

第 38 回生理学研究所コンファレンス・総研大 国際シンポジウム

「シナプスにおける機能分子のフローとストック」

第 38 回生理研コンファレンス・総研大国際シンポジウム「シナプスにおける機能分子のストックとフロー」は、2008 年 3 月 17 日-19 日の 3 日間に、自然科学研究機構・岡崎コンファレンスセンターにおいて開催された。シナプス機能分子の動態は現在、最先端の光学顕微鏡的方法でリアルタイムに一分子が観察できるようになっている一方、電子顕微鏡レベルでは分子数のカウントが可能になってきている。これにより今まで未知であった機能分子のダイナミックな調節について、多くの新しい事実が次々と報告されている。その中でも、パイオニア的存在の研究者達 (Antoine Triller 博士 (Ecole Normale Supérieure), Daniel Choquet 博士 (Bordeaux Univ., France), 柳田敏雄博士 (大阪大学), 楠見明弘博士 (京都大学), Stephan Sigrist 博士 (Universität Würzburg Germany), 河西春郎博士 (東京大学)) や電気生理学的、形態学的方法でシナプスの実体に向ける研究をされている一線の研究者達にご参加頂き、最新の成果を発表していただいた。日本の若き神経科学研究者や院生達も加わり、活発な質疑応答が交わされた。総数百名ほどの参加があり、非常に有意義なシンポジウムであった。



17th March 2008

Yasunobu Okada (NIPS) Greeting from Director General of NIPS

Chairman: Ryuichi Shigemoto

1. Toshio Yanagida (Osaka University)
Single Molecule Nano-Imaging: Fluctuation and Function of Life
2. Stephan Sigrist (Universität Würzburg)
Shedding light on the assembly of active zone structure and function

Chairman: Peter Somogyi

3. Yoshiyuki Kubota (NIPS)

Dendritic dimensions and synapse distribution of cortical nonpyramidal cells

4. Michael Häusser (University College London)

Traveling waves in cerebellar cortex mediated by asymmetric synaptic connections between Purkinje cells

Chairman: Yoshiyuki Kubota

5. Akihiro Kusumi (Kyoto University)

Single-molecule imaging of raft-based signal transduction in living cells: a system of digital signal transduction?

6. Gina Sosinsky (University of California, San Diego)

What multiscale imaging of connexins and pannexins tells us about the structure and dynamics of gap junctions.

18th March 2008

Chairman: Daniel Choquet

7. Toshiya Manabe (University of Tokyo)

The role of tyrosine phosphorylation of the NMDA receptor in synaptic plasticity and higher brain functions

8. Yoko Yamagata (NIPS)

Ca²⁺/calmodulin-dependent protein kinase II in structural remodeling of dendritic spines

9. Antoine Triller (Ecole Normale Supérieure)

Receptor diffusion and homeostatic regulation at inhibitory synapses

Chairman: Haruo Kasai

10. Daniel Choquet (Université Bordeaux)

New functions for AMPAR mobility in fast synaptic transmission

11. Masaki Fukata (NIPS)

Novel regulators of AMPA receptor function

Chairman: Antoine Triller

12. Ryuichi Shigemoto (NIPS)

AMPA receptors in synaptic and extrasynaptic membrane after LTP and LTD

13. Yasunori Hayashi (RIKEN-MIT)

Transport of postsynaptic proteins after LTP induction

14. Haruo Kasai (University of Tokyo)

Stock and flow of actin fibers in the dendrites

19th March 2008

Chairman: Michael Häusser

15. Mitsutoshi Setou (Hamamatsu University School of Medicine)

Mass Microscopic Analysis of Scrapper Mutant Mice

16. Nigel Emptage (University of Oxford)

Back-propagating action potentials modulate late-endosome to lysosome fusion via direct coupling between CaV1.2 and

syntaxin 1A

Chairman: Yasunori Hayashi

17. Y Masahiko Watanabe (Hokkaido University)

Glutamate transporters provide a 'winner-takes-more' strategy to activity-dependent synapse refinement

18. Peter Somogyi (University of Oxford)

Timing and spacing GABA action in the hippocampal neuronal network

Ryuichi Shigemoto (NIPS) Concluding Remark

Poster session 18th March 2008

P-1. Developmental shrinkage of Ca^{2+} domain size at the calyx of Held presynaptic terminal

Yukihiro Nakamura¹, David DiGregorio², Tomoyuki Takahashi^{1,3}

1:Doshisha University, 2:Universite Paris 5, 3:Okinawa Institute of Science and Technology

P-2. Mechanism of synaptic modulation induced by presynaptic membrane potential

Tetsuya Hori and Tomoyuki Takahashi

Doshisha University

P-3. Physiological role of GABA_B receptor at inhibitory synapses in developing LSO neurons

Takuya Nishimaki,^{1,2} Il-Sung Jang,^{1,2,3} Koji Ohno,⁴ and Junichi Nabekura^{1,2,5}

1:National Institute for Physiological Sciences, 2: Sokendai, 3:Kyungpook National University, 4:Hamamatsu University School of Medicine, 5: CREST

P-4. The structural interplay between the plasma membrane and cytoskeletons in neural systems: a deep-etch EM research

Nobuhiro Morone

National Center of Neurology and Psychiatry

P-5. Direct observation of ice-embedded cyanobacteria by using high voltage electron microscope equipped with Zernike phase plate.

