

2026 Akita University Faculty of Medicine Syllabus

Category	: 基礎医学 IV
Course Title	: Basic Pharmacology
Eligible Students	: grade 2 Related Course
Code	: 71563018
Schedule	: week 18 ~ week 23
Credits	: 2

1. Lead Instructor

Kota Saito (Professor, Biological Informatics and Experimental Therapeutics, 6065)

2. Instructors

Kota Saito (Professor, Biological Informatics and Experimental Therapeutics, 6065)

Miharu Maeda (Assistant Professor, Biological Informatics and Experimental Therapeutics, 6067)

3. Course Description Outline(Course Objectives)

Understand the mechanism of action of drugs and poisons on living organisms at the individual, cell, and molecular levels.

Understand the interaction between living organisms and drugs, and learn the basic concept for accurate drug therapy.

(1) Basics of pharmacological action (3-1 3-7,5-1 5-4,6-1 6-2)

1. Draw a concentration-response curve for drugs and toxins and explain the determinants.

2. Explain the quantitative relationship between drug receptor binding and pharmacological actions.

3. Draw a dose-response curve for drugs and toxic substances and explain the relationship between effective, toxic, and lethal dose.

(2) Pharmacokinetics (3-1 3-7,5-1 5-4,6-1 6-2)

1. Explain the absorption, distribution, metabolism and excretion of drugs and toxins.

2. Explain the factors that influence the passage of drugs through biological membranes.

3. List drug administration methods (oral, sublingual, skin, mucous membrane, rectum, injection, inhalation, eye drops, nasal drops, etc.) and explain the pharmacokinetics of each.

(3) Evaluation of drugs (3-1 3-7,4-1 4-7,6-1 6-2)

1. Explain the significance of the placebo effect in drug evaluation.

2. Outline the relationship between drug efficacy and safety and genomic diversity.

(4) Basic principle of drug treatment (1-1,1-2,2-1 2-6,2-8,4-1 4-7,6-1 6-2)

1. Explain the pharmacological actions, indications, adverse events, and precautions for administration of drugs that act on each organ system (central / peripheral nerves, circulatory system, respiratory system, digestive system, renal urinary system, blood, endocrine system, etc.).

2. Explain the pharmacological action, indications, adverse events, and precautions for administration of antimicrobial agents.

(5) Informed consent (1-1,1-2,4-1 4-7,6-1 6-2)

1. Explain the significance and necessity of informed consent and informed assent.

4. Textbook/Reference Books

「カッツング薬理学 エッセンシャル」 丸善出版

「イラストレイテッド薬理学」丸善出版

「新しい薬理学」 西村書店

「FLASH 薬理学」 羊土社

5. Assessment

Unified examination, Formative Assessment, Reports, Attendance

6. Out of Class Study/Message

Pre-lecture preparation and post-lecture review are essential.

