

Curriculum Vitae

Masanori Murayama, Ph.D.

Senior Team Leader

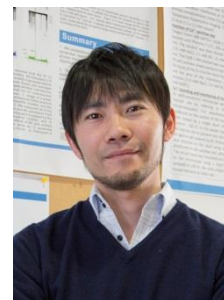
Date of birth: 26 October 1977

Work Address: Laboratory for Behavioral Neurophysiology,

Brain Science Institute (BSI), RIKEN,

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Research Interest

Neural mechanisms of sensory perception

Education

Ph.D. March 2006, Tokyo University of Pharmacy and Life Science
(2005-2006, Prof. Hiroyoshi Miyakawa; 2001-2005, Prof. Yoshihisa Kudo)

B.S. March 2001, Tokyo University of Pharmacy and Life Science
(1997-2001, Prof. Yoshihisa Kudo)

Scientific Employment

Feb. 2017 – present Senior Team leader at BSI.

Mar. 2010 – Jan. 2017 Team leader, Laboratory for Behavioral Neurophysiology, Brain Science Institute (BSI), Riken, Japan

Apr. 2016 – present Associate professor (concurrent post), Department of Electrical and Electronic Engineering, Tokyo University of Agriculture and Technology

Apr. 2012-Mar. 2016 Associate professor (concurrent post), School and Graduate school of Bioscience and Biotechnology, Tokyo Institute of Technology.

Apr. 2006 - Feb. 2010 Post-doctoral fellow, Department of Physiology, University of Bern, Switzerland

Scientific Training

Summer 2010 Transcranial flavoprotein fluorescence imaging, Department of Neurophysiology (Prof. Shibuki), Brain Research Institute, Niigata University, Japan.

Winter 2005 Two-photon microscope for in vivo experiments, immunofluorescent and immunochemistry staining techniques, Hirase Research Unit (Dr. Hirase), BSI RIKEN, Japan.

Winter 2003 In vivo whole-cell patch-clamp recording from anaesthetized rats, Center

- for Molecular and Behavioral Neuroscience, (Prof. Buzsáki), Rutgers University, USA
- Summer 2003 Unit recordings from monkey and rats. Department of System Neurophysiology (Prof. Nanbu), National Institute for Physiological Science (NIPS), Japan.
- Summer 2002 Two-photon Ca^{2+} imaging from spines of CA1 pyramidal cells using rat hippocampal slices. Department of Cell Physiology (Prof. Kasai), NIPS, Japan.
- Summer 2001 Making amplifiers for electrophysiology, Technical Division, NIPS, Japan.

Awards

- 2016 The Young Scientists' Prize, the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, Japan.
- 2016 Young Investigator Award, Physiological Society of Japan.
- 2015 Encouragement Award, the 8th Japanese Association for the Study of Musculoskeletal Pain.
- 2010 Young Investigator Award, Japan Neuroscience Society.
- 2010 Himura-Wagner Award, the 13th Conference of Peace through Mind/Brain Science.
- 2009 Travel Fellowship, Swiss Society for Neuroscience.
- 2007 Second prize for poster presentation, the 3rd annual meeting of Clinical Neuroscience in Bern.

Certification

- 2000 Advanced biotechnological engineer, Japan Association of Biotechnology Education.

Selected Publications (* corresponding author)

1. Dendritic spikes in sensory perception. Manita S, Miyakawa H, Kitamura K, Murayama M. **Frontiers in Cellular Neuroscience**. 11, 29. Feb 2017.
2. Top-down cortical input during NREM sleep consolidates perceptual memory. Miyamoto D, Hirai D, Fung CCA, Inutsuka A, Odagawa M, Suzuki T, Boehringer R, Adaikkan C, Matsubara C, Matsuki N, Fukai T, McHugh TJ, Yamanaka A, *Murayama M. **Science** 352(6291) 1315-1318 Jun 2016.
3. A Top-Down Cortical Circuit for Accurate Sensory Perception. Manita S, Suzuki T, Homma C, Matsumoto T, Odagawa M, Yamada K, Ota K, Matsubara C, Inutsuka A, Sato M, Ohkura M, Yamanaka A, Yanagawa Y, Nakai J, Hayashi Y, Larkum ME, *Murayama M. **Neuron** 86(5) 1304-1316 Jun 2015.
4. Enhanced dendritic activity in awake rats. Murayama M, *Larkum ME. **PNAS** 106(48) 20482-20486 Dec 2009.
5. Dendritic encoding of sensory stimuli controlled by deep cortical interneurons. Murayama M, Pérez-Garci E, Nevian T, Bock T, Senn W, *Larkum ME. **Nature** 457(7233) 1137-1141 Feb 2009.

