

Category (科目区分)	Cluster of Metabolism and Information Systems		
Course Title (授業科目名)	Neurotransmission mechanism / experimental practice		
Instructors (担当者名)	Tomohiro Numata	Academic Year (配当年次)	1
Required Course / Elective Course (必修/選択)	Elective Course	Credits (単位数)	1
Class Format (授業形態)	Lecture		
Schedule (開講期間)	Students will be notified by email after the course registration is complete.		
Class Date/Period (開講曜日・時間)	Students will be notified by email after the course registration is complete.		
Course Outline/ Course Objectives (授業の概要・到達目標)			
Class purpose: Understand typical neurophysiological research methods based on basic knowledge as a medical course student.			
Class Achievement Goals: Understand and practice essential neurophysiological research methods.			
Class overview:			
1,2, Animal Behavior Experiments: Learn the knowledge and skills necessary for mouse behavior experiments.			
3,4,5, in vitro experiments: Perform patch-clamp recording of isolated cells and brain slices. Learn how to handle animals, how to prepare samples and the knowledge and techniques that form the basis of electrophysiological research.			
6,7, Brain Cell Signaling: Learn how to record and analyze electrical signals related to brain cells.			
8,9,10, Photo-induced chemical experiment method: Localizes photochemical substances in target cells. Learn how to induce membrane excitement by photoexcitation and conduct electrophysiological research.			
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	Animal behavior experiment	Tomohiro Numata	Department of Integrative Physiology [ Reserch Building for Basic Medicine ]
2	Mouse behavior experiment		
3	In vitro slice patch clamp recording method		
4	In vitro slice patch clamp recording method		
5	In vitro slice patch clamp recording method		
6	Extracellular signal recording		
7	Extracellular signal recording		
8	Photoinducible chemistry experiment		
9	Photoinducible chemistry experiment		
10	Photoinducible chemistry experiment		
Grading Criteria (成績評価の基準と方法)			
Thirty hours of practical training and 15 hours of self-study in the seminar room, a total of 45 hours, will be used for one unit.			
Grades will be considered by attendance, examination results, and reports.			
Contact Information (問い合わせ先(氏名, メールアドレス等))			
Name: Prof. Tomohiro Numata / E-mail: numata@med.akita-u.ac.jp			
Coment (その他特記事項)			
Information about courses: If you cannot attend the training due to work, such as working graduate students, we will adjust the schedule, including remote lectures and discussions.			
We accept participation not only from the medical field but also from a wide range of fields.			
Textbooks / References: Textbooks / References: "Standard Physiology" Igaku-Shoin			