

## Unit Name

Memory Research Unit

## Collaborations

### Term 2 2024 - Ongoing

Masanori Murayama, RIKEN, JAPAN, Use of artificial hibernation to treat Alzheimer disease

Anton Maximov, Scripps Institute, USA, Spine and dendritic morphology of hippocampal engram



Shigeki Watanabe, Johns Hopkins University, USA, Role of microglia for memory retention during hibernation

Silvia Viana da Silva, German Center for Neurodegenerative Diseases, Germany, Optogenetic manipulation of mitochondria

Tomoki Fukai, OIST, JAPAN, Model prediction of epilepsy development

### Term 3 2024 - Ongoing

Matthias Haberl, Universitätsmedizin Berlin, Neuroscience Research Center, Germany, Use of AI models to analyze EM images

Motomasa Tanaka, RIKEN, JAPAN, Use of a novel Alzheimer model for artificial hibernation

### Term 2 2023 - Ongoing

Tomoki Fukai, OIST, JAPAN, Spike sequence detection from the hippocampus

Jun Nagai, RIKEN, JAPAN, manipulation of astrocytes during hibernation

Noriko Horii, Nara Medical University Hospital, JAPAN, Home Security Behavior and Hippocampus

Jiří Týč, Czech Academy of Sciences, Czech Republic, Array Tomography Imaging of genetically labeled spines

Marie Vancová, Czech Academy of Sciences, Czech Republic, Array Tomography Imaging of genetically labeled spines

Ryosuke Enoki, National Institute of Physiological Sciences, JAPAN, 2p-imaging of dendritic spines during hibernation

Taiga Takahashi, Tokyo University of Science, JAPAN, 2p-imaging of dendritic spines during hibernation

Bernd Kuhn, OIST, JAPAN, 2p Ca imaging of astrocyte during hibernation

## Term 2 2022 - Ongoing

Jeff Wickens, OIST, JAPAN, Role of Striatal Interneurons for Social Behavior

Takeshi Sakurai, Tsukuba University, JAPAN, Artificial Hibernation and Memory

Arisa Hirano, Tsukuba University, JAPAN, Artificial Hibernation and Circadian Rhythm

## Term 2 2021 - Ongoing

Jeff Wickens, OIST, JAPAN, Navigational Strategy and Hippocampus

## Term 2 2020 - Ongoing

Thomas McHugh, RIKEN, JAPAN, Hippocampal Representations and Engram Stimulation

Akiko Hayashi-Takagi, RIKEN, JAPAN, Genetic labeling of potentiated spines

## Term 2 2020 - Term 2 2024

Tatsuhiko Hisatsune, The University of Tokyo, JAPAN, Adult born neurons and flexible behavior

## Research Personnel

Jan 2022 - Present	Ai Takahashi, Research Unit Technician
May 2024 - Present	Suteera Viboonayasek, JSPS Researcher Ming-Ching Chiang, Staff Scientist
May 2020 - Aug 2024	Viviane Saito, Postdoctoral Scholar, EMBL Rome
Jan 2020 - Present	Hiroto Ashitomi, Research Unit Technician Damien Mercier, Staff Scientist

## Mentorship / Supervision

May 2024 - Present	Host (RI, SRS, VRS, VS), Jion Tominaga, Research Intern Mentor, Hugo Paul Musset, OIST Student
Jan 2024 - Present	Thesis Supervisor, Tomoka Yoseyama, OIST Student
May 2023 - Present	Mentor, Temma Fujishige, OIST Student
Jan 2022 - Present	Co-Supervisor, Balashwethan S Chockalingam, OIST Student Thesis Supervisor, Yu-Ju Lin, OIST Student Mentor, Sutashu Tomonaga, OIST Student Co-Supervisor, Josefine Reuschenbach, OIST Student
Sep 2021 - Present	Third Committee Member, Konstantinos Tsaridis, OIST Student Mentor, Aleksandra Gavrilova, OIST Student Co-Supervisor, Yuma Kajihara, OIST Student
May 2021 - Present	Co-Supervisor, Mao-Ting Hsu, OIST Student

Jan 2021 - Present      Third Committee Member, Munenori Takaku, OIST Student  
Mentor, Bozena Silic, OIST Student  
Third Committee Member, Shagufta Qamar, OIST Student

Sep 2020 - Present      Mentor, Shannon Reiko Hayashi, OIST Student

Sep 2020 - Aug 2024      Thesis Supervisor, Thato Mary Mokhothu, OIST Student

May 2020 - Present      Thesis Supervisor, Lorena Andreoli, OIST Student

## Scholarly Contributions and Creative Productions

### Book Chapter

Completed/Published

Andreoli, L.; Tanaka, K. What Can Hippocampal Engrams Tell Us About Encoding Spatial Navigation? In *Advances in neurobiology*; 2024; pp 195–214.

