

“Neuro2007 Satellite Symposium”
“The 2nd MCCA-Asia Symposium”
“Unraveling Higher Brain functions: Recent Progress with Animal Models II”

Supported by RIKEN BSI Advanced Technology Development Group (ATDG)
and Molecular and Cellular Cognition Society (MCCA)-Asia

Place: Pacifico Yokohama (Room 301/302)

1-1-1 Minato Mirai, Nishi-ku, Yokohama, Japan

1-1-2 General Information TEL +81-45-221-2155

Date: September 8, 2007, 17:00-20:00 Poster Session

September 9, 2007, 9:00-18:00 Oral Session

September 8, 17:00-20:00

Poster Session

September 9, 9:00-18:00

Oral Session

9:00-9:10 Opening and welcome address

Paul CHAPMAN (President, MCCA-Asia)

Session 1 (Chair: Keiji Wada, National Institute of Neuroscience, NCNP)

9:10-9:35 **Thomas J. McHUGH** (Picower Institute for Learning and Memory, MIT, USA)

[The role of dentate gyrus NMDA receptors in optimizing spatial and contextual memory]

9:35-10:00 **Noboru KOMIYAMA** (Wellcome Trust Sanger Institute, UK)

[Genetic dissection approach to study NMDA receptor signaling]

10:00-10:25 **Masayuki SEKIGUCHI** (National Institute of Neuroscience, NCNP, Kodaira)

[Facilitation of extinction learning for fear memory by a potentiator of AMPA receptors]

10:25-10:40 Coffee break

Session 2 (Chair: Masayoshi Mishina, University of Tokyo)

10:40-11:05 **Alcino J. SILVA** (UCLA, USA)

[Molecular rules of memory allocation in neuronetworks]

11:05-11:30 **Tomoo HIRANO** (Kyoto University, Kyoto)

[Motor control and learning mechanism revealed using mutant mice]

11:30-11:55 **Guosong LIU** (Tsinghua University, China)

[Synaptic organization and its implication for learning and memory]

11:55-12:20 **Yuichi IINO** (University of Tokyo, Tokyo)

[Search for molecules essential for learning and memory by use of *C. elegans*]

12:20-14:20 Lunch and Poster

Session 3 (Chair: Satoshi Kida, Tokyo University of Agriculture)

14:20-14:45 **Ying-Shing CHAN** (University of Hong Kong, Hong Kong)

[Developmental refinement of spatial representation and sensory-motor integration]

14:45-15:10 **Takuji IWASATO** (RIKEN BSI, Wako)

[α -Chimerin-dependent Rac inactivation is critical for ephrinB3/EphA4 signaling in motor-circuit formation]

15:10-15:35 **Joe Z TSIEN** (Medical College of Georgia, USA; Shanghai Institute of Brain Functional Genomics, China)

[The organizing principles of real-time memory encoding]

15:35-15:50 Coffee break

Session 4 (Chair: Shigeyoshi Itohara, RIKEN Brain Science Institute)

16:00-16:25 **Sumantra CHATTARJI** (National Centre for Biological Sciences, TIFR, India)

[Modulation of fear and anxiety: "good plasticity" in a "bad neighborhood"]

16:25-16:50 **Teiichi FURUICHI** (RIKEN BSI, Wako, Japan)

[CAPS2, a regulator for BDNF release, is associated with susceptibility to autism]

16:50-17:15 **Tsuyoshi MIYAKAWA** (Fujita Health University, Toyoake, Japan)

[Investigating gene-to-behavior pathways in psychiatric disorders: the use of a

comprehensive behavioral test battery on genetically engineered mice]

17:15-17:40 **Paul CHAPMAN** (Glaxo Smith Kline, Singapore)

[From target to clinical trial: challenges and opportunities in cognition drug discovery]

17:40-17:55 Concluding remarks: **Alcino J. SILVA** (UCLA, USA)

Organizers:

Paul Chapman (Glaxo Smith Kline)

Sumantra Chattarji (National Centre for Biological Sciences, TIFR)

Shigeyoshi Itohara (RIKEN BSI)

