Curriculum Vitae

Takayuki Yamashita
May 2025

Current Position

Full Professor

Current Affiliation

Department of Physiology II, School of Medicine, Fujita Health University
Department of Neurophysiology, Graduate School of Medicine, Fujita Health University
Division of Neurophysiology, International Center for Brain Science (ICBS), Fujita Health University

Education

2001 The University of Tokyo, B.S., Applied Life Science
2003 The University of Tokyo, M.Sc., Medical Science
2007 The University of Tokyo, Ph.D., Neurophysiology

Academic Positions

2007 – 2009 Postdoctoral Research Fellow, Okinawa Institute of Science and Technology
2009 – 2010 Group Leader, Okinawa Institute of Science and Technology
2010 – 2015 Postdoctoral Research Fellow, École Polytechnique Fédérale de Lausanne
2015 – 2017 Assistant Professor, Nagoya University
2017 – 2020 Associate Professor, Nagoya University
2020 – present Professor, Fujita Health University

Awards and Honors

2004 Research Fellowship for Young Scientists (Japan Society for the Promotion of Science)
2008 Travel Award (Japan Neuroscience Society)
2011 Overseas Research Fellowship (Japan Society for the Promotion of Science)
2011 Young Investigator Award (Japan Neuroscience Society)
2011 Promotion Award (The Physiological Society of Japan)
2017 Young Scientists' Prize (Ministry of Education, Culture, Sports, Science and Technology)
2022 Fujita Industry-Academia Collaboration Promotion Award (Fujita Health University)

Research Interests

- Neurophysiology: sensorimotor processing, reward processing, learning
- Behavior: facial expressions, tactile preference, social behavior
- Neuropsychiatric disease: autism, Alzheimer's disease, bipolar disorder
- Technical innovation: optogenetics, electrophysiology

Peer-reviewed Research Article (#, corresponding author; *, co-first author)

Yoichi Saito, Mitsuru Ishikawa, Mahito Ohkuma, Jonathan Moody, Yo Mabuchi, Tsukasa Sanosaka, Yoshinari Ando, Takayuki Yamashita, Chung-Chau Hon, Jay W. Shin, Wado Akamatsu, Hideyuki Okano. NEUROD1 efficiently converts peripheral blood cells into neurons with partial reprogramming by pluripotency factors. ***Proceedings of the National Academy of Sciences of the United States of America*** 122: e2401387122, 2025.

Mercedes Hildebrandt, Masanori Koshimizu, Yasuki Asada, Kansai Fukumitsu, Mahito Ohkuma, Na Sang, Takashi Nakano, Toshiaki Kunikata, Kai Okazaki, Noriaki Kawaguchi, Takayuki Yanagida, Linyuan Lian, Jianbing Zhang, and Takayuki Yamashita#. Comparative validation of scintillator materials for X-ray-mediated neuronal control in the deep brain. ***International Journal of Molecular Sciences*** 25: 11365, 2024.

Yasuhiro Funahashi, Rijwan Uddin Ahammad, Xinjian Zhang, Emran Hossen, Masahiro Kawatani, Shinichi Nakamuta, Akira Yoshimi, Minhua Wu, Huanhuan Wang, Mengya Wu, Xu Li, Md. Omar Faruk, Md. Hasanuzzaman Shohag, You-Hsin Lin, Daisuke Tsuboi, Tomoki Nishioka, Keisuke Kuroda, Mutsuki Amano, Yukihiko Noda, Kiyofumi Yamada, Kenji Sakimura, Taku Nagai, Takayuki Yamashita, Shigeo Uchino, Kozo Kaibuchi. Signal flow in the NMDA receptor-dependent phosphoproteome regulates postsynaptic assembly for aversive learning. ***Science Signaling*** 17: eado9852, 2024.

Yusuke Fujioka, Kaori Kawai, Kuniyuki Endo, Minaka Ishibashi, Nobuyuki Iwade, Dilina Tuerde, Kozo Kaibuchi, Takayuki Yamashita, Akihiro Yamanaka, Masahisa Katsuno, Hirohisa Watanabe, Gen Sobue, Shinsuke Ishigaki. Stress-impaired reward pathway promotes distinct feeding behavior patterns. ***Frontiers in Neuroscience*** 18:1349366, 2024.

