CURRICULUM VITAE

Name: Goichi Miyoshi
Work Address: 507, 5th Floor, NYU Neuroscience Institute, Smilow Research Center,
New York University School of Medicine, 522 First Avenue, New York, NY, 10016
Phone: 212-263-7693 Fax: 212-263-9170 Cell: 646-420-3441
e-mail: Goichi.Miyoshi@gmail.com

Education / Research Experience

4/2004-present NYU Neuroscience Institute, Smilow Research Center / Skirball Institute
New York University School of Medicine, New York, NY
Postdoctoral fellow, laboratory of Dr. Gordon Fishell

4/1999-3/2004 Graduate School of Biostudies, Kyoto University
Graduate student, laboratory of Dr. Ryoichiro Kageyama
Ph.D., Biostudy May 2004

4/1995-3/1999 Department of Industrial Chemistry, Faculty of Engineering, Kyoto University
Bachelor of Science, Engineering, March 1999

Grants / Fellowships

4/2005-3/2007 Japan Society for the Promotion of Science, Postdoctoral Fellowships for Research Abroad

1/2009-12/2010 NARSAD Young Investigator Award
'Serotonergic Neuromodulation and Cortical Inter Neuron Function as a Model of Schizophrenia'

Research Background and Techniques

Fishell lab (Postdoc):

I carried out two complementary *in vivo* inducible genetic fate-mapping studies and determined a near complete picture of when and where mouse cortical interneurons subtypes are produced. I characterized mature morphologies, molecular expression profiles and electrophysiological properties of interneurons fate-mapped from the various time points of MGE and CGE (Miyoshi et al., 2007 and 2010, cited 187 and 184 times, respectively). I have further demonstrated that the coordination of tangential and radial migration phases of both GABAergic interneurons (Miyoshi and Fishell, 2011) and pyramidal cells (Miyoshi and Fishell, 2012) is critical for the proper assembly of neocortical networks. More recently, I identified *Prox1*, as the first known transcription factor that selectively regulates the cortical layering and circuit integration of CGE-derived interneurons.

Kageyama lab (graduate school):

I identified a transcriptional master regulator of GABAergic neurogenesis within the developing midbrain (Miyoshi et al., 2004).

Publications

Google Scholar Link
http://scholar.google.com/citations?hl=en&user=IWdDHMIAAAAJ&view_op=list_works&sortby=pubdate

Miyoshi, G., Young, A., Petros, T., Karayannis, T., Mckenzie Chang, M, Lavado, A., Iwano, T., Nakajima, M., Taniguchi, H., Huang, J., Heintz, N., Oliver, G., Matsuzaki, F., Machold, R.P., and Fishell, G. (Manuscript submitted). *Prox1* regulates the subtype-specific development of caudal ganglionic eminence-derived GABAergic cortical interneurons

Sakamoto, M., Ieki, N., **Miyoshi, G.**, Mochimaru, D., Miyachi, H., Imura, T., Yamaguchi, M., Fishell, G., Mori, K., Kageyama, R., and Imayoshi, I. (2014). Continuous postnatal neurogenesis contributes to formation of the olfactory bulb neural circuits and flexible olfactory associative learning. The Journal of Neuroscience *34*, 5788-5799.

Miyoshi, G., Machold, R.P., and Fishell, G. (2013). Specification of GABAergic Neocortical Interneurons. Cortical Development: Neural Diversity and Neocortical Organization, Chapter 5, R. Kageyama, ed. DOI 10.1007/978-4-431-54496-8_5, Springer Book Chapter.
http://link.springer.com/chapter/10.1007%2F978-4-431-54496-8_5 File link

Miyoshi, G., and Fishell, G. (2012). Dynamic FoxG1 Expression Coordinates the Integration of Multipolar Pyramidal Neuron Precursors into the Cortical Plate. Neuron *74*, 1045-1058.

Allene, C., Picardo, M.A., Becq, H., **Miyoshi, G.**, Fishell, G., and Cossart, R. (2012). Dynamic changes in interneuron morphophysiological properties mark the maturation of hippocampal network activity. The Journal of Neuroscience *32*, 6688-6698.

