

Unit Name

Memory Research Unit
Assistant Professor Kazumasa Tanaka

Collaborations

Thomas McHugh, RIKEN, JAPAN, Hippocampal Representations and Engram Stimulation
Akiko Hayashi-Takagi RIKEN JAPAN Genetic labeling of potentiated spines
Jeff Wickens, OIST, JAPAN, Role of Striatal Interneurons for Social Behavior
Takeshi Sakurai, Tsukuba University, JAPAN, Artificial Hibernation and Memory
Jeff Wickens, OIST, JAPAN, Navigational Strategy and Hippocampus
Arisa Hirano Tsukuba University JAPAN Artificial Hibernation and Circadian Rhythm
Ryosuke Enoki, National Institute of Physiological Sciences, JAPAN, 2p-imaging of dendritic spines during hibernation
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
Noriko Horii Nara Medical University Hospital JAPAN Home Security Behavior and Hippocampus
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
Jun Nagai RIKEN JAPAN manipulation of astrocytes during hibernation
Tomoki Fukai OIST JAPAN Spike sequence detection from the hippocampus
Tomoki Fukai OIST JAPAN Model prediction of epilepsy development
Silvia Viana da Silva German Center for Neurodegenerative Diseases Germany Optogenetic manipulation of mitochondria
Anton Maximov Scripps Institute USA Spine and dendritic morphology of hippocampal engram
Masanori Murayama RIKEN JAPAN Use of artificial hibernation to treat Alzheimer disease
Shigeki Watanabe Johns Hopkins University USA Role of microglia for memory retention during hibernation
Motomasa Tanaka RIKEN JAPAN Use of a novel Alzheimer model for artificial hibernation
Matthias Haberl Universitätsmedizin Berlin, Neuroscience Research Center Germany Use of AI models to analyze EM images

Research Personnel

Ming-Ching Chiang, Staff Scientist
Suteera Viboonyasek, JSPS Researcher
Damien Mercier, Staff Scientist
Hiroto Ashitomi, Research Unit Technician
Ai Takahashi, Research Unit Technician
Lorena Andreoli, PhD Student

Yu-Ju Lin, PhD Student

Ines Gallego Landin, Research Intern

Luo-Chu Yang, Research Intern

Runqi Liu, Research Intern

Mizuki OHASHI, Research Intern

Jion Tominaga, Research Intern

Scholarly Contributions and Creative Productions (by Faculty)

Journal Article

1. Hirano A, Takahashi TM, Ashitomi H, Tanaka KZ, Sakurai T.
Circadian rhythms remain temperature compensated during a Q neuron-induced hibernation-like state in mice. *PLoS Biol.* 2026 Apr 15;24(4):e3003475.
2. Hsu, M.-T.; Akamine, Y.; Kurima, K.; Tanaka, K. Z.; Wickens, J. R.
Cholinergic Interneurons of the Dorsomedial Striatum Mediate Winner-Loser Effects on Social Hierarchy Dynamics in Male Mice. *iScience* 2025, 28, 113581.

Presentation at Conference

1. Tanaka, K.
Adaptive Convergence of Hebbian Cell Assembly, Spatial Map, and Hippocampal Engram. *Engrams and Ensembles in Learning and Memory*
2. Tanaka, K.
Pertinent and Adaptive Dynamism of the Memory System in the Brain. *Hibernation Biology 2.0 Annual Meeting 2025*
3. Tanaka, K.
Pertinent and Adaptive Dynamism of the Memory System in the Brain. *2025 Taiwan-Japan Neuroscience Exchange Workshop, Japan Neuroscience Society Annual Meeting 2025*
4. Tanaka, K.
Extreme plasticity of the brain reveals a novel role of the astrocyte in memory. *Japan Society for Neurochemistry Annual Meeting 2025*
5. Tanaka, K.
Extreme Plasticity of the Brain Reveals a Novel Role of the Astrocyte in Memory. *Japan Society for Neurochemistry Annual Meeting 2025.*
6. Tanaka, K.
Artificial Hibernation Uncovers Engram Architecture for Memory Retention. *Hibernation Biology International Conference 2025 Tokyo 2025.*

Seminars

1. Tanaka, K.
Hippocampal Memory and Representation. *OIST Computational Neuroscience Courses 2025.*
2. Tanaka, K.
How does the brain represent memory? *Hibernation Biology Lecture Series*
3. Tanaka, K.
Pertinent and Adaptive Dynamism of the Memory System in the Brain. *48th ExCELLS Seminar at National Institute of Physiological Sciences.*

Scholarly Contributions (by Unit Members)

Name of Unit Member	Type	Title	Outlet	Publisher	Year Pub
Ai Takahashi-Nakazato	Journal Article	Direct cryo-EM visualization of the β -sheet structure in curved amyloid protofibril	Biochim Biophys Acta Proteins Proteom .	Elsevier	2026
YuJu Lin (Presenter), Ai Takahashi-Nakazato, Kazumasa Tanaka	Poster Presentation at Conference	Resilient Memory During Artificial Hibernation-Induced Dendritic Remodeling in the Hippocampus	Hibernation Biology International Conference 2025 Tokyo		2025
Luo-Chu Yang (presenter), Ai Takahashi-Nakazato, Yu-Ju Lin, Mizuki Ohashi, Kazumasa Tanaka	Poster Presentation at Conference	Decoding astrocyte plasticity in QIH: structural and functional mechanisms of memory retention	Hibernation Biology International Conference 2025 Tokyo		2025

Honors, Awards & Fellowships [By Unit Members Only]

Term 2 2024 - Ongoing	Suteera Viboonyasek, JSPS RPD fellowship, 学振研究員 RPD, 2024, JSPS, ステイアラが RPD 学振研究員として採用されました。 [Fiscal Year: 2024]
Term 2 2023 - Ongoing	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。 [Fiscal Year: 2024]

Other Institutional Service

Term 1 2025 - Term 1 2025	NHK TV Program "Science Zero", Featured Scientist, (University) [Fiscal Year: 2025]
Term 3 2025 - Term 3 2025	RBCi Radio "Okinawa Economy", Interviewee, (University) [Fiscal Year: 2025]
Term 3 2022 - Ongoing	OIST Computational Neuroscience Course (OCNC), Lecturer, (University) [Fiscal Year: 2022]
Term 2 2020 - Ongoing	Executive Faculty Organizer, OIST Neuroscience Club, (University) [Fiscal Year: 2024]

Workshops and Seminars [Organized and Hosted by Faculty/Units]

Speaker Name(s)	Title	Location	Date
Tsuyoshi Matsuda, Hiroshi Yamaguchi, Hiroaki Norimoto, Tomoya Nakayama, Masatomo Watanabe, Shinjiro Hino, Daisuke Tsukamoto, Genshiro Sunagawa, Shingo Kasamatsu, Akari Yamauchi, Yuko Okamatsu, Atsushi Kuhara, Yoshifumi Yamaguchi, Akira Murakami, Ryosuke Enoki, Naohiro Kon, Shinya Kuroda, Makoto Tominaga, Eiko Iwakoshi, Mitsunori Miyazaki, Arisa Hirano, Daisuke Ono, Kazunobu Sawamoto, Kazumasa Tanaka, Tomoyoshi Soga, Naoki Furutani, Gen Kurosawa, Kazunari Miyamichi, Hiroshi Kiyonari, Yuichi Takeuchi, Takeshi Sakurai, Kaoru Inokuchi, Masato Umeda, Yoshitaka Fukada	Annual Symposium of Hibernation Biology 2.0	OIST Seaside House	2024