonal anergy, immunological ignorance.

**Updated information:**
- the significance of cytokines in the Peripheral immune tolerance, the significance of signal transduction block

**Methods:**
Heuristic classroom teaching

**Content:**
1. the concept of the immune tolerance, Phenomena of the natural immune tolerance and the acquired immune tolerance model of animals (5’). 2. the conditions of inducing the acquired immune tolerance, including antigens and antibodies; the dose of antigens: resulted in a low band tolerance and a high band tolerance; the different characteristics of T cells and B cell tolerance;the types of antigen(20’). 3. The mechanisms of the immune tolerance, including the mechanisms of the central tolerance and the peripheral tolerance (20’). 4. the relationship between the immune tolerance and the clinical, including the principle and the significance of the establishing and breaking the immune tolerance (5’).

**Teaching methods:**
Heuristic classroom teaching,CAI and related clinical cases
| books and references | **Basic materials:**
Medical Immunology (6th edition)
**Reference material:**
Medical Immunology (10th edition), Medical Immunology (Kuby Immunology), Medical Immunology (Xian Jiao Tong University) |
| teachers’ group discussion about the plan | Conclude the development of B and T lymphocytes, give examples to interpret the important and different contents with the auto-immune diseases and tumor diseases. Understanding contents were selected or not according to the class being taught. |
| comments from the department | This lecture is in accordance with the outline of Immunology. Acknowledged to teach the five-year Han nationality, ethnic undergraduate students in Medicine, Nursing, Oral Medicine, Preclinical Medicine, Medical Imaging, Forensic Medicine, Anesthesiology and Clinical Laboratory Science and seven-year students in Chinese and Western Integrative Medicine. 
Department Dean: ____________ |
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## objectives and requirements

**Teaching Purpose:**
Hypersensitivity is abnormal adaptive immune response to the antigens in the body, an important part of the clinical immunology. Introduce the concept and classification of hypersensitivity, the mechanism of four type of hypersensitivity, the relevant principles of the prevention and the common diseases.

**Teaching Requirements:**

**Master:** the concept and types of hypersensitivity, the mechanisms and characteristics of different type hypersensitivity, the prevention principles of the hypersensitivity I.

**Familiar with:** the common diseases of the various types of hypersensitivity.

## Important points and difficulties

**Important points:**
The concept and types of hypersensitivity; components, mechanism, related diseases, the prevention and therapy principles of type I hypersensitivity; components of mechanism of type II, III and IV hypersensitivity.

**Difficult points:**
Components, mechanism, related diseases, the prevention and therapy principles of type I hypersensitivity; mechanism of type II, III and IV hypersensitivity.

## updated information

Compare the characteristics of four types of hypersensitivity

## Teaching time arrangement

**Methods:**
Heuristic classroom teaching

**Content:**

## teaching methods

Heuristic classroom teaching, CAI and related clinical cases

## books and references

**Basic materials:**
Medical Immunology (6th edition)

**Reference material:**
Medical Immunology (10th edition), Medical Immunology (Kuby Immunology), Medical Immunology (Xian Jiao Tong University)
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<td>chapter</td>
<td>Immunoprevention and Immunotherapy</td>
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## Teaching Purpose:
Immunoprevention is a method which use immunology principle to remove pathogenic factor, thus preventing disease. Immunotherapy is a method which intervene the body to achieve therapeutic purposes through enhancing or suppressing the immune function. The application of immunotherapy is wide range and diversified. this chapter introduce the artificial active immunization, the artificial passive immunization and their corresponding biological agents, the new vaccines, the immunization treatment methods(enhancement or inhibition therapy, specific treatment and non-specific treatment), Immunotherapy based on antigens, antibodies, cytokines and their antagonists , as well as the common agents.

## Teaching Requirements:
**Master:** The concept and the difference of the artificial active immunization, the artificial passive immunization; the concept of the immunetherapy.

**Familiar with:** The common biological agents; the characteristics of the died vaccines and the live vaccine; the types of the new vaccines; the classification of the immunotherapy; the common agents used in the molecular therapy and the cell therapy.

**Know:** The application of vaccines; the concept and agents of the biological response modifiers, the common immune inhibitor.

## Important points:
Characteristics of artificial active and artificial passive Immunity. The common biological response modifiers and the immunosuppressive agents.

## Difficult points:
The classification of new vaccine and the monoclonal antibody targeted therapy the content of the Gene-engineering antibodies and the common classification. The adoptive immunotherapy.

## Methods:
Heuristic classroom teaching combine with PBL.

## Content:
The artificial automatically immune, including the concept; the common agents; the difference between the died vaccine and the live vaccine; the concept of the toxoid; the novel vaccine (the Subunit vaccine, the Conjugate vaccines, the Synthetic peptide vaccines, the Gene-engineering vaccine); the application of the vaccine(30’); the artificial passive immunization, including the concept ;the common biological agents(20’).
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| books and references | **Basic materials:**  
Medical Immunology (6\(^{th}\) edition)  
**Reference material:**  
Medical Immunology (10\(^{th}\) edition), Medical Immunology (Kuby Immunology), Medical Immunology (Xian Jiao Tong University) |
| teachers’ group discussion about the plan | Same as last year |
| comments from the department | This lecture is in accordance with the outline of Immunology. Acknowledged to teach the five-year Han nationality, ethnic undergraduate students in Medicine, Nursing, Oral Medicine, Preclinical Medicine, Medical Imaging, Forensic Medicine, Anesthesiology and Clinical Laboratory Science and seven-year students in Chinese and Western Integrative Medicine.  
Department Dean: |