科目ナンバリング	U-LAS14 10017 LE69				
授業科目名<英訳>	Introduction into the Neuroscience of Memory-E2 Introduction into the Neuroscience of Memory-E2	担当者所属職名・氏名	医学研究科　特別招へい教授 Karl Peter Giese		
群	自然科学科目群	分野(分類)	生物学(総論)	使用言語	英語
旧群	B群	単位数	2単位	時間数	30時間	授業形態	講義（対面授業科目）
開講年度・開講期	2026・前期集中	曜時限	集中	配当学年	主として1・2回生	対象学生	理系向

[授業の概要・目的]

The purpose of this course is to introduce the students to neuroscience. The neuroscience of memory will be discussed. The students will learn about the anatomy of the brain and different functions of brain regions. Further, the properties and functions of neurons will be discussed and it will be explained how neurons make and store memories. Finally, it will be discussed how neurons become dysfunctional in Alzheimer's disease, resulting in memory loss.

[到達目標]

The course goals are to develop an understanding of how the nervous system works, how it generates behavior, and to understand what can go wrong in diseases, such as Alzheimer's disease.

[授業計画と内容]

There will be 15 intense lectures, covering the following topics: 1) Introduction into the basics of neuroscience and behavior. Introduces the idea that a mechanistic understanding of behavior can be achieved by studying molecular and cellular, and systems processes in the nervous system. 2) How is the nervous system organized? Explains some connectivities between neurons and other cell types in the brain and introduces the idea that brain areas can act independently. 3) The anatomy of neurons. Discusses how neurons are compartmentalized and introduces different types of neurons in the brain. 4) Signaling within neurons. Explains how neurons generate electrical activity and how this activity can propagate along the neuron. 5) Synaptic transmission. Explains how neurons communicate via synaptic transmission. 6) Synaptic plasticity. Explains how the neurons can change synaptic transmission. 7) Brain anatomy. Discusses the anatomy of particular brain regions which are needed for memory. 8) Understanding memory at the behavioral level. Explains that there are different memory types and discusses how to determine this in behavioral studies with human subjects or in animal models. 9) Brain regions and memory types. Illustrates that different brain regions have different memory functions. 10) The hippocampus and memory 1. Discusses patient H.M. and hippocampal lesion workand the impact on memory. 11) The hippocampus and memory 2. Discusses the discovery of long-term potentiation and place cells in the hippocampus, and illustrates their association with memory. 12) Molecular basis of memory. Discusses molecular processes of formation and the storage of memory. 13) Experimental analysis of memory. Discusses the mechanistic analysis of memory, using experimental approaches. 14) Alzheimer's disease and memory loss. Discusses the causes of memory loss in Alzheimer's disease. 15) Feedback.

[履修要件]

This class is mostly for first year students. Some background in natural sciences is helpful, but not essential.

Introduction into the Neuroscience of Memory-E2(2)へ続く↓↓↓

Introduction into the Neuroscience of Memory-E2(2)

[成績評価の方法・観点]

1-hour exam consisting of short-answer questions.

[教科書]

Luquin Luo 『Principles of Neurobiology』（CRC Press）ISBN:978-0815346050

[授業外学修（予習・復習）等]

Students are expected to read the corresponding section of the text book.

[その他（オフィスアワー等）]

[主要授業科目（学部・学科名）]