Masahiro Kawatani, Kayo Horio, Mahito Ohkuma, Wan-Ru Li, and Takayuki Yamashita#. Interareal synaptic inputs underlying whisking-related activity in the primary somatosensory barrel cortex. ***The Journal of Neuroscience***, 44: e1148232023, 2024.

Wan-Ru Li, Takashi Nakano, Kohta Mizutani, Takanori Matsubara, Masahiro Kawatani, Yasutaka Mukai, Teruko Danjo, Hikaru Ito, Hidenori Aizawa, Akihiro Yamanaka, Carl C. H. Petersen, Junichiro Yoshimoto#, and Takayuki Yamashita#. Neural mechanisms underlying uninstructed orofacial movements during reward-based learning behaviors. ***Current Biology***, 33: 3436–3451, 2023.

Masahiro Kawatani, William C. de Groat, Keiichi Itoi, Katsuya Uchida, Kenji Sakimura, Akihiro Yamanaka, Takayuki Yamashita, and Masahito Kawatani. Downstream projection of Barrington's nucleus to the spinal cord in mice. ***Journal of Neurophysiology*** 126: 1959–1977, 2021.

Takanori Matsubara and Takayuki Yamashita#. Remote optogenetics using up/down-conversion phosphors. ***Frontiers in Molecular Biosciences*** 8: 771717, 2021.

Takanori Matsubara, Takayuki Yanagida, Noriaki Kawaguchi, Takashi Nakano, Junichiro Yoshimoto, Maiko Sezaki, Hitoshi Takizawa, Satoshi P. Tsunoda, Shin-ichiro Horigane, Shuhei Ueda, Sayaka Takemoto-Kimura, Hideki Kandori, Akihiro Yamanaka, and Takayuki Yamashita#.

Remote control of neural function using X-ray-induced scintillation. ***Nature Communications*** 12:4478, 2021.

Han-Ying Wang, Kohgaku Eguchi, Takayuki Yamashita, and Tomoyuki Takahashi. Frequency-dependent block of excitatory neurotransmission by isoflurane via dual presynaptic mechanisms. ***The Journal of Neuroscience*** 40, 4103-4115, 2020.

Takayuki Yamashita*, Angeliki Vavladeli*, Aurélie Pala*, Katia Galan*, Sylvain Crochet, Sara S.A. Petersen, and Carl C.H. Petersen. Diverse long-range axonal projections of excitatory layer 2/3 neurons in mouse barrel cortex. ***Frontiers in Neuroanatomy*** 12, 33, 2018.

Takayuki Yamashita, and Akihiro Yamanaka. Lateral hypothalamic circuits for sleep-wake control. ***Current Opinion in Neurobiology*** 44, 94-100, 2017.

Takayuki Yamashita#, and Carl C.H. Petersen#. Target-specific membrane potential dynamics of neocortical projection neurons during goal-directed behavior. ***eLife*** 5, e15798, 2016.

Shoko Hososhima, Hideya Yuasa, Toru Ishizuka, Mohammad R. Hoque, Takayuki Yamashita, Akihiro Yamanaka, Eriko Sugano, Hiroshi Tomita, and Hiromu Yawo. Near-infrared (NIR) up-conversion optogenetics. ***Scientific Reports*** 16533, 2015.

Takayuki Yamashita#, Aurélie Pala, Leticia Pedrido, Yves Kremer, Egbert Welker, and Carl C.H. Petersen #. Membrane potential dynamics of neocortical projection neurons driving target-specific signals. ***Neuron*** 80, 1477-1490, 2013.

Takayuki Yamashita#. Ca^{2+}-dependent regulation of synaptic vesicle endocytosis. ***Neuroscience Research*** 73, 1-7, 2012.

Takayuki Yamashita#, Kohgaku Eguchi, Naoto Saitoh, Henrique von Gersdorff, and Tomoyuki Takahashi#. Developmental shift to a mechanism of synaptic vesicle endocytosis requiring Ca^{2+} nanodomain. ***Nature Neuroscience*** 13, 838-844, 2010.

Hiroyasu Watanabe, Takayuki Yamashita, Naoto Saitoh, Shigeki Kiyonaka, Akihiro Iwamatsu, Kevin P. Campbell, Yasuo Mori, and Tomoyuki Takahashi. Involvement of Ca^{2+} channel synprint site in synaptic vesicle endocytosis. ***The Journal of Neuroscience*** 30, 655-660, 2010.