Satoshi Kida (Tokyo University of Agriculture)

Masayoshi Mishina (University of Tokyo)

Atsushi Miyawaki (RIKEN BSI)

Keiji Wada (National Institute of Neuroscience, NCNP)

Poster Session

1) AMPA receptor dynamics in behaviorally activated neurons

Naoki Matsuo, and Mark Mayford

Department of Cell Biology, The Scripps Research Institute, 10550 North Torrey Pines Road,
La Jolla, CA 92037, USA

2) Study of D-serine function in vivo by establishing and analysis of serine racemase knockout mouse

Ying-Luan Zhao, and Hisashi Mori

Department of Molecular Neuroscience, Graduate School of Medicine and Pharmaceutical Sciences, University of Toyama, 2630 Sugitani, Toyama 930-0194, Japan.

3) Essential role of the striatonigral neural pathway in motor behavior revealed by conditional ablation of dopamine D1 receptor-containing neurons in the dorsal striatum

Ryoji Fukabori, Nobuyuki Kai, Yasunobu Yasoshima, and Kazuto Kobayashi

Department of Molecular Genetics, Institute of Biomedical Sciences, Fukushima Medical University School of Medicine, Fukushima 960-1295, Japan

4) Genetic deletion of NMDA receptor $\epsilon 4$ subunit affects phencyclidine-induced gene expressions in the striatum.

*H. YAMAMOTO¹, E. KAMEGAYA¹, Y. HAGINO¹, K. TATSUMI¹, S. YASUMOTO¹, T. YAMAMOTO², M. MISHINA³, H. KOGA⁴, K. IKEDA¹;

¹Division of Psychobiology, Tokyo Institute of Psychiatry, Kamikitazawa, Setagaya, Tokyo 156-8585, Japan; ²Mol. Recognition Grad. Sch. of Arts and Sci., Yokohama City Univ., Yokohama, Japan; ³Grad. Sch. of Medicine, Univ. of Tokyo, Tokyo, Japan; ⁴Dept. of Human Genome, Kazusa DNA Res. Inst., Chiba, Japan

5) Implication of matrix metalloprotease-9 in cognitive impairment induced by i.c.v. injection of A β in mice

Mizoguchi H^{1,2)}, Takuma K¹⁾, Fukuzaki S¹⁾, Ibi D¹⁾, Akita F¹⁾, Someya E¹⁾, Alkam T³⁾, Tsunekawa H³⁾, Mouri A³⁾, Noda Y⁴⁾, Nabeshima T^{3,5)} and Yamada K^{1,3)}

¹Laboratory of Neuropsychopharmacology, Division of Life Sciences, Graduate School of

Natural Science & Technology, Kanazawa University, Kanazawa, Japan ²Futuristic Environmental Simulation Center Research Institute of Environmental Medicine, Nagoya University, Nagoya, Japan ³Department of Neuropsychopharmacology and Hospital Pharmacy, Nagoya University Graduate School of Medicine, Nagoya, Japan ⁴Division of Clinical Science in Clinical Pharmacy Practice, Management and Research, Faculty of Pharmacy, Meijo University, Nagoya, Japan ⁵Department of Chemical Pharmacology, Graduate School of Pharmaceutical Sciences, Meijo University, Nagoya, Japan

6) Analysis of the molecular mechanism of neurite elimination using *C. elegans* as a model

Yu Hayashi¹, Takaaki Hirotsu², Eriko Kage-Nakada³, Hideaki Takeuchi¹, Hirofumi Kunitomo⁴, Yuichi Iino⁴, Takeo Kubo¹

¹Department of Biological Sciences, Graduate School of Science, The University of Tokyo, Tokyo 113-0033, Japan; ²Dept. of Biol., Fac. of Sci., Kyushu Univ. Grad. Sch; ³Dept. of Physiol., Tokyo Women's Med. Univ; ⁴Mol. Genet. Res. Lab., Univ. of Tokyo

7) The Roles of X11 and X11L in APP metabolism

Yuhki Saito¹, Yoshitake Sano², Tadashi Nakaya¹, Shigeyoshi Itoharu² and Toshiharu Suzuki¹