Imayoshi, I., Hirano, K., Sakamoto, M., **Miyoshi, G.**, Imura, T., Kitano, S., Miyachi, H., and Kageyama, R. (2012). A multifunctional teal-fluorescent Rosa26 reporter mouse line for Cre- and Flp-mediated recombination. Neuroscience research *73*, 85-91.

Taniguchi, H., He, M., Wu, P., Kim, S., Paik, R., Sugino, K., Kvitsiani, D., Fu, Y., Lu, J., Lin, Y., **Miyoshi, G.**, Shima, Y., Fishell, G., Nelson, S.B., and Huang, Z.J. (2011). A resource of Cre driver lines for genetic targeting of GABAergic neurons in cerebral cortex. Neuron *71*, 995-1013.

Miyoshi, G., and Fishell, G. (2011). GABAergic interneuron lineages selectively sort into specific cortical layers during early postnatal development. Cereb Cortex *21*, 845-852.

Jeanneteau, F., Deinhardt, K., **Miyoshi, G.**, Bennett, A.M., and Chao, M.V. (2010). The MAP kinase phosphatase MKP-1 regulates BDNF-induced axon branching. Nature Neuroscience *13*, 1373-1379.

Tricoire, L., Pelkey, K.A., Daw, M.I., Sousa, V.H., **Miyoshi, G.**, Jeffries, B., Cauli, B., Fishell, G., and McBain, C.J. (2010). Common origins of hippocampal Ivy and nitric oxide synthase expressing neurogliaform cells. The Journal of Neuroscience *30*, 2165-2176.

Miyoshi, G., Hjerling-Leffler, J., Karayannis, T., Sousa, V.H., Butt, S.J., Battiste, J., Johnson, J.E., Machold, R.P., and Fishell, G. (2010). Genetic fate mapping reveals that the caudal ganglionic eminence produces a large and diverse population of superficial cortical interneurons. The Journal of Neuroscience *30*, 1582-1594.

Sousa, V.H., **Miyoshi, G.**, Hjerling-Leffler, J., Karayannis, T., and Fishell, G. (2009). Characterization of Nkx6-2-derived neocortical interneuron lineages. Cereb Cortex *19 Suppl 1*, i1-10.

Cocas, L.A., **Miyoshi, G.**, Carney, R.S., Sousa, V.H., Hirata, T., Jones, K.R., Fishell, G., Huntsman, M.M., and Corbin, J.G. (2009). Emx1-lineage progenitors differentially contribute to neural diversity in the striatum and amygdala. The Journal of Neuroscience *29*, 15933-15946.

Butt, S.J., Sousa, V.H., Fuccillo, M.V., Hjerling-Leffler, J., **Miyoshi, G.**, Kimura, S., and Fishell, G. (2008). The requirement of Nkx2-1 in the temporal specification of cortical interneuron subtypes. Neuron *59*, 722-732.

Miyoshi, G., Butt, S.J., Takebayashi, H., and Fishell, G. (2007). Physiologically distinct temporal cohorts of cortical interneurons arise from telencephalic Olig2-expressing precursors. The Journal of Neuroscience *27*, 7786-7798.

Battiste, J., Helms, A.W., Kim, E.J., Savage, T.K., Lagace, D.C., Mandyam, C.D., Eisch, A.J., **Miyoshi, G.**, and Johnson, J.E. (2007). Ascl1 defines sequentially generated lineage-restricted neuronal and oligodendrocyte precursor cells in the spinal cord. Development *134*, 285-293.

Miyoshi, G., and Fishell, G. (2006). Directing neuron-specific transgene expression in the mouse CNS. Current Opinion in Neurobiology *16*, 577-584.

Akagi, T., Inoue, T., **Miyoshi, G.**, Bessho, Y., Takahashi, M., Lee, J.E., Guillemot, F., and Kageyama, R. (2004). Requirement of multiple basic helix-loop-helix genes for retinal neuronal subtype specification. The Journal of Biological Chemistry *279*, 28492-28498.

Miyoshi, G., Bessho, Y., Yamada, S., and Kageyama, R. (2004). Identification of a novel basic helix-loop-helix gene, Heslike, and its role in GABAergic neurogenesis. The Journal of Neuroscience *24*, 3672-3682.

