

Curriculum Vitae

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Position

Professor

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Education

2001 Ph.D. (Medicine), Graduate School of Medicine, The University of Tokyo, Japan

1996 M. Sci., Graduate School of Science, The University of Tokyo, Japan

1994 B. Sci., Department of Biophysics and Biochemistry, School of Science, The University of Tokyo, Japan

Academic Employment

2018- Team leader, RIKEN Center for Brain Science, Japan

2016- Professor, The University of Tokyo, Japan

2010-2016 Professor, National Institute for Basic Biology, Japan, SOKENDAI, Japan

2008-2010 Associate Professor, The University of Tokyo, Japan

2005-2007 Assistant Professor, The University of Tokyo, Japan

2002-2005 Assistant Professor, National Institute for Physiological Sciences, Japan

Awards

2017 JSPS (Japan Society for the Promotion of Science) Prize, Japan

2005 The Young Scientists' Prize, The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, Japan

2005 Young Investigator Award, Japan Neuroscience Society

Publications

1. Terada S., Kobayashi K., Ohkura M., Nakai J., and **Matsuzaki M.** Super-wide-field two-photon imaging with a micro-optical device moving in post-objective space. *Nature Communications* 9, 3550, 2018.

2. Tanaka Y.H., Tanaka Y.R., Kondo M., Terada S., Kawaguchi Y., and **Matsuzaki M.** Thalamocortical axonal activity in motor cortex exhibits layer-specific dynamics during motor learning. *Neuron* 100, AOP, 2018.
3. Yoshida E., Terada S., Tanaka Y.H., Kobayashi K., Ohkura M., Nakai J., and **Matsuzaki M.** Wide-field calcium imaging of mouse thalamocortical synapses with an 8 K ultra-high-definition camera. *Scientific Reports* 8, 8324, 2018.
4. Ebina, T., Masamizu Y., Tanaka Y.R., Watakabe A., Hirakawa R., Hirayama Y., Hira R., Terada S., Koketsu D., Hikosaka K., Mizukami H., Nambu A., Sasaki E., Yamamori T., and **Matsuzaki M.** Two-photon imaging of neuronal activity in motor cortex of marmosets during upper-limb movement tasks. *Nature Communications* 9, 1879, 2018.
5. Endo K., Ishigaki S., Masamizu Y., Fujioka Y., Watakabe A., Yamamori T., Hatanaka N., Nambu A., Okado H., Katsuno M., Watanabe H., **Matsuzaki M.**, and Sobue G. Silencing of FUS in the common marmoset (*Callithrix jacchus*) brain via stereotaxic injection of an adeno-associated virus encoding shRNA. *Neuroscience Research* 130, 56-64, 2018.
6. Kondo M., Kobayashi K., Ohkura M., Nakai J., and **Matsuzaki M.** Two-photon calcium imaging of the medial prefrontal cortex and hippocampus without cortical invasion. *eLife* 6, e26839, 2017.
7. Terada S., Matsubara D., Onodera K., **Matsuzaki M.**, Uemura T., and Usui T. Neuronal processing of noxious thermal stimuli mediated by dendritic Ca²⁺ influx in *Drosophila* sensory neurons. *eLife* 5, e12959, 2016.
8. Sadakane O., Masamizu Y., Watakabe A., Terada S., Ohtsuka M., Takaji M., Mizukami H., Ozawa K., Kawasaki H., **Matsuzaki M.**, and Yamamori T. Long-term two-photon calcium imaging of neuronal populations with subcellular resolution in adult non-human primates. *Cell Reports* 13, 1989-1999, 2015.
9. Hira R., Terada S., Kondo M., and **Matsuzaki M.** Distinct functional modules for discrete and rhythmic forelimb movements in the mouse motor cortex. *Journal of Neuroscience* 35, 13311-13322, 2015.
10. Hira R., Ohkubo F., Masamizu Y., Ohkura M., Nakai J., Okada T., and **Matsuzaki M.** Reward-timing-dependent bidirectional modulation of cortical microcircuits during optical single-neuron operant conditioning. *Nature Communications* 5, 5551, 2014.
11. Masamizu Y., Tanaka Y.R., Tanaka Y.H., Hira R., Ohkubo F., Kitamura K., Isomura Y., Okada T., and **Matsuzaki M.** Two distinct layer-specific dynamics of cortical ensembles during learning of a motor task. *Nature Neuroscience* 17, 987-994, 2014.
12. Asrican B., Augustine G.J., Berglund K., Chen S., Chow N., Deisseroth K., Feng G., Gloss B., Hira R., Hoffmann C., Kasai H., Katarya M., Kim J., Kudolo J., Lee L., Lo S., Mancuso J., **Matsuzaki M.**, Nakajima R., Qui L., Tan G., Tang Y., Ting J.T., Tsuda S., Wen L., Zhang X, and Zhao S. Next-generation transgenic mice for optogenetic analysis of neural circuits. *Frontiers in Neural Circuits* 7, 160, 2013.
13. Hayama T., Noguchi J., Watanabe S., Takahashi N., Hayashi-Takagi A., Ellis-Davies G.C.R., **Matsuzaki M.**, and Kasai H. GABA promotes the competitive selection of dendritic spines by controlling local Ca²⁺ signaling. *Nature Neuroscience* 16, 1409-1416, 2013.
14. Hira R., Ohkubo F., Tanaka Y.R., Masamizu Y., Augustine G.J., Kasai H., and **Matsuzaki M.** In vivo optogenetic tracing of functional corticocortical connections between motor forelimb areas. *Frontiers in Neural Circuits* 7, 55, 2013.

