Curriculum Vitae

Name/Position: **Mayu Takahashi, MD, PhD**

Professor
Department of Physiology,
Graduate School of Medicine,
Tohoku University

Address: 2-1, Seiryo-machi, Aoba-ku, Sendai, Miyagi, Japan, 980-8575
Email: mayu.takahashi.a5@tohoku.ac.jp

Education:

2000 - 2005	**MD-PhD course, Medical School (the first to 5 th year)**
	Tokyo Medical and Dental University (Japan)
2005 - 2008	**Received PhD, Neurophysiology (Mentor: Yoshikazu Shinoda)**
	Tokyo Medical and Dental University (Japan)
2008 - 2009	**Returned to Medical School for the sixth (last) year**
2009	Graduated Medical School and **received MD**
	Tokyo Medical and Dental University (Japan)
	Passed the national examination for medical doctor
	(License No. 480727)

Professional and Academic Appointments:

2006.4 - 2008.3	Research Fellow (DC-1) for Japan Society for Promotion of Science
2009.4 - 2010.3	Internship in University Hospital,
	Tokyo Medical and Dental University (Japan)
2010.4 - 2021.3	Assistant Professor, Dept. of Systems Neurophysiology
	(Prof. Izumi Sugihara),
	Graduate School of Medicine, Tokyo Medical and Dental University
2021.4 - 2024.3	Junior Associate Professor (ditto)
2024.4 - 2025.3	Associate Professor, Dept. of Neuroanatomy and Cellular Neurobiology
	Graduate School of Medicine, Tokyo Medical and Dental University
2024.4 - 2024.9	Associate Professor, Dept. of Physiology (Prof. Kenichi Ohki),
	Graduate School of Medicine, The University of Tokyo
2024.10 - present	Professor, Dept. of Physiology,
	Graduate School of Medicine, Tohoku University

Awards and Fellowships:

1. 2022 The Japanese Neuro-ophthalmology Society's Academic Award
2. 2017 TMDU President Research Award for Excellent Scientists
3. 2014 TMDU President Research Award for Excellent Scientists
4. 2006 - 2008 Japan Society for the Promotion of Science (JSPS)
   Research Fellowship for Young Scientists (DC-1)
5. 2006 Best Research Award of International Neuro-Ophthalmology Society,
   XVI International Neuro- Ophthalmology Society Meeting, 2006, Tokyo.

Research Grants:

1. 2025 JSPS Grant-in-Aid for Scientific Research (B)
2. 2025 Nakajima Foundation Research Grant
3. 2024 Takeda Science Medical Research Grant
4. 2024 - 2027 AMED Grant
5. 2023 Yamada Science Foundation Research Grant
6. 2022 Takeda Science Medical Research Grant
7. 2020 - 2027 JST FOREST Grant
8. 2019 - 2021 JSPS Grant-in-Aid for Scientific Research (C)
9. 2019 - 2021 The Naito Foundation Research Grant
10. 2019 Brain Science Foundation Grant
11. 2016 - 2018 JSPS Grant-in-Aid for Young Scientists (B)
12. 2015 - 2016 JSPS Grant-in-Aid for Scientific Research on Innovative Areas from MEXT (Adaptative Circuit Shift)
13. 2013 The Nakajima Foundation Research Grant
14. 2011 - 2013 JSPS Grant-in-Aid for Young Scientists (B)
15. 2011 The Uehara Memorial Foundation Research Grant

Professional Affiliations:

The Society for Neuroscience
The International Union of Physiological Sciences
The Barany Society
The Society of the Neural Control of Movement
The Japan Neuroscience Society
The Japan Physiological Society
The Japan Society for Cerebellum and its Disorders
The Japanese Neuro-ophthalmology Society
The Japan Equilibrium Research Society

List of Publications: (Mayu Takahashi)

