

Microbial Chemistry

Special Subjects
Elective 2 credit

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1. Course Description

After reviewing the basic knowledge of microbiology, this course covers the basic and hot topics of pathogenic microorganisms, prevention of their infection, and chemical therapy using the supplementary materials provided.

The following subjects will be studied during the course.

- (1) Pathogenic microorganisms
- (2) Application of microorganisms
- (3) Antimicrobial chemotherapy

2. Course Objectives

Microorganisms are utilizable in our daily lives and in industry. Microorganisms can be model lives for understanding all lives including those of human beings. A large number of valuable antibiotics have been isolated from natural resources so far and used as drugs. This course will provide background knowledge of how antibiotics have been discovered from natural resources and an explanation of why antibiotics exist in nature. You may get an impression from the word "antibiotics" that they are difficult to approach. In fact, they consist of familiar atoms such as hydrogen, carbon, and nitrogen. With a chemical method by which we can carefully observe these atoms, we can learn more about antibiotics.

3. Grading Policy

Students will receive a comprehensive evaluation based on their state of attendance, and their response to a simple assignments related to the lectures given in this class and the results of periodic examinations (reports).

4. Textbook and Reference

Textbook

Teaching material (prints) will be distributed.

5. Requirements(Assignments)

The students who finished organic chemistry, microbiology, biochemistry, and microbial chemistry.

6. Note

7. Schedule

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| [1] | The gram-positive cocci |
| [2] | The gram-positive bacilli (1) |
| [3] | The gram-positive bacilli (2) |
| [4] | The gram-negative cocci |
| [5] | The gram-negative aerobic and anaerobic bacilli (1) |
| [6] | The gram-negative aerobic and anaerobic bacilli (2) |
| [7] | Development history of antimicrobial agents and definition of antibiotics |
| [8] | Application of microorganisms : cultivation, taxonomy and identification |
| [9] | Cell wall synthesis inhibitor (1) : penicillins |
| [10] | Cell wall synthesis inhibitor (2) : cepheems |
| [11] | Cell wall synthesis inhibitor (3) : carbapenems, oxapenems, and monobactams |
| [12] | Cell wall synthesis inhibitor (4) : β -lactamase inhibitors |
| [13] | Protein synthesis inhibitor (1) : aminoglycosides |
| [14] | Protein synthesis inhibitor (2) : tetracyclines |
| [15] | protein synthesis inhibitor (3) : macrolides |