科目ナンバリング	U-LAS70 10002 SE50						
授業科目名<英訳>	ILAS Seminar-E2 :Physiological Neuroscience（生理学的神経科学） ILAS Seminar-E2 :Physiological Neuroscience			担当者所属職名・氏名	医学研究科　講師　RAUDZUS, Fabian		
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・前期	受講定員(1回生定員)	25 (15) 人	配当学年	主として1回生	対象学生	全学向
曜時限	水4	教室	共北11			使用言語	英語
キーワード	Brain (脳) / Spinal cord (脊髄) / Neuron (ニューロン) / Neurogenesis (神経発生)						

[授業の概要・目的]

Welcome to the fascinating world of "Physiological Neuroscience"! Have you ever wondered how our incredible brain enables us to think, see, hear, and move? This seminar will unravel the mysteries of our body's ultimate control center.
In our initial sessions, we'll learn about the basic structure of the brain and get to know the building blocks, called neurons. We'll zoom in on these neurons, paying special attention to their membrane proteins like ion channels and receptors. These proteins play an important role in creating electrical signals by establishing ion gradients.
After understanding these essential mechanisms, we'll explore how these signals travel, facilitating communication between neurons. As the course progresses, we'll delve into the brain's development and learn how neurons establish the right connections, like wiring a complex network.
In our final sessions, we'll explore the functions of different brain structures and specialized neurons, allowing us to understand how we perceive the world around us - from seeing and hearing to sensing pain.
Throughout each seminar, you'll not only gain insights into the brain's fundamental properties and functions but also explore disruptions caused by various diseases, medications, substances, or toxins. This knowledge will equip you with valuable tools to comprehend related issues on a deeper level.

Get ready for an engaging journey into the wonders of the brain!

[到達目標]

By the end of this seminar, you'll uncover the fascinating world of neurons and how they communicate. We'll dive into exciting medical and biological aspects of neuroscience, giving you a well-rounded perspective. Plus, you'll gain the skills to engage in stimulating discussions about the latest advancements in the field, regardless of your academic background. This seminar offers an eye-opening journey into the wonders of the brain!

[授業計画と内容]

Tentative Schedule:
1. Introduction to Neuroscience
2+3. What is a Neuron?
4. The Important Role of Ion Channels
5. How Can a Neuron Sense an External Signal? Receptors
6+7. A Matter of Concentration: Ion Gradients and the Membrane Potential
8. Time for Action: The Action Potential
9. Worksharing Within the Neuron: Neuronal Polarity and Subcellular Specialization
10. Neuron Conversations: How Brain Cells Communicate

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11. How is the Message Delivered from One Neuron to the Other? Neurotransmitter
12. The Development of the Brain: Neurogenesis
13. How to Connect the Wires? Axon Guidance and Neuronal Regeneration
14. From Stimulus to Sensation: Eyes, Ears, and Pain Receptors
15. Feedback

Changes in order and/or content might occur.

[履修要件]

The course is open to all students, but a basic understanding of biology is recommended.

[成績評価の方法・観点]

Attendance and active participation: 20%
Midterm assignment: 40%
Presentation: 40%

[教科書]

使用しない

[参考書等]

（参考書）
Mark F. Bear, Barry W. Connors, Michael A. Paradiso 『Neuroscience: Exploring the Brain』（Jones & Bartlett Learning, April 8, 2020）ISBN:9781284211283（Enhanced 4th Edition (English Edition)）
Additional literature and Massive Open Online Courses (MOOCs) will be introduced during the seminars.

[授業外学修（予習・復習）等]

To make the most of each seminar, it's essential to be prepared. This involves reviewing the previous session, working through any questions, and independently studying the upcoming subject. Expect to spend around 60-90 minutes getting ready.

[その他（オフィスアワー等）]

For a deeper understanding of neuroscience, it's advised to attend the "Disorders of the Nervous System" seminar. This will provide additional insights into the field.
If you have further questions, feel free to write me an email.

[主要授業科目（学部・学科名）]