¹Laboratory of Neuroscience, Graduate School of Pharmaceutical Sciences, Hokkaido University, Sapporo 060-0812, Japan; ²Laboratory for Behavioral Genetics, RIKEN Brain Science Institute

8) A possible role for an adaptor protein, X11L/mint2, in risk assessment

Yoshitake Sano¹, Chad Boulay², Toshiharu Suzuki³, Niall Murphy², and Shigeyoshi Itoharu¹

¹Lab. Behavioral Genetics and ²Murphy Unit RIKEN BSI; ³Lab. Neuroscience, Hokkaido University

9) Axonal netrin-Gs transneuronally determine lamina-specific subdendritic segments

Sachiko Nishimura-Akiyoshi, Kimie Niimi, Toshiaki Nakashiba, and Shigeyoshi Itoharu
Behavioral Genetics, RRC, BSI, RIKEN

10) Genetic Dissection of Postnatal Development of the Mouse Barrel Cortex

T. Iwasato¹, L.J. Lee², R. Ando¹, Y.M. Saito¹, H. Kanki¹, L.J. Muglia³, R.S. Erzurumlu², S. Itoharu¹

¹Lab. Behavioral Genetics, RIKEN Brain Science Institute; ²Louisiana State University;
³Washington University

11) GABAB1a isoform, but not GABAB1b, assembles heteroreceptors at CA3-CA1 synapses. Its absence impairs synaptic plasticity and hippocampus-dependent memory.

Vigot R.^{1,2}, Barbieri S.^{1,3}, Brauner-Osborne H.^{1,4}, Turecek R.^{1,5}, Shigemoto R.⁶, Zhang Y-P.⁷, Jacobson L.³, Cryan J.³, Kaupmann K.³, Oertner T.⁷, Bettler B.¹

¹Department of Clinical-Biological Sciences, Institute of Physiology, Pharmazentrum, University of Basel, CH-4056 Basel, Switzerland; ²Unit for Molecular Neurobiology of Learning & Memory, Okinawa Institute of Science and Technology, Uruma, Okinawa 904-2234, Japan; ³Novartis Institute for Biomedical Research, Novartis Pharma AG, Basel, Switzerland; ⁴Department of Medicinal Chemistry, Danish University of Pharmaceutical Sciences, Copenhagen, Denmark; ⁵Institute of Experimental Medicine, Academy of Sciences, Prague, Czech Republic; ⁶Division of Cerebral Structure, National Institute for Physiological Sciences, Okazaki, Japan; ⁷Friedrich Miescher Institute, Basel, Switzerland

12) GABA receptors play roles in acquisition and retention of mouse eyeblink conditioning in the cerebellar nuclei.

Sakamoto T., Arasaki T., and Endo S.

Unit for Molecular Neurobiology of Learning & Memory, Okinawa Institute of Science and Technology, Uruma, Okinawa 904-2234, Japan

13) Comprehensive behavioral characterization of mice lacking ICER, an endogenous antagonist of CREB.

Borlikova G.¹, Arai M.¹, Kojima N.², Endo S.¹

¹Unit for Molecular Neurobiology of Learning & Memory, Okinawa Institute of Science and Technology, Uruma, Okinawa 904-2234, Japan; ²Department of Neurobiology and Behavior, Gunma University Graduate School of Medicine, Maebashi, Japan

14) Overexpression of ICER, an endogenous antagonist of CREB, impairs fear memory.