Takayuki Yamashita, Takeshi Kanda, Kohgaku Eguchi, and Tomoyuki Takahashi. Vesicular glutamate filling and AMPA receptor occupancy at the calyx of Held synapse of immature rats. ***The Journal of Physiology (London)*** 587, 2327-2339, 2009.

Maki Koike-Tani, Takeshi Kanda, Naoto Saitoh, Takayuki Yamashita, and Tomoyuki Takahashi. Involvement of AMPA receptor desensitization in short-term synaptic depression at the calyx of Held in developing rats. ***The Journal of Physiology (London)*** 586, 2263-2275, 2008.

Takeshi Nakamura*, Takayuki Yamashita*, Naoto Saitoh, and Tomoyuki Takahashi. Developmental changes in calcium/calmodulin-dependent inactivation of calcium currents at the rat calyx of Held. ***The Journal of Physiology (London)*** 586, 2253-2261, 2008.

Takayuki Yamashita, Toshihide Hige, and Tomoyuki Takahashi. Vesicle endocytosis requires dynamin-dependent GTP hydrolysis at a fast CNS synapse. ***Science*** 307, 124-127, 2005.

Takayuki Yamashita, Taro Ishikawa, and Tomoyuki Takahashi. Developmental increase in vesicular glutamate content does not cause AMPA receptor saturation at the calyx of Held synapse. ***The Journal of Neuroscience*** 23, 3633-3638, 2003.

Naohisa Miyakawa, Shigeo Uchino, Takayuki Yamashita, Hidetsugu Okada, Takeshi Nakamura, Shuichi Kaminogawa, Yusei Miyamoto, and Tatsuhiro Hisatsune. A glycine receptor antagonist, strychnine, blocked NMDA receptor activation in the neonatal mouse neocortex. ***Neuroreport*** 13, 1667-1673, 2002.

Book chapter

Kawatani M, Yamashita T#. In vivo whole-cell recording from the mouse brain. Methods in Molecular Biology 2794:245-257, 2024. Chapter 12 in in "Cerebral Cortex Development: Methods and Protocols" pp.245-257, Edited by Koh-ichi Nagata. Published by Springer, 2024.

Takahashi T, Hori T, Nakamura Y, Yamashita T. Patch clamp recording method in slices for studying presynaptic mechanisms. Chapter 8 in "Patch Clamp Techniques: From Beginning To Advanced Protocols". Edited by Yasunobu Okada. Published by Springer, 2012.

Research article/book chapter in Japanese

松原崇紀、山下　貴之（2022）「X 線を用いた細胞機能の遠隔光操作」生物工学会誌, 100(8) 437-440

山下　貴之（2020）「脳深部の遠隔的光操作法」月刊「細胞」, 52,　63-66.

山下　貴之（2018）「投射ニューロンに着目した大脳皮質神経回路研究」ブレインサイエンス・レビュー 2018　ブレインサイエンス振興財団・廣川信隆（編）（クバプロ）, pp.383-403

山下　貴之（2017）「触覚の腹側系と背側系」Clinical Neuroscience, 35, 166-168.

山下　貴之、山中章弘（2016）「オレキシン受容体の生理的および薬理的機能」Clinical Neuroscience, 34, 612-613.

高橋　智幸、堀　哲也、中村　行宏、山下　貴之（2011）「プレシナプス機構のスライスパッチクランプ研究法」最新パッチクランプ実験技術法　岡田泰伸（編）（吉岡書店）,　pp.96-102.

山下　貴之（2010）「Dynamin 依存性シナプス小胞エンドサイトーシス」 生体の科学 61, 548-549.

山下　貴之（2006）「直径 40 nm のリサイクル」 生物工学会誌 84, 502.

Patent in Japan

山下　貴之、松原　崇紀、柳田　健之、河口　範明 「オプシンの活性を調節する方法」 特願 2019-155659 特開 2021-031467 (2019 年 8 月 28 日出願)

Research grant

2025 – 2028　MEXT/JSPS: Grants-in-Aid for Scientific Research Grant-in-Aid for Scientific Research (B) (PI: 14,500,000 JPY)

2025 – 2027　MEXT/JSPS: Grant-in-Aid for Transformative Research Areas (A) (PI: 5,400,000 JPY)

2025 – 2029 Asahi Glass Foundation: Step-up Grant (PI: 14,000,000 JPY)

