

Category (科目区分)	Specialized subjects / Basic Medical System		
Course Title (授業科目名)	Forefront of Biotechnology		
Instructors (担当者名)	Yukio Koizumi	Academic Year (配当年次)	1,2
Required Course / Elective Course (必修/選択)	Elective Course	Credits (単位数)	2
Class Format (授業形態)	Lecture		
Schedule (開講期間)	Students will be notified by email after completing the course registration.		
Class Date/Period (開講曜日・時間)	Every Friday 1st, 2nd, 3rd, 4th period (Details of schedule are negotiable)		
Course Outline/ Course Objectives (授業の概要・到達目標)			
Purpose of class: The purpose of the class is to acquire the knowledge of front-line biotechnology in order to understand the latest basic medical research. Achievement goal of the class: The goal is to be able to understand and explain the genome, transcriptome, proteome, metabolome analysis research and bioinformatics research of many organisms including humans. Class Overview: See Class Plan.			
Course Planning (授業計画)			
	Course Outline/ Course Objectives(授業の概要及び到達目標) (Contents of Class) ( (授業内容) )	Instructor (担当教員名)	Department (講座名) Class Room [実施場所]
1	There are many attempts to analyze gene functions comprehensively on the genome scale by decoding genome information and discovering RNA interference, and in combination with the genome editing technologies recently developed, such as CRISPR / Cas9, it is expected that genetic function research will progress from this perspective. In addition, with the development of mass spectrometers, big data on protein-protein interaction have been accumulated, and the overall picture of signal transduction systems and control systems in various contexts is being grasped. Based on this information, attempts to reproduce life phenomena on computers have also begun. In this lecture, we would like to discuss comprehensive analysis, which is the core of post-genome research. In addition, we will mention future prospects.	Professor Yasukazu Hozumi	Department of Cell Biology and Morphology [Zoom]
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6	Advances in genomics are expanding the technological potential of biotechnology. Not only is it possible to elucidate and utilize unknown genes, but it is also possible to synthesize proteins and enzymes with new functions that do not exist in nature, and to create new drugs. Basic biotechnology technologies include bioinformatics (bioinformatics), recombinant DNA technology, protein engineering, and sugar chain engineering. I will explain these latest advances.	Assistant Professor Yukio Koizumi and Jianbo An	Department of Biochemistry and Metabolic Science  Reserch Building for Basic Medicine 4th floor, Seminar room
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Grading Criteria (成績評価の基準と方法)			
The total of 45 hours, consisting of 30 hours of lectures in the seminar room and 15 hours of self-study, counts as one credit. The content of reports, etc. will be evaluated comprehensively.			
Contact Information (問い合わせ先(氏名, メールアドレス等) )			
Name: Yukio Koizumi / E-mail: ykoizumi@med.akita-u.ac.jp			
Coment (その他特記事項)			
The dates for this course will be scheduled after taking this course to encourage attendance of adult graduate students. Textbooks and reference papers will be suggested, if needed. Students are expected to prepare for this course by reading the relevant protocols.			