Arai M.¹, Borlikova G.¹, Kojima N.², Endo S.¹

¹Unit for Molecular Neurobiology of Learning & Memory, Okinawa Institute of Science and Technology, Uruma, Okinawa 904-2234, Japan; ²Department of Neurobiology and Behavior,

Gunma University Graduate School of Medicine, Maebashi, Japan

15) GluRd2 regulates long-term depression through its carboxyl terminal domain in cerebellar Purkinje cells

Takeshi Uemura¹, Sho Kakizawa², Miwako Yamasaki³, Kenji Sakimura,⁴ Masahiko Watanabe,³ Masamitsu Iino², and Masayoshi Mishina¹

¹ Department of Molecular Neurobiology & Pharmacology, Graduate School of Medicine, University of Tokyo, Tokyo 113-0033, Japan; ² Dept. Pharmacol., Grad. Sch. Med., Univ. of Tokyo, Tokyo, Japan; ³ Dept. Anat., Hokkaido Univ. Sch. Med., Sapporo, Japan; ⁴ Dept. Cell Neurobiol., Brain Res. Inst., Niigata Univ., Niigata, Japan

16) Enhancement of Memory Formation and LTP by up-regulation of CREB activity

Akinobu SUZUKI¹, Hotaka FUKUSHIMA¹, Min ZHUO², Satoshi KIDA¹

¹ Department of Bioscience, Tokyo University of Agriculture, Setagaya-ku, Tokyo 156-8502, Japan; ² Toronto University

17) Mechanisms of reconsolidation and extinction of contextual fear memory

Nori MAMIYA, Akinobu SUZUKI, Satoshi KIDA

Department of Bioscience, Tokyo University of Agriculture, Setagaya-ku, Tokyo 156-8502, Japan.

18) Transcription factor BMAL1 plays critical roles in memory formation

Shunsuke HASEGAWA, Hiroshi HOSODA, Satoshi KIDA

Department of Bioscience, Tokyo University of Agriculture, Setagaya-ku, Tokyo 156-8502, Japan.

19) Up-regulation of CaMKIV enhances the formation of long-term memory and improves age-related memory deficits

Hotaka FUKUSHIMA, Akinobu SUZUKI, Satoshi KIDA

Department of Bioscience, Tokyo University of Agriculture, Setagaya-ku, Tokyo 156-8502, Japan.

20) Analyses of anxiety-related behavior in transgenic mice overexpressing CaMKII in forebrain

Takahiro FURUICHI¹, Kengo ENDO¹, Taro YOSHIDA¹, Megumi SADO¹, Yasushi KAJII², Satoshi KIDA¹

¹ Department of Bioscience, Tokyo University of Agriculture, Setagaya-ku, Tokyo 156-8502, Japan. Department of Bioscience, Tokyo University of Agriculture, Setagaya-ku, Tokyo 156-8502, Japan; ² Research Laboratory I, Mitsubishi Pharma Corporation

21) Roles of gene expression regulation in consolidation and reconsolidation of object recognition memory

Emiko OKANO, Akinobu SUZUKI, Kengo ENDOH, Satoshi KIDA

Department of Bioscience, Tokyo University of Agriculture, Setagaya-ku, Tokyo 156-8502, Japan.

22) Mechanisms of reconsolidation and extinction of spatial memory

Kim RYANG, Yurisa YOSHIDA, Akinobu SUZUKI, Satoshi KIDA

Department of Bioscience, Tokyo University of Agriculture, Setagaya-ku, Tokyo 156-8502, Japan.

23) Roles of retinoic acid receptors in learning and memory

Hatsune ENOMOTO, Tesu CHOI, Shusaku UCHIDA, Takahisa MIYAO, Satoshi KIDA

Department of Bioscience, Tokyo University of Agriculture, Setagaya-ku, Tokyo 156-8502, Japan.

24) Activation of LVGCCs and CB1 receptors required for destabilization of reactivated contextual fear memories

Satoshi Kida, Akinobu Suzuki, Takuya Mukawa, Akinori Tsukagoshi

Department of Bioscience, Tokyo University of Agriculture, Setagaya-ku, Tokyo 156-8502, Japan.

25) A role of transcription factor SRF in learning and memory

Masanori NOMOTO, Hisahiro UMEEDA, Megumi SADO, Yurisa YOSHIDA, Satoshi KIDA

Department of Bioscience, Tokyo University of Agriculture, Setagaya-ku, Tokyo 156-8502, Japan.