Topics and Contents of class, Course Objectives						
	Class Date	Period	Class Format	Topics and Contents of class, Course Objectives	Instructors	Class Room
1	9/2 (Wed)	1-2	Lecture	Theme: Introduction 1. Draw a concentration-response curve for drugs and toxins and explain the determinants. 2. Explain the quantitative relationship between drug receptor binding and pharmacological actions. 3. Draw a dose-response curve for drugs and toxic substances and explain the relationship between effective, toxic, and lethal doses. 4. Explain the significance and necessity of informed consent and informed assent. 5. Explain the significance of the placebo effect in drug evaluation.	Kota Saito	基礎棟第2講義室
2	9/2 (Wed)	3-4	Lecture	Theme: Pharmacokinetics, Drug discovery 1. Explain the absorption, distribution, metabolism and excretion of drugs and toxins. 2. Explain the factors that influence the passage of drugs through biological membranes. 3. List drug administration methods (oral, sublingual, skin, mucous membrane, rectum, injection, inhalation, eye drops, nasal drops, etc.) and explain the pharmacokinetics of each. 4. Outline the relationship between drug efficacy and safety and genomic diversity.	Kota Saito Miharu Maeda	基礎棟第2講義室
3	9/2 (Wed)	5-6	Lecture	Theme: Autonomic Pharmacology Explain the pharmacological actions, indications, adverse events, and precautions for administration of drugs that act on the autonomic nervous system.	Kota Saito	基礎棟第2講義室
4	9/2 (Wed)	7-8	Lecture	Theme: Cholinergic and anticholinergic drugs Explain the pharmacological actions, indications, adverse events, and precautions for administration of cholinergic and anticholinergic drugs.	Kota Saito	基礎棟第2講義室
5	9/2 (Wed)	9-10	Lecture	Theme: Adrenergic and anti-adrenergic drugs Explain the pharmacological actions, indications, adverse events, and precautions for administration of adrenergic and anti-adrenergic drugs.	Kota Saito	基礎棟第2講義室
6	9/9 (Wed)	1-2	Lecture	Theme: Steroids and NSAIDs Explain the pharmacological actions, indications, adverse events, and precautions for administration of steroids and NSAIDs.	Miharu Maeda	基礎棟第2講義室
7	9/9 (Wed)	3-4	Lecture	Theme: Drugs used in Rheumatoid Arthritis, Gout and Opioids Explain the pharmacological actions, indications, adverse events, and precautions for administration of drugs used in Rheumatoid Arthritis, Gout and Opioids.	Miharu Maeda	基礎棟第2講義室
8	9/9 (Wed)	5-6	Lecture	Theme: Hypnotics, schizophrenia drugs, and antidepressants Explain the pharmacological actions, indications, adverse events, and precautions for administration of hypnotics, schizophrenia drugs, and antidepressants.	Miharu Maeda	基礎棟第2講義室

Topics and Contents of class, Course Objectives						
	Class Date	Period	Class Format	Topics and Contents of class, Course Objectives	Instructors	Class Room
9	9/9 (Wed)	7-8	Lecture	Theme: Drugs used in Parkinsonism, Epilepsy and Alzheimer's disease Explain the pharmacological actions, indications, adverse events, and precautions for administration of Parkinson's disease therapeutic agents, epilepsy therapeutic agents, and Alzheimer's disease therapeutic agents.	Kota Saito	基礎棟第2講義室
10	9/9 (Wed)	9-10	Lecture	Theme: Muscle relaxants, local and general anesthetics Explain the pharmacological actions, indications, adverse events, and precautions for administration of muscle relaxants, local and general anesthetics.	Kota Saito	基礎棟第2講義室
11	9/16 (Wed)	1-2	Lecture	Theme: Hypothalamic pituitary gland, thyroid gland, and sex hormone-related drugs. Explain the pharmacological actions, indications, adverse events, and precautions for administration of hypothalamic pituitary gland, thyroid gland, and sex hormone-related drugs.	Miharu Maeda	基礎棟第2講義室
12	9/16 (Wed)	3-4	Lecture	Theme: Antihypertensive drugs and diuretics. Explain the pharmacological actions, indications, adverse events, and precautions for administration of antihypertensive drugs and diuretics.	Kota Saito Miharu Maeda	基礎棟第2講義室
13	9/16 (Wed)	5-6	Lecture	Theme: Antianginal drugs, heart failure drugs, and antiarrhythmic drugs. Explain the pharmacological actions, indications, adverse events, and precautions for administration of antianginal drugs, heart failure drugs, and antiarrhythmic drugs.	Kota Saito Miharu Maeda	基礎棟第2講義室
14	9/16 (Wed)	7-8	Lecture	Theme: Hemostatic and anticoagulant drugs Explain the pharmacological actions, indications, adverse events, and precautions for administration of hemostatic and anticoagulant drugs.	Miharu Maeda	基礎棟第2講義室
15	9/16 (Wed)	7-8	Lecture	Theme: Agents used in anemias Explain the pharmacological actions, indications, adverse events, and precautions for administration of anemia-treatment drugs.	Miharu Maeda	基礎棟第2講義室
16	9/16 (Wed)	9-10	Lecture	Theme: Antidiabetic drugs Explain the pharmacological action, indications, adverse events, and precautions for administration of antidiabetic drugs.	Kota Saito Miharu Maeda	基礎棟第2講義室
17	9/30 (Wed)	1-2	Lecture	Theme: Drugs for treating dyslipidemia and bone metabolism-related drugs Explain the pharmacological actions, indications, adverse events, and precautions for administration of drugs for treating dyslipidemia and bone metabolism-related drugs.	Kota Saito Miharu Maeda	基礎棟第2講義室
18	9/30 (Wed)	3-4	Lecture	Theme: Gastrointestinal ulcer therapeutic agents, laxatives, and antiemetics Explain the pharmacological actions, indications, adverse events, and precautions for administration of gastrointestinal ulcer therapeutic agents, laxatives, and antiemetics.	Kota Saito Miharu Maeda	基礎棟第2講義室

