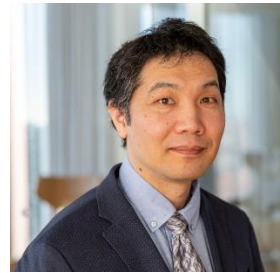


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Current position:

Main appointment: Professor, Center for Translational Neuromedicine, University of Copenhagen
Other appointment(s): Adjunct Professor of Neurology, Center for Translational Neuromedicine, School of Medicine and Dentistry, University of Rochester Medical Center

Education:

1993-1996: Ph.D., Neuroscience, Department of Anatomy and Developmental Biology, University College London, (University of London, UK) (Ph.D. awarded in April 1997)
1990-1993: B.Sc. (1st Class Honours), Computer Science, University College London (University of London, UK)

Work experience:

2019-present Professor, Center for Translational Neuromedicine, University of Copenhagen.
2022-present Adjunct Professor of Neurology, School of Medicine and Dentistry, University of Rochester Medical Center, Rochester, NY
2009-2019 Affiliated Associate Professor, Brain and Body System Science Institute, Saitama University
2004-2020 Principal Investigator, RIKEN (2004-2011 Unit Leader, 2011-2020 Team Leader; 2004-2018 Brain Science Institute, 2018-2020 Center for Brain Science)
2003-2004 Research Assistant Professor, Center for Molecular and Behavioral Neuroscience, Rutgers University, Newark, NJ
2000-2001 Postdoctoral Fellow, Department of Biological Sciences, Columbia University, New York, NY (Mentor: Rafael Yuste)
1996-2002 Postdoctoral Fellow, Center of Molecular and Behavioral Neuroscience, Rutgers University, Newark, NJ (Mentor: György Buzsáki)

Editorial positions:

Editorial board (current): General Psychiatry (2017-present), Neuroscience Next (2019-2020), GLIA (2019-present), International Journal of Molecular Sciences (2021-present)
Editorial board(past): Progress in Brain Research (2014-2020), Opera Medica et Physiologica (2014-2020), Neuroglia (2018-2019), OA Neurosciences, (2013-2015)
Review editor (current): Frontiers in Neural Circuits (2012-present), Frontiers in Cellular Neuroscience (2014-present), Frontiers in Integrative Neuroscience (2018-present)
Permanent Advisory Board: International Astrocyte School, 2011-present

Awards and fellowships received:

UCL Japan Scholarship (1993)
 Overseas Research Students Awards (1994-1996)
 Human Frontier Long-Term Fellowship (1998-2000)
 Uehara Memorial Foundation Fellowship (2000-2001)
 Epilepsy Foundation Research Training Fellowship (2003-2004)
 Lundbeck Foundation visiting professorship (2016, to University of Copenhagen, with Prof. Maiken Nedergaard)

Grants received:

Grant-in-Aid for Scientific Research on Priority Areas from the Ministry of Education, Culture, Sports, Science and Technology (Grant #17022048) ¥2,700,000 Year 2005

Grant-in-Aid for Scientific Research on Priority Areas from the Ministry of Education, Culture, Sports, Science and Technology (Grant #18053026) ¥6,100,000 Year 2006-2007

Human Frontier Research Grant (Grant #RGY0073/2006-C, Principal Investigator: Attila Sik), \$337,500, Year 2006-2008

Grant-in-Aid for Challenging Exploratory Research from the Ministry of Education, Culture, Sports, Science and Technology (Grant #21650081) ¥3,100,000 Year 2009-2010

Saitama Regional Innovation Cluster Program (Principal Investigator: Junichi Nakai), ¥4,630,000, Year 2010-2012

Grant-in-Aid for Innovative Research from the Ministry of Education, Culture, Sports, Science and Technology (Grant #23115522) ¥5,400,000 Year 2011-2012

Grant-in-Aid for Innovative Research from the Japan Society for the Promotion of Science (Grant #26117520) ¥6,700,000 Year 2014-2015

Human Frontier Research Grant (Grant #RGP0036/2014, Principal Investigator: Giovanni Marsicano), appx. \$300,000 Year 2014-2016

Grant-in-Aid for Challenging Exploratory Research from the Japan Society for the Promotion of Science (Grant #16K13116) ¥2,700,000 Year 2016-2017

Grant-in-Aid for Scientific Research (A) the Japan Society for the Promotion of Science (Grant #16H01888) ¥33,500,000 Year 2016-2019

Grant-in-Aid for Innovative Research from the Japan Society for the Promotion of Science (Grant #18H05150) ¥4,400,000 Year 2018-2019

The Novo Nordisk Foundation Project Grant in Bioscience and Basic Biomedicine (0058058) DKK 2,500,000 Year 2020-2022.