26) 5-HT6 antagonist in cognition drug discovery: Development of the rat forced swimming test as a pharmacodynamic assay

Kazufumi Hirano, Richard A Rutter, Mahmood Ahmed, Neil D Miller, Darrel J Pemberton, Paul F Chapman

GlaxoSmithKline, N&GI CEDD, Biopolis at One-North, 11 Biopolis Way
The Helios Building, #03-01/02, Singapore 138667

27) Generation and analysis of transgenic rodents expressing fluorescent proteins in inhibitory neurons

Wang, Y.¹, Kakizaki, T.¹, Saito, K.^{1,2}, Hirai, K.^{2,3}, Kawaguchi, Y.^{2,3}, Ebihara, S.⁴, Sakagami, H.⁵, Kato, M.⁶, Hirabayashi, M.^{2,6}, and Yanagawa, Y.¹

¹ Department of Genetic and Behavioral Neuroscience, Gunma University Graduate School of Medicine, Maebashi 371-8511, Japan; ²The Graduate University for Advanced Studies; ³Division of Cerebral Circuitry, ⁶Center for Genetic analysis of Behavior, National Institute for Physiological Sciences; ⁴Advanced Industrial Science and Technology; ⁵Tohoku University Graduate School of Medicine

28) Deletion of the core-*H* region in mice abolishes the expression of three proximal odorant receptor genes in *cis*.

Hirofumi Nishizumi and Hitoshi Sakano

Department of Biophysics and Biochemistry, Graduate School of Science, The University of Tokyo, Tokyo 113-0032, Japan.

29) Glomerular map formation and odor perception in the dorsal zone- and class II-depleted mutant mice.

Reiko Kobayakawa, Ko Kobayakawa, and Hitoshi Sakano

Department of Biophysics and Biochemistry, Graduate School of Science, The University of Tokyo, Tokyo 113-0032, Japan.

30) Decoding an innate aversive quality from an odor map in the mouse olfactory bulb.

Ko Kobayakawa, Reiko Kobayakawa, and Hitoshi Sakano

Department of Biophysics and Biochemistry, Graduate School of Science, The University of Tokyo, Tokyo 113-0032, Japan.

31) Odorant receptor-dependent transcriptional regulation for the olfactory glomerular mapping.

Takeshi Imai, Takahiro Yamazaki and Hitoshi Sakano

Department of Biophysics and Biochemistry, Graduate School of Science, The University of Tokyo, Tokyo 113-0032, Japan.

32) A new model to evaluate affective states associated with reward-predicting cues in mice.

Barbara Cagniard, Niall P. Murphy

Neuronal Circuit Mechanisms Research Group, RIKEN Brain Science Institute, Wakoshi, Saitama 351-0198, Japan.

33) Medial prefrontal cortex is involved in extinction learning for recent but not remote contextual fear

K. Zushida, K. Wada, M. Sekiguchi.

Department of Degenerative Neurological Diseases, National Institute of Neuroscience, National Center of Neurology and Psychiatry, Kodaira, Tokyo 187-8502, Japan.

34) Estrogen prevents cerebrovascular deficits caused by the lack of M5 muscarinic acetylcholine receptor through MAPK activation

Runa Araya and Masahisa Yamada

Yamada Research Unit, RIKEN Brain Science Institute, Saitama 351-0198, Japan.

35) Which causes left-right difference in the zebrafish habenula: proliferation, timing of neurogenesis or cell death?

Hidenori Aizawa, Midori Goto, Tomomi Sato and Hitoshi Okamoto

Lab. For Developmental Gene Regulation, RIKEN Brain Science Institute, JAPAN

36) Tool use induces adult neurogenesis in the rodent (*Degu*; *Octodon degu*) hippocampus.

Noriko Kumazawa, Hiroshi Hama, Naoko Tokimoto, Eriko Kariya, Kazuo Okanoya, Atsushi Miyawaki, and Atsushi Iriki

Laboratory for Symbolic Cognitive Development, Laboratory for Cell Function Dynamics,
RIKEN Brain Science Institute, Wako 351-0198, Japan

37) Specific involvement of α -subtype of cytosolic phospholipase A2-Arachidonic acid-Cox cascade in the induction of cerebellar long-term depression.