Satow, T., Bae, S.K., Inoue, T., Inoue, C., **Miyoshi, G.**, Tomita, K., Bessho, Y., Hashimoto, N., and Kageyama, R. (2001). The basic helix-loop-helix gene hesr2 promotes gliogenesis in mouse retina. The Journal of Neuroscience *21*, 1265-1273.

Bessho, Y., **Miyoshi, G.**, Sakata, R., and Kageyama, R. (2001). Hes7: a bHLH-type repressor gene regulated by Notch and expressed in the presomitic mesoderm. Genes to Cells : devoted to molecular & cellular mechanisms *6*, 175-185.

Publications and Reviews in Japanese

Miyoshi, G. (2014). Development of GABAergic Neocortical Interneurons.
Igaku no Ayumi, Vol. *251*, No. *13*, 1129-1136**,** December 27
File link

Miyoshi, G. (2012). Dynamic FoxG1 Expression Coordinates the Integration of Multipolar Pyramidal Neuron Precursors into the Cortical Plate.
Life science review, July 11
http://first.lifesciencedb.jp/archives/5201

Invited talks and presentations

Neural Stem Cell Origins of Excitatory and Inhibitory Cortical Neuron Types
Miyoshi, G.
Job Seminar, Institute for Stem Cell and the Department of Neuroscience
Albert Einstein College of Medicine April 16th (2015)

Excitatory and Inhibitory Circuit Assembly within the Cerebral Cortex
Miyoshi, G.
Picower Special Job Seminar
Brain Cognitive Sciences, The Picower Institute, MIT January 20th (2015)

Assembly of GABAergic inhibitory circuitry within the cerebral cortex
Miyoshi, G.
National Institute of Genetics Symposium "Circuit construction in the mammalian brain"
National Institute of Genetics, Shizuoka, Japan December 2nd (2014)

Prox1 regulates the migration and maturation of caudal ganglionic eminence-derived cortical interneurons
Miyoshi, G.
Gordon Research Conference Neural Development
Salve Regina University, Newport, RI, USA August 14th (2012)
https://www.grc.org/programs.aspx?year=2012&program=neurdev

Prox1 regulates the migration and maturation of caudal ganglionic eminence-derived cortical interneurons
Miyoshi, G.
The 35th Annual Meeting of the Molecular Biology Society of Japan
Regulation of Neural Stem Cell Differentiation in Mammalian Neural Development
Organizers: Imayoshi, Itaru (Kyoto Univ.) | Miyoshi, Goichi (Neuroscience Inst., NYU)
Fukuoka International Congress Center, Fukuoka, Japan December 12th (2012)

GABAergic interneuron lineages selectively sort into specific cortical layers during early postnatal development
Miyoshi, G.
Annual Research Symposia 2010 *Wiring the Nervous System from Brain to Spinal Cord*
Speakers: Pasko Rakic (Yale), **Goichi Miyoshi** (NYU), Raj Awatramani (Northwestern), Gary Gaufo (UTSA), Jeremy Dasen (NYU HHMI)
University of Texas San Antonio, TX, USA April 9th (2010)
http://neuroscience.utsa.edu/Symposium2010.html

Specification of GABAergic neocortical interneuron subtypes

Miyoshi, G.

Multiple facets of GABA in brain development

INMED Satellite Conference of SFN 2009

Chair Scientific Program Committee: Yehezkel Ben-Ari, INMED France

Prentice Women's hospital, Chicago, USA October 16th (2009)

http://www.frontiersin.org/Community/AbstractDetails.aspx?ABS_DOI=10.3389/conf.neuro.03.2009.13.004&eid=432&sname=INMED_Satellite_Conference_of_SFN_-_Neuroscience_2009_Multiple_Facets_of_GABA_in_Brain_Development

Talks and Seminars

Assembly of GABAergic inhibitory circuitry within the cerebral cortex
Miyoshi, G.
Graduate School of Frontier Biosciences, Osaka University, Osaka, Japan
November 25, 2014

Prox1 regulates the subtype-specific development of CGE-derived GABAergic cortical interneurons
Miyoshi, G.,
Institute for Virus Research, Kyoto University, Kyoto, Japan
November 26, 2012