Topics and Contents of class, Course Objectives						
	Class Date	Period	Class Format	Topics and Contents of class, Course Objectives	Instructors	Class Room
19	9 / 30 (Wed)	5-6	Lecture	Theme: Chemotherapy 1 Explain the pharmacological action, indications, adverse events, and precautions for administration of chemotherapeutic agents.	Kota Saito Miharu Maeda	基礎棟第 2 講義室
20	9 / 30 (Wed)	5-6	Lecture	Theme: Chemotherapy 2, Molecular targeted drug Explain the pharmacological actions, indications, adverse events, and precautions for administration of chemotherapeutic drugs and molecular-targeted drugs.	Kota Saito Miharu Maeda	基礎棟第 2 講義室
21	9 / 30 (Wed)	7-8	Lecture	Theme: Antibacterial drug, anti-tuberculosis drug Explain the pharmacological actions, indications, adverse events, and precautions for administration of antibacterial and antituberculosis drugs.	Kota Saito Miharu Maeda	基礎棟第 2 講義室
22	9 / 30 (Wed)	7-8	Lecture	Theme: Antiviral drug, antifungal drug Explain the pharmacological actions, indications, adverse events, and precautions for administration of antiviral drugs and antifungal drugs.	Kota Saito Miharu Maeda	基礎棟第 2 講義室
23	9 / 30 (Wed)	9-10	Lecture	Theme: Allergy treatment drugs and immunosuppressive drugs Explain the pharmacological actions, indications, adverse events, and precautions for administration of allergy treatment drugs and immunosuppressive drugs.	Kota Saito Miharu Maeda	基礎棟第 2 講義室

Topics and Contents of class, Course Objectives						
	Class Date	Period	Class Format	Topics and Contents of class, Course Objectives	Instructors	Class Room
24	10 / 7 (Wed)	1-10	Formative assesment	<p>Theme: Formative Assessment</p> <p>Understand the mechanism of action of drugs and poisons on living organisms at the individual, cell, and molecular levels.</p> <p>Understand the interaction between living organisms and drugs, and learn the basic concept for accurate drug therapy.</p> <p>(1) Basics of pharmacological action</p> <ol style="list-style-type: none"> 1. Draw a concentration-response curve for drugs and toxins and explain the determinants. 2. Explain the quantitative relationship between drug receptor binding and pharmacological actions. 3. Draw a dose-response curve for drugs and toxic substances and explain the relationship between effective, toxic, and lethal dose. <p>(2) Pharmacokinetics</p> <ol style="list-style-type: none"> 1. Explain the absorption, distribution, metabolism and excretion of drugs and toxins. 2. Explain the factors that influence the passage of drugs through biological membranes. 3. List drug administration methods (oral, sublingual, skin, mucous membrane, rectum, injection, inhalation, eye drops, nasal drops, etc.) and explain the pharmacokinetics of each. <p>(3) Evaluation of drugs</p> <ol style="list-style-type: none"> 1. Explain the significance of the placebo effect in drug evaluation. 2. Outline the relationship between drug efficacy and safety and genomic diversity. <p>(4) Basic principle of drug treatment</p> <ol style="list-style-type: none"> 1. Explain the pharmacological actions, indications, adverse events, and precautions for administration of drugs that act on each organ system (central / peripheral nerves, circulatory system, respiratory system, digestive system, renal urinary system, blood, endocrine system, etc.). 2. Explain the pharmacological action, indications, adverse events, and precautions for administration of antimicrobial agents. <p>(5) Informed consent</p> <ol style="list-style-type: none"> 1. Explain the significance and necessity of informed consent and informed assent. 	Kota Saito Miharu Maeda	基礎棟第2 講義室