Le T.¹, Shirai Y.¹, Shimizu T.² and Ito M.¹

¹Laboratory for Memory and Learning, RIKEN Brain Science Institute, Wako, Saitama 351-0198; ²Department of Biochemistry, Faculty of Medicine, University of Tokyo, Hongo, Bunkyo-ku 113, Tokyo, Japan.

38) Alpha-CaMKII deficiency causes dysregulated behaviours and immature dentate gyrus

Nobuyuki Yamasaki and Tsuyoshi Miyakawa

Division of Systems Medical Science, Institute for Comprehensive Medical Science, Fujita Health University. Toyoake, Aichi 470-1192, Japan

39) Deletion of Schnurri-2 causes multiple behavioral abnormalities related to psychiatric disorders in mice.

Keizo Takao and Tsuyoshi Miyakawa

Division of Systems Medical Science, Institute for Comprehensive Medical Science, Fujita Health University. Toyoake, Aichi 470-1192, Japan

40) Temporal window for consolidation of memory trace of motor learning revealed by adaptation of mouse optokinetic response eye movement

Takehito Okamoto¹, and Soichi Nagao^{1,2}

¹Lab for Motor Learning Control, RIKEN BSI, Saitama, Japan; ²SORST, JST, Saitama, Japan

41) Hexanoyl-Lysine- and 4-hydroxy-2-nonenal- modified proteins are increased in the brain of mouse models for Down's syndrome.

Keiichi ISHIHARA and Kazuhiro YAMAKAWA

Laboratory for Neurogenetics, RIKEN Brain Science Institute, 2-1 Hirosawa, Wako-shi, Saitama, 351-0198, Japan

42) Behavioral Phenotyping of the Ts1Cje Mouse, a Model for Down Syndrome.

Atsushi SHIMOHATA and Kazuhiro YAMAKAWA

Laboratory for Neurogenetics, RIKEN Brain Science Institute, 2-1 Hirosawa, Wako-shi, Saitama, 351-0198, Japan

43) Dscam deficiency causes congenital central hypoventilation.

Kenji AMANO and Kazuhiro YAMAKAWA

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44) EFHC1 deficiency increases seizure susceptibility in mice.

Toshimitsu SUZUKI and Kazuhiro YAMAKAWA

Laboratory for Neurogenetics, RIKEN Brain Science Institute, 2-1 Hirosawa, Wako-shi, Saitama, 351-0198, Japan

45) Epileptic seizures in mice carrying a premature stop codon in the voltage-gated sodium channel $\alpha 1$ gene: a model for human severe myoclonic epilepsy in infancy.

Ikuo OGIWARA and Kazuhiro YAMAKAWA

Laboratory for Neurogenetics, RIKEN Brain Science Institute, 2-1 Hirosawa, Wako-shi, Saitama, 351-0198, Japan

46) Dendritic Floppodia Formation is Mediated by the Interaction between Telencephalin and ERM Family Proteins.

Y. Furutani, H. Matsuno, M. Kawasaki, T. Sasaki, K. Mori, and Y. Yoshihara

Laboratory for Neurobiology of Synapse, RIKEN Brain Science Institute, 2-1 Hirosawa, Wako-shi, Saitama 351-0198, Japan.

47) Extracellular S100B increases the amplitude of kainate-induced gamma oscillation in vivo.

Seiichi Sakatani, Akiko Seto-Ohshima, Shigeyoshi Itoharu, Hajime Hirase

Hirase Research Unit, and Lab. for Behav. Genetics, RIKEN BSI, Wako, Japan

48) Collection, preservation, distribution of mouse models for higher brain functions created in Japan.

Atsushi Yoshiki¹, Fumio Ike¹, Noriko Hiraiwa¹, Hatsumi Nakata¹, Kazuyuki Mekada¹, Yasuyuki Kitaura¹, Keiji Mochida¹, Kuniya Abe¹, Atsuo Ogura¹, Tetsuo Noda², Yoichi Gondo², Shigeharu Wakana², Toshihiko Shiroishi², Kazuo Moriwaki¹, Yuichi Obata¹

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