The Lundbeck Foundation grant for international meetings. "Brain States: transformation of neural circuit dynamics and functions" DKK 300,000 (Meeting held on October 13-14, 2021).

DFE Independent Research Fund Denmark (0134-00107B), DKK 6,191,507 Year 2020-2024

Danish Agency for Higher Education and Science: International Network Programme (with NIPER, India and University of Miami, USA), DKK 258,198 Year 2021-2022.

Lundbeck Foundation NIH Brain Initiative (R360-2021-613), DKK 3,000,000 Year 2022-2024.

Ono Pharmaceutical collaboration grant, Eur 974,000 (~DKK 7,200,000) Year 2022-2024.

NIH/NINDS U19 Brain Initiative Team-Research BRAIN Circuit Programs (U19NS128613) \$691,000 (~DKK 5,100,000) Year 2022-2027

Lundbeck Foundation Experiment (R436-2023-1219), DKK 1,999,998 Year 2024-2025

Ph.D. thesis:

Hirase H., "Performance analysis of a partially connected recurrent associative net", Ph.D. thesis, University College London – University of London, UK, 1997

Research articles:

Hirase H., Recce M, (1996) A search for the optimal thresholding sequence in an associative memory. *Network: Computation in Neural Systems* 7: 741-758

Csicsvari J, Hirase H., Czurko A, Buzsaki G (1998) Reliability and state dependence of pyramidal cell-interneuron synapses in the hippocampus: an ensemble approach in the behaving rat. *Neuron* 21:179-189.

Czurko A, Hirase H., Csicsvari J, Buzsaki G (1999) Sustained activation of hippocampal pyramidal cells by 'space clamping' in a running wheel. *Eur J Neurosci* 11:344-352.

Csicsvari J, Hirase H., Czurko A, Mamiya A, Buzsaki G (1999) Fast network oscillations in the hippocampal CA1 region of the behaving rat. *J Neurosci* 19:RC20.

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Nadasdy Z, Hirase H., Czurko A, Csicsvari J, Buzsaki G (1999) Replay and time compression of recurring spike sequences in the hippocampus. *J Neurosci* 19:9497-9507.

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Reviews/comments:

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- Hirase H (2002) Local field potential and neuronal firing in rat hippocampus. *Saibo Kogaku (Cell Engineering)*, 21: 999-1003 (Japanese).
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- Hirase H, Takata N (2007) In vivo measurements of astrocyte dynamics. *Brain Nerve* 59:773-781 (Japanese).
- Shinohara Y, Hirase H (2009) Size and receptor density of glutamatergic synapses: a viewpoint from left-right asymmetry of CA3-CA1 connections. *Frontiers in Neuroanatomy* 3:10.
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- Hirase H, Iwai Y, Takata N, Shinohara Y, Mishima T (2014) Volume transmission signalling via astrocytes. *Philos Trans R Soc Lond B Biol Sci* 369:20130604.
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- Monai H, [Hirase H](#) (2016) Astrocytic calcium activation in a mouse model of tDCS – extended discussion. *Neurogenesis* 3, DOI: 10.1080/23262133.2016.1240055
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- Hirase H, Nedergaard M. (2023) Locomotion induces fundamentally different patterns of Ca²⁺ signaling in astrocytes and neurons. *Function* DOI: 10.1093/function/zqad028

Invited lectures/symposia:

Third International Congress of the World Federation of Sleep Research Societies, October 2001, Punta del Este, Uruguay, "Memory formation during sleep"

International Symposium: Glial Activities in Neural Plasticity and Information Processing, January 2005, Tokyo, Japan, "Calcium dynamics of cortical astrocytes in vivo"

7th European Meeting on Glial Cell Function in Health and Disease (EUROGLIA), May 2005, Amsterdam, Netherlands. "Calcium dynamics of cortical astrocytes in vivo"

6th FENS Forum of European Neuroscience Satellite Symposium on Synaptic and Extrasynaptic Signaling Versus Glia, July, 2008, Geneva, Switzerland, "Neuroglia communication through S100B"

11th Annual Japanese-American Kavli Frontiers of Science Symposium, December 2008, Irvine, USA, "Optical measurement and control of neural activity"

29th Naito Conference on GLIA WORLD, October 2010, Kanagawa, Japan, "Astrocytic modulation of local field potential and synaptic plasticity"

1st Japanese-French Frontiers of Engineering Symposium, October 2008, Grenoble, France, "In vivo investigation of astrocytic dynamics"

Gordon Research Conference: Glial Biology, March 2011, Ventura, USA, "Astrocytic modulation of sensory-evoked LFP response"