Peer-Reviewed Publications (* corresponding author)

1. Dendritic spikes in sensory perception. Manita S, Miyakawa H, Kitamura K, Murayama M. **Frontiers in Cellular Neuroscience**. 11, 29. Feb 2017.
2. Top-down cortical input during NREM sleep consolidates perceptual memory. Miyamoto D, Hirai D, Fung CCA, Inutsuka A, Odagawa M, Suzuki T, Boehringer R, Adaikkan C, Matsubara C, Matsuki N, Fukai T, McHugh TJ, Yamanaka A, *Murayama M. **Science** 352(6291) 1315-1318 Jun 2016.
3. Brief hind paw stimulation is sufficient to induce delayed somatosensory discrimination learning in C57BL/6 mice. Hirasawa N, Yamada K, *Murayama M. **Behavioural Brain Research** 301 102-109 Mar 2016.
4. Craniotomy for cortical voltage-sensitive dye imaging in mice. Suzuki T, *Murayama M. **Bio-protocol**, 6, 3, Feb 2016.
5. The fiber-optic imaging and manipulation of neural activity during animal behavior. Miyamoto D, *Murayama M. **Neuroscience Research** 103 1-9 Feb 2016 (review article).
6. A Top-Down Cortical Circuit for Accurate Sensory Perception. Manita S, Suzuki T, Homma C, Matsumoto T, Odagawa M, Yamada K, Ota K, Matsubara C, Inutsuka A, Sato M, Ohkura M, Yamanaka A, Yanagawa Y, Nakai J, Hayashi Y, Larkum ME, *Murayama M. **Neuron** 86(5) 1304-1316 Jun 2015.
7. Spike detection from noisy neural data in linear-probe recordings. *Takekawa T, Ota K, Murayama M, *Fukai T. **Eur J Neuroscience** 39(11) 1943-1950 Jun 2014.
8. Fiber-optic calcium monitoring of dendritic activity in vivo. Murayama M, *Larkum ME. **Cold Spring Harbor Protocols** 2012 218-225 Feb 2012.
9. The cellular basis of GABA(B)-mediated interhemispheric inhibition. Palmer LM, Schulz JM, Murphy SC, Ledergerber D, Murayama M, *Larkum ME. **Science** 335 989-993 Feb 2012.
10. Inhibitory Regulation of Dendritic Activity in vivo. Palmer L, Murayama M, *Larkum ME. **Frontiers in Neural Circuits** 6, 26, 2012 (review article).
11. Optical recording of neuronal activity with a genetically-encoded calcium indicator in anesthetized and freely moving mice. Lütcke H[†], Murayama M[†], Hahn T, Margolis DJ, Astori S, Zum Alten Borgloh SM, Göbel W, Yang Y, Tang W, Kügler S, Sprengel R, Nagai T, Miyawaki A, Larkum ME, *Helmchen F, *Hasan MT. **Frontiers in Neural Circuits** 4, 9 Apr 2010. [†] co-first author.
12. Enhanced dendritic activity in awake rats. Murayama M, *Larkum ME. **PNAS** 106(48) 20482-20486 Dec 2009.
13. In vivo dendritic calcium imaging with a fiberoptic periscope system. Murayama M, *Larkum ME. **Nature Protocols** 4 1551-1559 2009.

14. Dendritic encoding of sensory stimuli controlled by deep cortical interneurons. Murayama M, Pérez-Garci E, Nevian T, Bock T, Senn W, *Larkum ME. **Nature** 457(7233) 1137-1141 Feb 2009.
15. Fiberoptic system for recording dendritic calcium signals in layer 5 neocortical pyramidal cells in freely moving rats. Murayama M, Pérez-Garci E, Lüscher HR, *Larkum ME. **Journal of Neurophysiology** 98 1791-1805 Sep 2007.
16. Optical monitoring of progressive synchronization in dentate granule cells during population burst activities. Murayama M, Miyazaki K, Kudo Y, Miyakawa H, *Inoue M. **Eur J Neuroscience** 21 3349-3360 Jun 2005.