2024 – 2026 MEXT/JSPS: Grant-in-Aid for Challenging Research (Exploratory) (Member: 600,000 JPY)

2024 – 2026 Smitomo Pharma: PRISM (PI: 4,250,000 JPY)

2023 – 2028 Takeda Science Foundation: Visionary Research Grant (PI: 1,800,000 JPY)

2023 – 2025 MEXT/JSPS: Grant-in-Aid for Transformative Research Areas (A) (PI: 6,000,000 JPY)

2023 – 2025 MEXT/JSPS: Grant-in-Aid for Transformative Research Areas (A) (PI: 5,400,000 JPY)

2023 – 2025 Research Foundation for the Electrotechnology of Chubu: Research Grant (PI: 1,890,000 JPY)

2022 – 2025 MEXT/JSPS: Grants-in-Aid for Scientific Research Grant-in-Aid for Scientific Research (B) (PI: 13,400,000 JPY)

2021 – 2024 MEXT/JSPS: Grant-in-Aid for Challenging Research (Exploratory) (PI: 4,800,000 JPY)

2021 – 2028 JST: FOREST (PI: +27,200,000 JPY)

2021 – 2023 MEXT/JSPS: Grant-in-Aid for Scientific Research on Innovative Areas (Research in a proposed research area) (PI: 4,800,000 JPY)

2021 – 2022 The Japanese Association of Medical Sciences: Research Grant (PI: 1,000,000 JPY)

2021 – 2022 The Uehara Memorial Foundation: Special Research Grant (PI: 4,000,000 JPY)

2020 – 2023 Asahi Glass Foundation: Continuation Grants for Young Researchers (PI: 6,000,000 JPY)

2020 – 2022 The Naito Foundation: Research Grant (PI: 3,000,000 JPY)

2020 – 2021 The Ichiro Kanehara Foundation for the Promotion of Medical Sciences and Medical Care: Scholarship Grant for Research in Basic Medical Sciences and Medical Care (PI: 1,000,000 JPY)

2019 – 2022 MEXT/JSPS: Grants-in-Aid for Scientific Research (B) (PI: 13,600,000 JPY)

2018 – 2021 MEXT/JSPS: Grant-in-Aid for Challenging Research (Exploratory) (PI: 4,800,000 JPY)

2018 – 2020 Kato Memorial Bioscience Foundation: Research Grant (PI: 2,000,000 JPY)

2018 – 2019 The Hori Sciences and Arts Foundation: Research Grant (PI: 1,000,000 JPY)

2017 – 2019 MEXT/JSPS: Grant-in-Aid for Scientific Research on Innovative Areas (Research in a proposed research area) (PI: 8,500,000 JPY)

2016 – 2017 Sumitomo Foundation: Research Grant for Basic Science (PI: 1,900,000 JPY)

2016 – 2020 JST: PRESTO (PI: 43,000,000 JPY)

2016 – 2018 Takeda Science Foundation: Research Grant for Medical Science (PI: 2,000,000 JPY)

2016 – 2018 Narishige Neuroscience Research Foundation: Research Grant (PI: 400,000 JPY)

2016 – 2019	MEXT/JSPS: Grant-in-Aid for Young Scientists (A) (PI: 19,700,000 JPY)
2016 – 2018	The Asahi Glass Foundation: Promotion Research Grant (PI: 2,000,000 JPY)
2016 – 2017	Brain Science Foundation (PI: 1,000,000 JPY)
2015 – 2017	Japan Health Foundation (PI: 900,000 JPY)
2015 – 2017	MEXT/JSPS: Grant-in-Aid for Challenging Exploratory Research (PI: 3,000,000 JPY)
2008 – 2011	MEXT/JSPS: Grant-in-Aid for Young Scientists (B) (PI: 3,300,000 JPY)
2004 – 2006	JSPS: Grant-in-Aid for JSPS Fellows (PI: 2,800,000 JPY)

Editorial and Review Activities

Editorial Board Member:

- *Frontiers in Neuroscience* (2022 - present)

Peer Review Activities (ad hoc reviewer):

- *Nature Communications*
- *Science Advances*
- *Current Biology*
- *eLife*
- *Communications Biology*
- *iScience*
- *Communications Engineering*
- *Cerebral Cortex*
- *Frontiers in Neuroscience*
- *Journal of Neurophysiology*
- *European Journal of Neuroscience*
- *Neuroscience*
- *Neuroscience Research*