14th Annual Meeting of the Korean Society for Brain and Neural Science, September 2011, Seoul, Korea "Astrocytic modulation of local field potential in vivo"

International Astrocyte School, March 2011, 2012, 2014. Bertinoro, Italy, "Modulation of sensory induced cortical plasticity by astrocytic calcium elevation" (permanent advisory board)

First International Symposium on In Vivo Microscopy, May 2012, Helsinki, Finland, "Cholinergic modulation of in vivo barrel cortical plasticity via astrocytes"

SFB 894 Calcium Signaling: Molecular Mechanisms and Integrative Functions, September 2012, Saarland University, Homburg, Germany, "Astrocyte calcium signaling transforms cholinergic modulation to cortical plasticity in vivo"

Cajal Institute seminar, September 2012, Madrid, Spain, "Astrocyte Ca²⁺ surges, gamma oscillations, and synaptic plasticity"

UAB Mini Symposium: Physiology and Pathophysiology of Astroglia, October 2012, Birmingham, AL, "Astrocyte calcium signaling in plasticity of local cortical circuits in vivo"

11th European Meeting on Glial Cells in Health and Disease (Euroglia), July 2013, Berlin, Germany, "Astrocytic Ca²⁺ surges, gamma oscillations, and synaptic plasticity" Invited seminar at Scuola Normale Superiore, April 2014, Pisa, Italy, "Experience enhances gamma oscillations and interhemispheric asymmetry in the hippocampus"

Special Neuroscience Seminar, October 2014, Paris Descartes University, Paris, France. "Ca²⁺ signaling of astrocytes in cortical plasticity and blood flow"

Kick-off meeting of Human Frontiers Research Program, October 2014, Bordeaux, France. "Astrocytic Ca²⁺ surges, gamma oscillations, and synaptic plasticity"

Glial heterogeneity SPP 1757 Symposium, October 2014, Dusseldorf, Germany. "Ca²⁺ signaling of astrocytes in cortical plasticity and blood flow"

The 3rd "International Institute for Advanced Studies" Conference of Novel Developments on the Study of Life and Biological Systems Based on Genome Engineering

and Imaging Science", October 2014, Kyoto, Japan, "Ca²⁺ signaling of astrocytes in cortical plasticity"

Special Seminar, November, 2014, University of Minnesota, Minneapolis, "An attempt to monitor and manipulate astrocytic Ca²⁺ signaling in the cerebral cortex"

International Symposium 2014 (Current trends on neurobiology), Ulsan National Institute of Science and Technology, Ulsan, Korea, November 2014, "Experience-dependent development of gamma oscillations and interhemispheric asymmetry in the hippocampus"

27th International Symposium on Cerebral Blood Flow, Metabolism and Function & 12th International Conference on Quantification of Brain Function with PET (BRAIN 2015), June, 2015, Vancouver, Canada. "Cerebral blood flow modulation can occur independently of large cytosolic Ca²⁺ signaling in astrocytes"

6th FAONS Congress and Chinese Neuroscience Society Conference, September, 2015, Wuzhen, China, "Cortical plasticity induced via volume transmitter-activated glia"

1st IBRO/APRC Chandigarh Neuroscience Symposium, February, 2016, Chandigarh, India, "Cortical plasticity induced via volume transmitter-activated glia"

Invited seminar at National Institute of Neuroscience (NCNP), May 2016, Tokyo, Japan. "Activation of astrocytes by transcranial direct current stimulation" (in Japanese)

Special Seminars, May 2016, Korean Institute of Science and Technology (KIST) and Yonsei University, "Astrocyte-mediated synaptic plasticity promoted by volume-transmitted neuromodulators"

DNP/CBTN Seminar, August 2016, University of Copenhagen, "Transcranial direct current stimulation, astrocytes, and glycogen in the mouse brain"

NYC Neuromodulation 2017, January 2017, New York, NY "IDCS metaplasticity and astrocytic calcium in mice"

International Astrocyte School, March 2017, Bertinoro, Italy, "Role of astrocytic calcium elevation in transcranial direct current stimulation in mice" (permanent advisory board)

Two-photon Imaging Course, October 2017, Chongqing China, "Imaging of neural activity during transcranial DC stimulation"

20th International Symposium on Calcium Binding Proteins and Calcium Function in Health and Disease (CaBP20), October 2017, Awajishima, Japan, "Transcranial direct current stimulation triggers cortical metaplasticity via glial calcium elevation"

Saitama University Brain Center International Symposium, November 2017, Saitama, Japan. "Imaging of brain cell activity during transcranial DC stimulation"

Yanbian University Cellular Function Research Center special seminar, January 2018, Yanji, China. "Imaging of neural activity during transcranial DC stimulation"