Genetic regulation of the development of cortical interneurons and principal cells
Miyoshi, G.,
Global COE seminar, Keio University, Tokyo, Japan
December 6, 2010

Genetic regulation of the development of cortical interneurons and principal cells
Miyoshi, G.,
Director-General Invited Seminar, National Institute for Physiological Sciences, Okazaki, Aichi, Japan
November 29, 2010

Caudal ganglionic eminence produces a large and diverse population of superficial cortical interneurons
Miyoshi, G.
Gordon Research Conference Inhibition in the CNS, Colby College, Waterville, ME, USA
July 28, 2009

Defining the spatiotemporal origins of GABAergic cortical interneuron subtypes
Miyoshi, G.,
RIKEN Brain Science Institute, Wako, Saitama, Japan
December 5, 2008

Defining the spatiotemporal origins of GABAergic cortical interneuron subtypes
Miyoshi, G.,
Nagoya University, Nagoya, Japan
December 4, 2008

Defining the spatiotemporal origins of GABAergic cortical interneuron subtypes
Miyoshi, G.,
Institute for Virus Research, Kyoto University, Kyoto, Japan
December 3, 2008

Defining the spatiotemporal origins of GABAergic cortical interneuron subtypes
Miyoshi, G.,
RIKEN Center for Developmental Biology, Kobe, Hyogo, Japan
December 2, 2008

Defining the spatiotemporal origins of GABAergic cortical interneuron subtypes

Miyoshi, G.,

COE seminars, Nara Institute of Science and Technology, Nara, Japan

November 28, 2008

Defining the spatiotemporal origins of GABAergic cortical interneuron subtypes

Miyoshi, G.,

Global COE Seminar, Osaka University, Osaka, Japan

November 26, 2008

Genetic Origins of Cortical Interneuron Subtypes

Miyoshi, G.,

RIKEN Center for Developmental Biology, Kobe, Hyogo, Japan

March 7, 2007

Roles of a Novel bHLH Gene, *Heslike*, in Generation of Mesencephalic GABAergic Neurons

Miyoshi, G.

76th Annual Meeting of the Japanese Biochemical Society, Yokohama, Japan

October 16, 2003

Poster presentations

Prox1 regulates the migration and maturation of caudal ganglionic eminence-derived cortical interneurons

Miyoshi, G., Young, A., Petros, T., Karayannis, T., Chang, M., Van Versendaal, D., Lavado, A., Iwano, T., Taniguchi, H., Nakajima, M., Huang, J. Z., Heintz, N., Oliver, G., Matsuzaki, F., Machold, R., Fishell, G.

44th Annual Meeting of the Society-for-Neuroscience, Washington DC, USA

November 15 -19, 2014

Prox1 regulates the subtype-specific development of CGE-derived GABAergic cortical interneurons

Miyoshi, G., Young, A., Petros, T., Karayannis, T., Chang, M., Lavado, A., Iwano, T., Nakajima, M., Taniguchi, H., Huang, J. Z., Heintz, N., Oliver, G., Matsuzaki, F., Machold, R., Fishell, G.

Gordon Research Conference Neural Development, Salve Regina University, Newport, RI, USA

August 10- 15 2014

Prox1 regulates the migration and maturation of caudal ganglionic eminence-derived cortical interneurons

Miyoshi, G., Young, A., Karayannis, T., Chang, M., Petros, T., Lavado, A., Iwano, T., Taniguchi, H., Nakajima, M., Huang, J. Z., Heintz, N., Oliver, G., Matsuzaki, F., Machold, R., Fishell, G.

43rd Annual Meeting of the Society-for-Neuroscience, San Diego, CA, USA

November 09 -13, 2013

Prox1 regulates both the migration and maturation of caudal ganglionic eminence-derived cortical interneurons

Miyoshi, G., Karayannis, T., Roberta, A., McKenzie, M., Lavado, A., Iwano, T., Taniguchi, H., Nakajima, M., Matsuzaki, F., Huang, J. Z., Heintz, N., Oliver, G., Fishell, G.