1. **Takahashi M**, Sugiuchi Y, Shinoda Y. Brainstem neural circuits for triggering vertical saccades and fixation. ***J. Neuroscience*** 44(1): e1657232023, 2024.
2. **Takahashi M**, Sugiuchi Y, Na J, Shinoda Y. Brainstem neural circuits triggering saccades and fixation. ***J. Neuroscience*****,** 42: 789-803, 2022.
3. **Takahashi M**, Sugiuchi Y, Shinoda Y. Neural substrates for generation of oblique saccades. ***Equilibrium Research*** 81: 67-78, 2022.
4. **Takahashi M**, Morphological and electrophysiological characteristics of the commissural system in the superior colliculi for control of eye movements. ***Prog. Brain Res.*** 249: 105-115, 2019.
5. Shinoda Y, **Takahashi M**, Sugiuchi Y. Brainstem neural circuits for fixation and generation of saccadic eye movements. ***Prog. Brain Res.*** 249: 95-104, 2019.
6. Luo Y, Fujita F, Nedelescu H, Biswas MS, Sato C, Ying S, **Takahashi M,** Akita K, Higashi T, Aoki I, Sugihara I. Lobular homology in cerebellar hemispheres of humans, non-human primates and rodents: a structural, axon tracing and molecular expression analysis. ***Brain Structure and Function*** 222: 2449-2472, 2017.
7. **Takahashi M**, Sugiuchi Y, Shinoda Y. Convergent synaptic inputs from the caudal fastigial nucleus and the superior colliculus onto pontine and pontomedullary reticulospinal neurons. ***J. Neurophysiology*** 111: 849-867, 2014.
8. Sugiuchi Y, **Takahashi M**, Shinoda Y. Input-output organization of inhibitory neurons in the interstitial nucleus of Cajal projecting to the contralateral trochlear and oculomotor nucleus. ***J. Neurophysiology*** 110: 640-657, 2013.
9. **Takahashi M**, Sugiuchi Y, Shinoda Y. Commissural inhibition between bilateral superior colliculi for saccades and bilateral vestibular nuclei for vestibulo-ocular reflex (VOR). ***Ann. N.Y. Acad. Sci.*** suppl. 1233: 152-174, 2011.
10. Sugiuchi Y, **Takahashi M**, Izawa Y, Shinoda Y. Input-output organization of inhibitory burst neurons in the interstitial nucleus of Cajal. ***Ann. N.Y. Acad. Sci.*** suppl. 1233: 133-151, 2011.
11. Shinoda Y, Sugiuchi Y, **Takahashi M**, Izawa Y. Neural substrate for suppression of omnipause neurons at the onset of saccades. ***Ann. N.Y. Acad. Sci.*** 1233: 100-106, 2011.
12. **Takahashi M**, Sugiuchi Y, Shinoda Y. Topographic organization of excitatory and inhibitory commissural connections in the superior colliculi and their functional roles in saccade generation. ***J. Neurophysiology*** 104: 3146-3167, 2010.
13. Shinoda Y, Sugiuchi Y, Izawa Y, **Takahashi M**. Neural circuits for triggering saccades in the brainstem. ***Prog. Brain Res.*** 171: 79-85, 2008.

14. Sugiuchi Y, Izawa Y, **Takahashi M,** Na J, Shinoda Y. Controversy on "Fixation Zone" of the Superior Colliculus. ***Neuro-Ophthalmology*** 31: 147-155, 2007.
15. **Takahashi M**, Sugiuchi Y, Shinoda Y. Commissural mirror- symmetric excitation and reciprocal inhibition between the two superior colliculi and their roles in vertical and horizontal eye movements. ***J. Neurophysiology*** 98:2664-2682, 2007.
16. **Takahashi M**, Sugiuchi Y, Izawa Y, Shinoda Y. Commissural excitation and inhibition by the superior colliculus in tectoreticular neurons projecting to omnipause neuron and inhibitory burst neuron regions. ***J. Neurophysiology*** 94:1707-1726, 2005.
17. **Takahashi M**, Sugiuchi Y, Izawa Y, Shinoda Y. Synaptic inputs and their pathways from fixation and saccade zones of the SC to inhibitory burst neurons. ***Ann. N.Y. Acad. Sci.*** 1039: 209-219, 2005.
18. Sugiuchi Y, Izawa Y, **Takahashi M**, Na J, Shinoda Y. Physiological characterization of synaptic inputs to inhibitory burst neurons from the rostral and caudal SC. ***J. Neurophysiology*** 93: 697-712, 2005.

