

Course number		U-LAS14 20038 LE68					
Course title (and course title in English)	Introduction to Molecular Biotechnology-E2			Instructor's name, job title, and department of affiliation	Graduate School of Medicine Professor,Shohab YOUSSEFIAN		
	Introduction to Molecular Biotechnology-E2						
Group	Natural Sciences			Field(Classification)	Biology(Issues)		
Language of instruction	English			Old group	Group B		Number of credits 2
Number of weekly time blocks	1	Class style	Lecture (Face-to-face course)		Year/semesters	2025 • First semester	
Days and periods	Tue.3		Target year	Mainly 1st & 2nd year students		Eligible students	For science students
[Overview and purpose of the course]							
<p>Molecular Biotechnology is an exciting, evolving and interdisciplinary area of science that is expected to impact not only on the way we live but human life itself. It is being used to produce chemicals, medicines and other products in recombinant bacterial, plant and animal cells; to create transgenic plants that synthesize novel products or are resistant to various stresses, and transgenic animals with increased productivity; and is even being applied to modify humans through gene therapy and regenerative medicine.</p> <p>The course will begin by outlining our current understanding of genomes, DNA and genes and their regulation, will then focus on the concepts behind basic techniques routinely used to isolate and analyse DNA and proteins, will examine how these principles and methodologies are used to generate transgenic organisms, and will finally evaluate the pros and cons of such transgenic applications.</p>							
[Course objectives]							
To appreciate the tremendous potential of molecular biotechnology through a solid understanding of its basic principles, techniques and current applications, and thereby be able to address, from a fully informed point of view, the moral and bioethical issues that arise from the use of such breakthrough technologies.							
[Course schedule and contents)]							
Main Topics: <ol style="list-style-type: none"> 1. Introduction; overview, concepts, development and future 2. Genome organization, DNA and genes 3. Gene expression and regulation 4. Principles and techniques of recombinant DNA technology 5. Molecular techniques for gene identification 6. Molecular techniques of gene analysis 7. Recombinant proteins; synthesis and analysis 8. Methods in microbial molecular biotechnology 9. Applications of microbial molecular biotechnology 10. Methods in plant molecular biotechnology 11. Applications of plant molecular biotechnology 12. Methods in animal, human and medical biotechnology 13. Applications of animal and human molecular genetics 14. Social and ethical issues of molecular biotechnology 15. Final examination 16. Feedback 							
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Introduction to Molecular Biotechnology-E2(2)

[Course requirements]

None

[Evaluation methods and policy]

Evaluation will be based on class attendance and active participation (~20 %), mid-course tests (~30 %) and a final examination (~50 %)

[Textbooks]

Glick, Pasternak and Patten 『Molecular Biotechnology 4th Edition 2009』 (ASM Press) ISBN:978-1-55581-498-4 (Lectures are partially based on this textbook. Few copies are available in Medical School Library)

[References, etc.]

(References, etc.)

Introduced during class

[Study outside of class (preparation and review)]

*Full lecture handouts will be provided one week before each lecture, and will also be uploaded on KULASIS. It is expected that students will have read through the handouts at least once before each lecture to familiarize themselves with the contents. During the lecture, active listening and participation (e.g. by asking questions) will ensure a greater understanding of the basic concepts. Finally, and most importantly, a private review of the handout immediately after the lecture will ensure a full and solid understanding of the lecture concepts

[Other information (office hours, etc.)]

*The course is presented as a series of engaging and active lectures with demonstrations and video presentations.

*Questions and discussions during class are highly encouraged.

*I run an open door policy; questions and discussions will be happily addressed anytime, even outside the official office hour.

[Essential courses]