Book Chapters

1. Chapter 13. Dendritic integration in vivo, Palmer L, Murayama M, Larkum ME. **Dendrites** (3rd edition), Oxford University Press, Edited by Greg Stuart, Nelson Spruston, and Michael Häusser (2016)
2. Chapter 82. Fiber-Optic Calcium Monitoring of Dendritic Activity. Murayama M, Larkum ME. **Imaging in Neuroscience: A Laboratory Manual**, Cold Spring Harbor Laboratory Press, Edited By Fritjof Helmchen & Arthur Konnerth (2011)

Invited Talks

1. Murayama M (2017). Top-down cortical circuit for perception and memory consolidation. **The Pharmaceutical Society of Japan-Tokaishibu**. Nagoya, Japan.
2. Murayama M (2016). Top-Down Cortical Input for Perception and Memory Consolidation. **The 17th Mechanism of Brain and Mind, the Winter Workshop 2017**. Hokkaido, Japan.
3. Murayama M (2016). Cortical top-down input for perceptual memory consolidation. **The 5th Annual IIS Symposium**. Tokyo, Japan.
4. Murayama M (2016). A top-down circuit for somatosensory perception in mice. **Animal consciousness meeting**. Seattle, USA.
5. Murayama M (2016). Cortical circuit for sensory perception and memory consolidation. **Multidisciplinary Brain Science 2016**, Mongolia.
6. Murayama M (2016), Perceptual memory consolidation during NREM sleep requires a cortical top-down circuit. **Frontier Brain Science Seminar**, University of Toyama, Toyama, Japan.
7. Murayama M (2016), A top-down cortical circuit for perception and memory consolidation. **Uppsala University**, Sweden.
8. Murayama M (2016), A top-down cortical circuit for perceptual memory consolidation during NREM sleep. **A meeting sponsored by The U.S.-Japan Brain Research Cooperative Program: Current Trends and Future Directions of Synaptic Plasticity Research**, USA.
9. Murayama M (2015). Top-down input during NREM sleep is required for perceptual memory consolidation. **The 7th International Symposium on Optogenetics: Neural Circuits and Neuromodulations**, Tokyo, Japan.
10. Murayama M (2015). Reverberating cortical circuit for accurate sensory perception.

- Brain Conference 2015**, Korea.
11. Murayama M (2015). Optogenetic control of cortical circuit and sensory perception. **Multidisciplinary Brain Science 2015**, Mongolia.
 12. Murayama M (2015). Top-down input is required for accurate sensory perception. **Gordon Research Conference: Dendrites 2015**, USA.
 13. Murayama M (2014). Cortical Architecture of a Sensory-Motor Circuit. **Systems Neurobiology Spring School**, Kyoto, Japan.
 14. Murayama M (2013). Cortical Architecture of a Sensory-Motor Circuit. **Chinese Neuroscience Meeting**, Chia.
 15. Murayama M (2013). Top-down control of sensory perception in behaving mice. **Optogenetics 2013**, Tokyo, Japan.
 16. Murayama M (2013). Sensory-motor circuit for sensory perception. **Annual Meeting of the Molecular Biology Society of Japan**, Hyogo, Japan.
 17. Murayama M (2013). Sensory-motor circuit for sensory perception. **ASahct 2013**. Miyagi, Japan.
 18. Murayama M (2011). Fiberoptic Ca²⁺ imaging of dendrites in freely moving rats. **The 8th International Congress of Comparative Physiology and Biochemistry**, Aichi, Japan.
 19. Murayama M (2011). Dendritic bi-cording of sensory and motor information in living animals. **2nd International Symposium on Photonic Bioimaging**, Hokkaido, Japan.
 20. Murayama M (2010), Large Dendritic Activity in Awake Animals. **Synapse Meeting 2010-Synaptic plasticity as a basis of learning and memory**, NIPS, Nagoya, Japan.
 21. Murayama M (2010), Dendritic activity in awake animals. **The 5th International Neural Microcircuitry Conference-Microcircuitry of Cortex**, Tokyo, Japan.
 22. Murayama M (2010), Optical imaging of dendrites in freely moving animals. **Fresh Perspectives of Computation in Neuronal Systems**, International Workshop in Okazaki, Japan.
 23. Murayama M (2010), Optical imaging in the cortex of freely moving animals. **The 13th Conference of Peace through Mind/Brain Science**, Shizuoka, Japan.