Review Articles:

1. Veale R, **Takahashi M**. Pathways for naturalistic looking behavior in primate. II. Superior Colliculus Integrates Parallel Top-down and Bottom-up Inputs. ***Neuroscience*** 545: 86-110, 2024.
2. **Takahashi M**, Veale R. Pathways for naturalistic looking behavior in primate I: Behavioral characteristics and brainstem circuits. (Forefront Review) ***Neuroscience*** 532: 133-163, 2023.
3. **Takahashi M,** Shinoda Y. Neural circuits of inputs and outputs of the cerebellar cortex and nuclei. ***Neuroscience*** 462: 70-88, 2021.
4. **Takahashi M,** Shinoda Y. Fastigial Nucleus Input/Output related to Motor Control. ***Cerebellum as a CNS Hub*** (eds. H. Mizusawa and S. Kakei**)** pp. 199-237**,** Springer Nature Switzerland, 2021.
5. **Takahashi M**, Shinoda Y. Brain stem neural circuits for horizontal and vertical saccade systems and their frame of reference. (Forefront Review) ***Neuroscienc*e** 392: 281-328, 2018.

Invited speakers at international scientific symposia

1. **Takahashi M**. Brainstem Neural Circuits for Horizontal and Vertical Saccades: Reconciling 3D VOR Coordinate with 2D Saccade Control Mechanisms. **Johns Hopkins University School of Medicine Department of Neurology-Division of Neuro-Visual & Vestibular Disorders (NVV), weekly lecture**, 2025. 3.14, ***Online***.

2. **Takahashi M**. Neural circuits for initiation of voluntary saccadic eye movements and attentive visual fixation. **6th UK-Japan Neuroscience Symposium**, 2025. 1. 25, ***Awaji, Japan***.
3. **Takahashi M**. Brainstem Neural Circuits for Horizontal and Vertical Saccades: Reconciling 3D VOR Coordinates with 2D Saccade Control Mechanisms. **Center for Hearing and Balance Seminar Series**, 2025. 1. 14, ***Johns Hopkins, MD, USA***.
4. **Takahashi M**. Neural circuits for Attentive Fixation and its Relation to Saccade Trigger. **Reward, Motivation, and Beyond: Neural Basis of Communication, Part 2**, 2024. 10. 13, ***Sendai, Japan***.
5. **Takahashi M**. Neurophysiology of quick and slow phase eye movements. **The 32nd Bárány Society meeting**, 2024. 08. 24, ***Uppsala, Sweden***.
6. **Takahashi M**. Neural circuits for triggering saccadic eye movements by inhibiting eye fixation circuits. **International Symposium on Brain Structure and Function**, 2024. 07. 01, ***Okazaki, Japan***.
7. **Takahashi M**. Saccade Trigger Brainstem Circuit - Identification of Inhibitory Neuron for Stopping OPN Activity at the Onset of and during Saccades. **CIN-NIPS-Asia Pacific Systems Neuroscience Symposium**, 2023. 03. 11, ***Tübingen, Germany***.
8. **Takahashi M.** Brainstem neural circuits for saccades. **Johns Hopkins Cerebellum Seminars (organized by Reza Shadmehr)**, 2022. 08, ***Online***.
9. **Takahashi M.** Neural circuits suppressing brain omnipause neuron activity and triggering saccadic eye movements. **Neural Control of Movement in honor of Mike King**, 2022. 07, ***Dublin, Ireland***.
10. **Takahashi M.** New perspectives on the role of the superior colliculus in visually-guided motor behavior. **Panel symposium organizer, The 29th Neural Control of Movements**, 2019. 04, ***Toyama, Japan.***
11. **Takahashi M.** Brainstem neural circuits for saccadic eye movements and their frame of reference. **Symposium organizer (T. Isa, M. Takahashi, K. Cullen), The Kyoto Symposium on the Eye and Head Movement Control Systems, Pre NCM meeting**, 2019. 04, ***Kyoto, Japan***.
12. **Takahashi M.** Input-output organization of posterior vermal and fastigial regions in relation to saccadic eye and head movements. **The 75th Fujiwara Seminar on "Cerebellum as a CNS hub" in honor of Masao Ito**, 2018. 12, ***Tokyo, Japan*.**
13. **Takahashi M.** Brainstem Neural Circuits for Horizontal and Vertical Saccadic Eye movements and their Frame of Reference. **Mathematical Modeling in Motor Neuroscience**, 2018. 06, ***Pavia, Italy*.**

