Syllabus of Molecular Biology Experiments Shandong University School of Basic Medical Sciences

Writers:

Time:

1. Basic information of the course

Course Name	Molecular Biology Experiments				
Course Code	233213512				
Teaching Department	Department of Biochemistry and Molecular Biology, School of basic medical sciences				
Experiment Type	☑Professional basic experiment □Professional experiment □Comprehensive experiment □Innovative experiment □Open experiment				
Course Type	☑Compulsory □Elective				
Experimental Type	☑Independent course □Non-independent course				
For Which Major	Clinical medicine				
Credits		Lecture Hours		Experiment Hours	12
Prerequisite course					
Website of the course					

2. Course Description

Molecular Biology Experiment is an important basic and skill training course of medicine. Gene cloning based on molecular biology has become the core of modern biological technology.The contents include the basic principles and the application of molecular biology techniques, such as gene cloning, extraction of plasmid and electrophoresis. The purposes of this course are to master basic methods, design and result analysis of molecular biology experiments, to train and cultivate the students' operation ability, independent thinking and problem-solving skills.

3.Teaching content and teaching hour allocation

Experiment 1. **E**xtraction of plasmid DNA (4 credit hours)

(1) Gene cloning

(2) Cloning vector----- Plasmid

(3)Experiments

Extraction of plasmid DNA

【teaching objectives and requirements】

(1) Familiar with the extraction process of plasmid DNA.

(2) Master the basic methods of extraction of plasmid DNA

Experiment 2. Digesting DNA with restriction endonuclease Hind Ⅲ and EcoR I (4 credit hours)

(1) restriction endonuclease

(2) EcoR I and Hind III

(3) Experiments

①Digesting DNA with restriction endonuclease EcoR I

②Digesting DNA with restriction endonuclease HindⅢ

【teaching objectives and requirements】

Master the basic methods and the technique of digesting DNA with restriction endonuclease

Experiment 3. Agarose gel Electrophoresis analysis of digesting DNA products with restriction endonuclease (4 credit hours)

(1)Electrophoresis: principle, working methods and applications, and the main point is agarose gel electrophoresis

(2)Experiments

①the preparation of agarose gel

②Agarose gel Electrophoresis of DNA.

③Analysis of results of agarose gel Electrophoresis

【teaching objectives and requirements】

(1) Master the methods and techniques for detecting DNA by agarose gel Electrophoresis.

(2) Master the concentration of agarose gel.

(3) Familiar with the preparation of agarose gel

(4) Understand the dyeing rinciple of fluorescent dyes.

4. Annual update of the experimental projects

5.Assessment and evaluation methods

EXPERIMENTS Total mark: 15 points

DISTRIBUTION: classroom performance 5 points, experimental reports 10 points

6.Textbooks and bibliography

【Textbooks】

【Bibliography】