42nd Annual Meeting of the Society-for-Neuroscience, New Orleans, LA, USA

October 13 -17, 2012

Prox1 regulates the migration and maturation of caudal ganglionic eminence-derived cortical interneuron subtypes

Miyoshi, G., Young, A., Karayannis, T., Petros, T., Chang, M., Lavado, A., Iwano, T., Taniguchi, H., Nakajima, M., Machold, R., Heintz, N., Huang, J. Z., Matsuzaki, F., Oliver, G., Fishell, G.

Gordon Research Conference Neural Development, Salve Regina University, Newport, RI, USA
August 12- 17 2012

Dynamic FoxG1 Expression Coordinates the Integration of Multipolar Pyramidal Neuron Precursors into the Cortical Plate

Miyoshi, G., Fishell, G.

Genomics and Systems Biology, NYU Abu Dhabi, UAE
February 14-16, 2012

Dynamic regulation of FoxG1 is required for the specification and integration of pyramidal neurons into the cortical plate

Miyoshi, G., Fishell, G.

41st Annual Meeting of the Society-for-Neuroscience, Washington, DC, USA
November 12 -16, 2011

Dynamic FoxG1 Expression Coordinates the Integration of Multipolar Pyramidal Neuron Precursors into the Cortical Plate

Miyoshi, G., Fishell, G.

Janelia conferences, Control of Neuronal Identity, Ashbum, VA, USA
October 9 -12, 2011

Dynamic regulation of FoxG1 is required for the specification and integration of pyramidal neurons into the cortical plate

Miyoshi, G., Fishell, G.

Cortical Development, Chania, Crete, Greece
May 19 -22, 2011

FoxG1 coordinates the postmitotic integration of pyramidal neurons into the cortical layers

Miyoshi, G., Fishell, G.

40th Annual Meeting of the Society-for-Neuroscience, San Diego, CA, USA
November 13 -17, 2010

FoxG1 coordinates the postmitotic integration of pyramidal neurons into the cortical layers

Miyoshi, G., Fishell, G.

Gordon Research Conference Neural Development, Salve Regina University, Newport, RI, USA
August 15- 20, 2010

Caudal ganglionic eminence uses a novel integration strategy for acquiring their laminar fate in the cortex

Miyoshi, G., Hjerling-Leffler, J., Karayannis, T., McKenzie, M., Sousa, V., Battiste, J., Johnson, J., Fishell, G.

39th Annual Meeting of the Society-for-Neuroscience, Chicago, IL, USA
October 17 -21, 2009

GABAergic interneuron lineages selectively sort into specific cortical layers during early postnatal development

Miyoshi, G., Hjerling-Leffler, J., Karayannis, T., Sousa, V., Butt, S.J.B., Battiste, J., Johnson, J., Machold, R., Fishell, G.

Gordon Research Conference Inhibition in the CNS, Colby College, Waterville, ME, USA
July 26- 31, 2009

FoxG1 regulates neuronal migration in the cerebral cortex

Miyoshi, G., Sousa, V., Hanashima, C., Fishell, G.

38th Annual Meeting of the Society-for-Neuroscience, Washington, DC, USA
November 15 -19, 2008

Spatiotemporal integration of cortical interneuron subtypes from the CGE is distinct from the MGE

Miyoshi, G., Hjerling-Leffler, J., Sousa, V., Karayannis, T., Butt, S.J.B., Yanagawa, Y., Battiste, J., Johnson, J., Fishell, G.

Gordon Research Conference Neural Development, Salve Regina University, Newport, RI, USA
August 17- 22, 2008

FoxG1 regulates neuronal migration in the cerebral cortex

Miyoshi, G., Sousa, V., Hanashima, C., Fishell, G.

Cortical Development, Chania, Crete, Greece
May 22 -25, 2008

FoxG1 specifies the ventral telencephalic cell types

Miyoshi, G., Sousa, V., Hanashima, C., Fishell, G.

37th Annual Meeting of the Society-for-Neuroscience, San Diego, CA, USA
November 3 -7, 2007

The CGE produces temporal cohorts of interneurons that migrate to distinct forebrain regions

Miyoshi, G., Hjerling-Leffler, J., Butt, S.J.B., Sousa, V., Battiste, J., Johnson, J., Fishell, G.