13th International Conference on Brain Energy Metabolism, March 2018, Valdivia, Chile. "Brain glycogen distribution by glycogen immunohistochemistry in the mouse"

Brain Glycogen Symposium, June 2018, King Abdullah University of Science and Technology (KAUST), Saudi Arabia. "Brain glycogen distribution by glycogen immunohistochemistry in the mouse"

DFG priority programme Glial Heterogeneity meeting, October 2018, Speyer, Germany. "Imaging of neural activity during transcranial direct current stimulation"

The Brain Conferences: The necessity of cell types for brain function, October 2018, Copenhagen, Denmark. "Astrocyte heterogeneity: Adrenergic receptor antagonism provides neuroprotection and facilitates recovery from cortical spreading depression/depolarization" (selected for a short talk)

23rd Annual Meeting of the Japan Glia, December 2018, Nagoya, Japan. "Adrenergic receptor antagonism provides neuroprotection and facilitates recovery from cortical spreading depression/depolarization"

DFG-Forschergruppe 2795 mini-symposium: Synapses under stress, December 2018, Dusseldorf, Germany. "Macroscopic imaging of cortical spreading depression and recovery"

Gordon Research Conference: Glial Biology, March 2019, Ventura, USA, "Astrocytic GPCR activation in behaving and stroke mice"

Developing a theory on how brains work, May 2019, Copenhagen, Denmark. "Developing a theory on how brains work: a neuron-glia perspective"

CLS Lecture, June 2019, Tokyo Institute of Technology, Yokohama, Japan, "In vivo Ca²⁺ imaging of stroke in mice"

Neuro2019: the 42nd annual meeting of the Japan Neuroscience Society, July 2019, Niigata, Japan, "Heterogeneity of astrocytes as observed in glycogen distribution"

International Conference on Neurological Disorders & Therapeutics (ICNDT-2019), October 2019, NIPER, Ahmedabad, (Gandhinagar), India, "Macroscopic imaging of cortical spreading depression and recovery"

NYC Neuromodulation 2020 Online Conference, April 2020, "Microglial activation by tDCS in awake mice"

ASSM 2021 3rd congress of Asian Society of Sleep Medicine, May 2021, Beijing, China (virtual presentation), "Adrenergic Blockers Induce Neuroprotection and Facilitate Recovery from K⁺-induced Cortical Spreading Depression and Acute Ischemic Stroke"

39th Annual meeting of Indian Academy of Neurosciences, December 2021, Kolkata, India (virtual presentation), "Enhancement of remote memory by optogenetic activation of astrocytic Gq signaling"

Synaptic Microenvironment 2nd International Seminar and mini-Workshop, March 2022, Sölden, Austria, "Activity and activation of astrocytic metabotropic signaling"

8th Mediterranean Neuroscience Society Conference, June 2022, "Second messenger signaling expressed in cortical astrocytes during fear conditioning learning"

University of Miami Miller School of Medicine, Special seminar, November 2022, Miami, FL, USA, "Refined tools to investigate thrombosis by optical imaging"

15th Göttingen Meeting of the German Neuroscience Society, March 2023, Göttingen, Germany, "Astrocyte control of neural circuit function and animal behaviour"

Institute of Translational Research in Biomedicine, Kaohsiung Chang Gung Memorial Hospital special seminar, April 2023, Kaohsiung, Taiwan. "Optogenetic activation of transient astrocytic Gq signaling in frontal cortex"

NPAS Academia Sinica special seminar, April 2023, Taipei, Taiwan. "Optogenetic activation of transient astrocytic Gq signaling in frontal cortex"

BRIC neuroscience seminar, University of Copenhagen, seminar, August 2023. Copenhagen, Denmark. "Optogenetic induction of Gq-induced Ca^{2+} signaling in cortical astrocytes in vivo"

Inmed (Institute de neurobiologie de la méditerranée), invited seminar, September 2023. Marseilles, France.

"The effect of optogenetic Gq-induced astrocytic Ca^{2+} signaling on memory and blood flow"

50th Naito Conference on Glia World – Glial Cells Governing Brain Functions –, October 2023, Sapporo, Japan. "Optogenetic tools for chronic assessment of astrocyte-vascular functional relationship"

7th Glia Decode meeting (organized by young committee), October, 2023. Hokkaido University, Sapporo, Japan. "Laboratories, Life, and science"

Jiaxing University Symposium: The brain active milieu in norm and pathology. April 2024. Jiaxing, China. "A genetic toolset for investigating gliovascular interactions"

Dept Anatomy Special Seminar, National University of Taiwan, May 2024. Taipei, Taiwan. "Molecular genetics tools for visualization of microcirculation"