15. Hira R., Ohkubo F., Ozawa K., Isomura Y., Kitamura K., Kano M., Kasai H., and **Matsuzaki M.** Spatiotemporal dynamics of functional clusters of neurons in the mouse motor cortex during a voluntary movement. *Journal of Neuroscience* 33, 1377-1390, 2013.
16. Kimura R., Saiki A., Fujiwara-Tsukamoto Y., Ohkubo F., Kitamura K., **Matsuzaki M.**, Sakai Y., and Isomura Y. Reinforcing operandum: rapid and reliable learning of skilled forelimb movements by head-fixed rodents. *Journal of Neurophysiology* 108, 1781-1792, 2012.
17. Ako R., Wakimoto M., Ebisu H., Tanno K., Hira R., Kasai H., **Matsuzaki M.**, and Kawasaki H. Simultaneous visualization of multiple neuronal properties with single-cell resolution in the living rodent brain. *Molecular and Cellular Neuroscience* 48, 246-257, 2011.
18. Kanemoto Y., **Matsuzaki M.**, Morita S., Hayama T., Noguchi J., Senda N., Momotake A., Arai T., and Kasai H. Spatial distributions of GABA receptors and local inhibition of Ca^{2+} transients studied with GABA uncaging in the dendrites of CA1 pyramidal neurons. *PLoS One* 6, e22652, 2011.
19. Noguchi J., Nagaoka A., Watanabe S., Ellis-Davies G.C.R., Kitamura K., Kano M., **Matsuzaki M.**, and Kasai H. In vivo two-photon uncaging of glutamate revealing the structure-function relationships of dendritic spines in the neocortex of adult mice. *Journal of Physiology* 589, 2447-2457, 2011.
20. **Matsuzaki M.**, Ellis-Davies G.C.R., Kanemoto Y. and Kasai H. Simultaneous two-photon activation of presynaptic cells and calcium imaging in postsynaptic dendritic spines. *Neural Systems & Circuits* 1, 2, 2011.
21. **Matsuzaki M.**, Hayama T., Kasai H. and Ellis-Davies G.C.R. Two-photon uncaging of γ -aminobutyric acid in intact brain tissue. *Nature Chemical Biology* 6, 255-257, 2010.
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24. Hira R., Honkura N., Noguchi J., Maruyama Y., Augustine G.J., Kasai H. and **Matsuzaki M.** Transcranial optogenetic stimulation for functional mapping of the motor cortex. *Journal of Neuroscience Methods* 179, 258-263, 2009.
25. Yasumatsu N., **Matsuzaki M.**, Miyazaki T., Noguchi J. and Kasai H. Principles of long-term dynamics of dendritic spines. *Journal of Neuroscience* 28, 13592-13608, 2008.
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28. **Matsuzaki M.**, Ellis-Davies G.C.R. and Kasai H. High-resolution mapping of synaptic connections by two-photon macro photolysis of caged glutamate. *Journal of Neurophysiology* 99, 1535-1544, 2008.
29. Ellis-Davies G.C.R., **Matsuzaki M.**, Paukert M., Kasai H. and Bergles D.E. 4-carboxymethoxy-5,7-dinitroindolyl-glu: an improved caged glutamate for expeditious ultraviolet and 2-photon photolysis in brain slices. *Journal of Neuroscience* 27, 6601-6604, 2007.

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