

科目ナンバリング		U-LAS70 10002 SE50					
授業科目名 <英訳>	ILAS Seminar-E2 :Biochemistry Principles (生化学の塾) ILAS Seminar-E2 :Biochemistry Principles			担当者所属 職名・氏名	医学研究科 講師 Erik WALINDA		
群	少人数群	単位数	2単位	週コマ数	1コマ	授業形態	ゼミナール (対面授業科目)
開講年度・ 開講期	2026・後期	受講定員 (1回生定員)	16 (14) 人	配当学年	主として1回生	対象学生	全学向
曜時限	木5	教室	1共22			使用言語	英語
キーワード	Medical biochemistry-related / Molecular Biology / Chemistry / Physiology / Biochemistry						
[授業の概要・目的]							
This seminar is a chance to explore biochemistry in a more interactive and relaxed way. Instead of just sitting and listening, you will learn through discussions, problem-solving, and small group activities. You can take this seminar by itself, or together with other related lectures if you like - there is no strict connection. The goal is simple: to help you really understand important biochemical ideas, practice applying them, and build confidence in using scientific English. Along the way, we will also look at extra topics that may not come up in regular lectures. In this seminar, you can expect: * Group discussions where we work together on biochemical problems. * Short, ungraded quizzes and other activities for self-check. * Case studies that connect science to real-life examples. * Peer teaching opportunities to learn from and with your classmates. You are always welcome to ask questions - during class, by email, or in extra meetings with me or the teaching assistants. The seminar is conducted entirely in English, giving you a chance to practice scientific communication in a supportive environment. In short: think of this seminar as a study group for biochemistry (生化学の塾), where we focus on understanding, practice, and discussion rather than memorization.							
[到達目標]							
Life science tries to understand everything about living things - from the tiniest atoms all the way up to whole organisms. In this seminar, we focus on how biomolecules (like DNA, proteins, and lipids) are built, how they work, and how they come together to keep life running in both health and disease. By the end of this seminar, you should be able to: * Describe the structure and role of important biomolecules such as DNA, proteins, and lipids. * Understand and explain key biochemical reactions, including enzymes and metabolic pathways. * Practice thinking about how common molecular biology techniques (PCR, cloning, protein analysis) are used. * Discuss how biomolecules affect cell function and the health of the whole organism.							
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[授業計画と内容]

Course Topics

(14 classes + 1 feedback session)

1. Introduction to Biochemistry: What biochemistry is and how molecules make life possible.
2. DNA, Genes, and Genomes: How genetic information is stored and passed on.
3. DNA Replication and Gene Expression: How DNA makes copies and gives instructions for proteins.
4. Proteins: Their shapes and the many jobs they do in cells.
5. Protein Structure: How folding determines protein function.
6. DNA Isolation and Analysis: Basic lab techniques to look at DNA.
7. DNA Cloning and PCR: How scientists copy and work with DNA.
8. Protein Methods: How to study and analyze proteins in the lab.
9. Enzymes: Special proteins that speed up life ' s chemical reactions.
10. Enzyme Kinetics: How to measure and understand enzyme activity.
11. Carbohydrates: Sugars as energy and as building blocks.
12. Lipids: Fats and membranes that organize and power cells.
13. Metabolism: How cells make and use energy.
14. Citric Acid Cycle and Oxidative Phosphorylation: The main energy-producing pathways.

[履修要件]

特になし

[成績評価の方法・観点]

Class Participation (60%)

Your active participation in class is very important. This includes joining discussions, working on exercises, and taking part in short in-class quizzes and activities.

Homework Logbook (40%)

Instead of a final exam, you will keep a learning logbook throughout the course. This homework is hand-written only (no AI-generated answers). Think of it as your personal record of what you learned - where you can write notes, solve problems, and even draw pictures of molecules, pathways, or bacteria.

Most of the logbook (about 70%) will be completed during class as we review and discuss topics together. The remaining part (around 30%) will be homework to finish at home. It ' s fine to talk and team up with classmates for ideas, but please do not simply copy each other ' s work. Your logbook will be checked and graded as part of your evaluation.

[教科書]

Berg, Tymoczko and Stryer 『Biochemistry (any edition)』 (W. H. Freeman and Co.) ISBN:978-1-4292-7635-1

We use the textbook by Berg and Stryer as a basis for this seminar. You are very welcome to read it in either English or Japanese - whichever works best for you -but you do not have to buy it. Copies are available in the library.

To make things easier, I will upload short, condensed handouts each week that summarize the chapters we use. These handouts will guide our class discussions and help you focus on the most important points.

It ' s also completely fine if you use an AI-translation tool to read my English materials in Japanese, as long as the translation helps you understand the meaning correctly.

[授業外学修 (予習 ・ 復習) 等]

To get the most out of this seminar, students should look over the course materials and work on the problem sets before each class. Think of the homework not as a punishment, but as extra practice - a chance to make the new ideas “ stick ” better by writing, drawing, and thinking them through.

At the start of the course, you will receive a clear weekly schedule, along with links to handouts and online resources. These will guide you step by step so you can prepare without stress.

It may help if you already know a little chemistry or biology, but it isn ' t required. You don ' t need to take Introduction to Biochemistry to succeed here. With the notes, textbook chapters, handouts, and videos provided by the instructor, any motivated student can follow along and do well.

[その他 (オフィスアワー 等)]

Office Hours: I am happy to talk with you anytime. Please send me an email first before coming to my office or before setting up an online meeting (Zoom, etc.). Don ' t worry about the reason - whether it ' s about class, the homework, or even if something just feels unclear - I ' m here to help, so please don ' t be shy to contact me.

[主要授業科目 (学部 ・ 学科名)]