

Immunology Laboratory Course syllabus

Department of Immunology of BMS

1. Basic information of the course

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|-----------------------|--|---------------|--|-----------------------|
| Course Name | Immunology laboratory Course | | | |
| Course Code | | | | |
| Teaching Department | Department of Immunology | | | |
| Experiment Type | <input checked="" type="checkbox"/> Professional basic experiment <input type="checkbox"/> Professional experiment <input type="checkbox"/> Comprehensive experiment <input type="checkbox"/> Innovative experiment <input type="checkbox"/> Open experiment | | | |
| Course Type | <input checked="" type="checkbox"/> Compulsory <input type="checkbox"/> Elective | | | |
| Experimental Type | <input type="checkbox"/> Independent course <input checked="" type="checkbox"/> Non-independent course | | | |
| For Which Major | | | | |
| Credits | | Lecture Hours | | Experiment Hours 24 |
| Prerequisite course | Immunology | | | |
| Website of the course | | | | |

2. Course Description

The objective of this course is to provide basic techniques commonly used in immunology research laboratories. The course is intended for undergraduate students majoring in medicine. The experimental content includes two modules. Antigen and

antibody detection module provides experience in Agglutination Reaction, Precipitation Reaction, Complement Fixing Test and enzyme-linked immunosorbent assay(ELISA). Immune cells and immune function module provides experience in preparation of cell suspensions from spleen of mice, separation of human peripheral blood mononuclear cell, detection of mouse macrophage phagocytosis, analysis of antibody-forming cells in vitro, production of polyclonal antibodies and the following assays with ELISA, as well as Guinea pig allergy test. A working knowledge of basic immunology is needed for the class.

3. Course character and teaching objective

【Teaching objectives】

- 1) To enable students to master the basic experimental principles, methods and skills of medical immunology.
- 2) To develop students' practical ability and innovative ability.
- 3) To apply the theory of medical immunology to solve clinical practical problems.
- 4) At the same time, through the experimental class, students can better master the theoretical knowledge of immunology.

【Teaching requirements】

- 1) Either previous completion or concurrent enrollment in “Immunology” is an ABSOLUTE REQUIREMENT!
- 2) Master the basics of biochemistry
- 3) Master the basics of cell biology
- 4) If you have learned physiology and tissue embryos, you will learn this course better.

【Quizzes】

There will be quizzes given during the course. The quizzes will be based on material from the lectures and experimental protocols in the manual or ask you to explain sample data obtained in the lab.

Experiment I Agglutination Reaction

【Teaching objectives】

1. To master the principle, features and classifications of the agglutination reaction.
2. To master the specificity, proportionality and reversibility of antigen-antibody response.

【Contents】

1. Tube Agglutination Test
3. Slide Agglutination Test (Human ABO blood type assay)

【Time】

4 hours

Experiment II Precipitation Reaction

【Teaching objectives】

1. To grasp the principle, features of the precipitation reaction.
2. To understand the relationship between antigen and antibody according to the characteristics of sedimentation line.

【Contents】

1. Double Agar Diffusion Test
2. Single Agar Diffusion Test (show)

[Time]

4 hours

Experiment III Complement Fixing Test

【Teaching objectives】

1. To grasp the principle, methods, result analysis of the complement fixing test.
2. To comprehend the significance of each control tubes.

【Contents】

1. Complement Fixing Test
2. Bio-products (in common use) Introduction

【Time】

4 hours

Experiment IV**Polyclonal antibody preparation and detection of immune serum titer with Enzyme-Linked Immunosorbent Assay (ELISA)****【Teaching objectives】**

1. To understand why we immunize mice with red blood cells of sheep three times
2. To understand the factors that influence immune serum titers.
3. To grasp the principle, methods, result analysis of the ELISA.
4. To understand the application of ELISA.

【Contents】

1. Immunization of mice with red blood cells of sheep for three times.
2. Detection of immune serum titer with ELISA (Indirect method)

【Time】

4 hours

Experiment V Isolation of spleen cells**【Teaching objectives】**

1. To grasp the principle and methods of mouse spleen cells isolation.

2. To be familiar with the applications of spleen cells in immunology experiments.

【Contents】

1. Isolation of spleen cells

[Time]

4 hours

Experiment VI

Separation of Human Peripheral Blood Mononuclear Cells (PBMCs)

【Teaching objectives】

1. To master the principle of separating peripheral blood mononuclear cells.
2. To understand the application of density gradient centrifugation

【Content】

1. Separating PBMCs with density gradient centrifugation
2. Cells counting under microscope.

【Time】

4 hours

Experiment VII Phagocytosis of Macrophage

【Teaching objectives】

1. To understand the mechanism and features of type I hypersensitivity
2. To be familiar with the methods measuring phagocytosis function of macrophages.

【Contents】

1. Phagocytosis of Macrophage—in vitro

2. Hypersensitivity Test in Guinea Pig

[Time]

4 hours