14. **Takahashi M.** Functional roles of commissural connections between the superior colliculi. **Seminars on neural basis of motor control in honor of David Robinson**, 2017. 05, ***Johns Hopkins, MD, USA*.**
15. **Takahashi M.** Neural implementation of Listing's law in the saccade system. **The 24th Annual Meeting of Neural Control of Movement**, 2014. 04, ***Amsterdam, The Netherlands***.
16. **Takahashi M.** Properties and significant roles of commissural connections between the superior colliculi for vertical saccades in relation to the vestibuloocular system and Listing's Law. **Invited Speaker, Gordon Research Conference on "Eye Movements"**, 2013. 07, ***Easton, MA, USA***.
17. **Takahashi M.** Functional roles of commissural inhibition and excitation between the superior colliculi for control of saccades in relation to Listing's law and the VOR. **The 22nd Annual Meeting of Neural Control of Movement**, 2012. 04, ***Venice, Italy***.
18. **Takahashi M.** Neural Circuit for Generation of Vertical Saccades –Role of Commissural Excitation and Inhibition in the Superior Colliculi–. **Symposium on "Advances in Oculomotor and Vestibular Systems" in honor of Prof. E. Keller**, 2010. 04, ***Florida, USA***.
19. **Takahashi M.** Commissural mirror symmetric excitation and reciprocal inhibition between the two superior colliculi and their morphological correlates. "**Neural mechanisms in control eye, head and limb movements, Satellite Symposium to the XXV Bárány Society Meeting**, 2008. 03, ***Ohtsu, Japan***.
20. **Takahashi M.** Functional roles of commissural connections between the superior colliculi for control of saccades. **Satellite symposium on "Neural basis of motor learning and performance" to the 17th Annual Meeting of Neural Control of Movements**, 2007. 03, ***Carmona, Spain***.
21. **Takahashi M.** Synaptic inputs and their pathways from fixation and saccade areas of the Superior Colliculus to Inhibitory Burst Neurons. **"Clinical and Basic Ocular Motor Research", Meeting in Honor of David S. Zee, Satellite to the XXIII Meeting of the Bárány Society**, 2004. 07, ***Siena, Italy***.

Oral presentations at selected international conferences

1. **Takahashi M**, Y Sugiuchi, Y Shinoda, The semicircular canal coordinate system and its relation to neural circuits for saccades. **30th Barany Society Meeting**, 2018. 06, ***Uppsala, Sweden***.

2. **Takahashi M**, Y Sugiuchi, Y Shinoda, Functional roles of tectal commissural inhibition and excitation for generation of horizontal and vertical saccades. **Gordon Research Conference on "Eye Movements"**, 2017. 07, ***Lewistion, ME, USA***.
3. **Takahashi M**, Y Sugiuchi, Y Shinoda, Tectal commissural connections and their functional role of vertical saccades in relation to Listing's law and VOR. **29th Barany Society Meeting**, 2016. 06, ***Seoul, Korea***.
4. **Takahashi M**, Y Sugiuchi, Y Shinoda, Functional roles of tectal commissural inhibition and excitation of horizontal and vertical saccades. **Gordon Research Conference on "Eye Movements"**, 2011. 07 - 08, ***Biddeford, ME, USA***.
5. **Takahashi M**, Y Sugiuchi, Y Shinoda, Functional roles of commissural mirror-symmetric excitatory and reciprocal inhibitory connections between the superior colliculi for control of vertical saccades. **25th Barany Society Meeting**, 2008. 03, ***Kyoto, Japan***.
6. **Takahashi M**, Y Sugiuchi, Y Shinoda, Commissural mirror-symmetric excitation and reciprocal inhibition between the superior colliculi for vertical and horizontal eye movements. **Gordon Research Conference on "Eye Movements"**, 2007. 07, ***Lewiston, ME, USA***.
7. **Takahashi M**, Y Sugiuchi, Y Shinoda, Commissural excitation and inhibition of tectoreticular neurons in the fixation and saccade zones of the SC. **Gordon Research Conference on "Eye Movements"**, 2005. 06 - 07, ***Lewiston, ME, USA***.
8. **Takahashi M**, Y Sugiuchi, Y Shinoda, Synaptic inputs and their pathways from the fixation and saccade areas of the superior colliculus to inhibitory burst neurons. **23rd Barany Society Meeting**, 2004. 07, ***Paris, France***.

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