Gordon Research Conference Inhibition in the CNS, Colby College, Waterville, ME, USA
July 22- 27, 2007

Olig2 positive progenitors give rise to specific populations of cortical interneuron subtypes in a temporally regulated manner

Miyoshi, G., Butt, S.J.B., Takebayashi, H., Fishell, G.

36th Annual Meeting of the Society-for-Neuroscience, Atlanta, GA, USA
October 14 -18, 2006

Physiologically distinct temporal cohorts of cortical interneurons arise from *Olig2* Expressing Progenitors

Miyoshi, G., Butt, S.J.B., Takebayashi, H., Fishell, G.

Gordon Research Conference Neural Development, Salve Regina University, Newport, RI, USA
August 20- 25, 2006

$Olig2^{+}$ progenitors give rise to specific populations of cortical interneurons and oligodendrocytes in a temporally regulated Manner

Miyoshi, G., Butt, S.J.B., Takebayashi, H., Fishell, G.

35th Annual Meeting of the Society-for-Neuroscience, Washington, DC, USA
November 11 -16, 2005

$Olig2^{+}$ progenitors give rise to specific populations of cortical interneurons and oligodendrocytes in a temporally regulated Manner

Miyoshi, G., Butt, S.J.B., Takebayashi, H., Fishell, G.

Cortical Development, Santorini, Greece

May 12 -15, 2005

Specification of GABAergic Neuronal Subtype Identity by bHLH Gene *Heslike* in Mouse Mesencephalon

Miyoshi, G., Bessho, Y., Yamada, S., Kageyama, R.

Keystone Symposia Meeting, Signaling in Vertebrate Organogenesis, Santa Fe, NM, USA

February 26 - March 2, 2004

Roles of a novel bHLH gene, heslike, in generation of mesencephalic GABAergic neurons

Miyoshi, G., Bessho, Y., Yamada, S., Kageyama, R.

26th Annual Meeting of the Molecular Biology Society of Japan, Kobe, Hyogo, Japan

December 10 -13, 2003

Roles of a novel bHLH gene, heslike, in generation of mesencephalic GABAergic neurons

Miyoshi, G., Bessho, Y., Yamada, S., Kageyama, R.

33rd Annual Meeting of the Society of Neuroscience, New Orleans, LA, USA

November 08 -12, 2003

Roles of a Novel bHLH Gene, *Heslike*, in Generation of Mesencephalic GABAergic Neurons

Miyoshi, G., Bessho, Y., Yamada, S., Kageyama, R.

76th Annual Meeting of the Japanese Biochemical Society, Yokohama, Japan

October 15 -18, 2003

Roles of a novel bHLH gene, heslike, in generation of mesencephalic GABAergic neurons

Miyoshi, G., Bessho, Y., Yamada, S., Kageyama, R.

36th Annual Meeting of the Japanese Society of Developmental Biologists, Sapporo, Hokkaido, Japan

June 11 -13, 2003

References

Gordon Fishell
Professor and Director of Smilow Neuroscience Program
Associate Director of the NYU Neuroscience Institute
5th flr. Smilow Research Building
NYU Langone School of Medicine
522 1st Ave, New York, NY, 10016
Phone: 212-263-7691
Fax: 212-263-2248
email: fisheg01@nyumc.org
http://med.nyu.edu/fishelllab/

Alexandra L. Joyner
Courtney Steel Chair in Pediatric Cancer Research
Memorial Sloan-Kettering Cancer Center
Developmental Biology Program, Sloan-Kettering Institute
Rockefeller Research Labs, rm 701
430 E. 67th St., New York, NY 10065
Office: 212-639-3962;
Fax: 212-717-3738; Lab: 212-639-3980
email: joynera@mskcc.org
http://www.ski.edu/joyner

Assistant: Cara Monaco e-mail: monacoc@mskcc.org; phone: 212-639-3929

Ryoichiro Kageyama
Laboratory of Growth Regulation
Institute for Virus Research, Kyoto University
53 Shogoin-Kawaharacho, Sakyo-ku, Kyoto 606-8507, Japan
Phone: +81-75-751-4011
Fax: +81-75-751-4807
email: rkageyam@virus.kyoto-u.ac.jp
http://www.virus.kyoto-u.ac.jp/Lab/Kageyama/index_English.html