<https://pubmed.ncbi.nlm.nih.gov/39008017/>

### Journal Article

Completed/Published

Li, H.; Tamura, R.; Hayashi, D.; Asai, H.; Koga, J.; Ando, S.; Yokota, S.; Kaneko, J.; Sakurai, K.; Sumiyoshi, A.; Yamamoto, T.; Tanaka, K.; McHugh, T. J.; Hisatsune, T. Silencing Dentate Newborn Neurons Alters Excitatory/inhibitory Balance and Impairs Behavioral Inhibition and Flexibility. *Science Advances* **2024**, *10*.

<https://doi.org/10.1126/sciadv.adk4741>

### Patent and Intellectual Property

Completed/Published

Tanaka, K.; Mokhothu, T.; Lin, Y.; Nambu, M. Utilization of a Hibernation-like State in Temporal Lobe Epilepsy. WO2024/004500, 2024.

### Presentation at Conference

Completed/Published

Tanaka, K. Extreme Neuronal Plasticity Retains Memory. *US-Japan Synaptic Plasticity Meeting - Synaptic Basis of Cognition* **2024**.

Tanaka, K. Heterogeneous Representations in the Hippocampus. *Gordon Research Conference - Optogenetics* **2024**.

### Seminars

Completed/Published

Tanaka, K. Hippocampal Memory and Representation - Tsukuba University Neuroscience Seminar Series. **2024**.

## Scholarly Contributions (by Unit Members)

## Term 2 2024

YuJu Lin (presenter), Ai Takahashi, Hiroto Ashitomi, Damien Mercier, Kazumasa Tanaka, Poster Presentation at Conference, Memories protected from extreme neuronal plasticity: Insights from artificial hibernation, Transformative Research Area (A) Annual Symposium at Kobe, Completed/Published

## Term 3 2024

YuJu Lin (presenter), Ai Takahashi, Hiroto Ashitomi, Damien Mercier, Kazumasa Tanaka, Poster Presentation at Conference, Memories protected from extreme neuronal plasticity: Insights from artificial hibernation, Gordon Research Conference - Optogenetics, Completed/Published

## Honors, Awards & Fellowships

- Jan 2021 - Present      Young Scientist Award, 2021, Ministry of Education, Culture, Sports, Science and Technology
- May 2020 - Present      Young Investigator Award, 2020, The Japan Neuroscience Society

## Honors, Awards & Fellowships (by Unit Members)

- Jan 2023 - Present      Yu-Ju Lin, JSPS DC1 Fellowship, 学振奨学金 DC1, 2023, JSPS, 学振奨学金が当ユニットの大学院生Yu-Ju Linに授与されました。
- Jan 2023 - Apr 2024      Thato Mokhothu, JSPS DC2 Fellowship, 学振奨学金 DC2, 2023, JSPS, 学振奨学金が授与されました。
- Jan 2024 - Present      Suteera Viboonayasek, JSPS RPD fellowship, 学振研究員RPD, 2024, JSPS, ステイーラがRPD学振研究員として採用されました。

## External Service

- May 2024 - Aug 2024      Peer Review, Frontiers in Neuroscience
- Jan 2024 - Apr 2024      Peer Review, Communications Biology  
Peer Review, AAAS, Science  
Peer Review, Molecular Brain  
Peer Review, Neuron, Cell Press  
Grant Review, Yamada Foundation
- Jan 2022 - Present      Grant Review, Grant-in-Aid, JSPS
- Sep 2024 - Present      Specialized Investigator, National Institute of Science and Technology Policy (NISTEP)
- May 2023 - Present      Advisor for focused research areas, Center for Research and Development Strategy

## Outreach Activities (by Unit Members)

Jan 2024	Ai Takahashi, Career Talk at Hi-Sci Lab 2025, OIST
Sep 2024	Ai Takahashi, Lecture at Okinawa Engineering High School, Okinawa Engineering High School
	Ai Takahashi, Lecture at Okuma Elementary School, Okuma Elementary School