Koji Nitta¹, Hideki Shigematsu¹, Radostin Danev¹, Youn-Jong Kim², Kuniaki Nagayama¹

1: Okazaki Inst. Integ. Biosci., 2: Korea Basic Sci. Inst.

P-6. Structural analysis of recombinant rat TRPV4 using cryo-transmission electron microscope equipped with Zernike phase plate.

Hideki Shigematsu¹, Takaaki Sokabe², Makoto Tominaga^{2,3}, Kuniaki Nagayama^{1,3}

1: Okazaki Inst. Integ. Biosci., 2: Okazaki Inst. Integ. Biosci., 3: The Grad. Univ. Adv. Studies

P-7. Analysis of cytoskeletal organization in retinal axons using a phase-contrast transmission electron microscopy.

Takafumi Shintani¹, Koji Nitta², Kuniaki Nagayama², Masaharu Noda¹

1:National Institute for Basic Biology, 2:Okazaki Institute for Integrative Bioscience

P-8. "Glutamatergic" hippocampal mossy fiber terminals in young rodents do not release GABA

Uchigashima, M¹, Fukaya, M¹, Watanabe, M¹, and Kamiya, H.²

Departments of Anatomy1 and Neurobiology2, Hokkaido University School of Medicine

P-9. Spine-type Specific Recruitment of Newly Synthesized AMPA Receptors with Learning

Naoki Matsuo^{1,2}, Mark Mayford¹

1:The Scripps Research Institute, 2:Fujita Health University

P-10. Left-Right Asymmetry of Hippocampal Pyramidal Cell Synapses

Yoshiaki Shinohara¹, Hajime Hirase², Nobuyuki Yamazaki³, Masahiko Watanabe⁴, Makoto Itakura⁵, Tsuyoshi Miyakawa³, Masami Takahashi⁵, Ryuichi Shigemoto^{1,6}

1:National Institute for Physiological Science, 2:RIKEN, BSI, 3:Kyoto University Faculty of Medicine, 4:Hokkaido University, 5:Mitsubishi Kagaku Institute of Life Sciences, 6:SORST

P-11. Input-specific intrasynaptic arrangement of the ionotropic glutamate receptors and its influence on properties of postsynaptic response

Yugo Fukazawa¹, Etsuko Tarusawa¹, Ko Matsui¹ and Ryuichi Shigemoto^{1,2}

1:National Institute for Physiological Sciences, 2:SORST

P-12. Resting Microglia Directly Monitor Synapses *in vivo* and Determine the Fate of Ischemic Terminals

Wake, Hiroaki., Moorhouse, Andrew., Jinno, Shozo., Kohsaka, Shinichi., & Nabekura, Junichi

National Institute for Physiological Sciences

P-13. Identification of the epilepsy-related LGI1 multiprotein complex

Yuko Fukata^{1,2}, Atsushi Watanabe³, Tsuyoshi Iwanaga¹ & Masaki Fukata^{1,2,*}

1: National Institute for Physiological Sciences, 2:PRESTO, JST, 3: National Institute for Longevity Sciences

P-14. Activity-Dependent Regulation of the PSD-95 Palmitoylating Enzyme

Jun Noritake¹, Yuko Fukata^{1,2}, Yoshiharu Matsuura⁴, Takao Hamakubo³, and Masaki Fukata^{1,2}

1:National Institute for Physiological Sciences, 2:PRESTO, 3:RCAST, The University of Tokyo, 4: Osaka University

P-15. The stress of mother-separation cause significant effects for development of dendritic spines in layer V pyramidal neuron in motor cortex

Yusuke Takatsuru, Junichi Nabekura

National Institute for Physiological Sciences

P-16. Neural progenitors cross the domain boundary (intermixing) in the ventricular zone and adjust transcription factor code and fate determination to those of the new environment

Katsuhiko Ono^{1,2,7}, Keisuke Watanabe^{1,2,6,7}, Hirohide Takebayashi^{1,2,7}, Noritaka Masahira^{1,3}, Kazuyo Ikeda^{1,4}, Takaki Miyata⁵, Kazuhiro Ikenaka^{1,2}

National Institute for Physiological Sciences

1, National Institute for Physiological Sciences, 2, Sokendai, 3, Kochi Medical School, 4, Kagawa University School of Medicine, 5, Nagoya University Graduate School of Medicine, 6, Kumamoto University, 7, Equal contribution to this work

International Symposium “Recent advances in glial research”

国際シンポジウム “Recent advances in glial research” は、2007 年 10 月 22 日に、山手 2 号館 2 階セミナー室において開催された。参加者数は 32 名であった。

近年グリア細胞が脳機能発現に重要な働きをしていることが明らかとなってきた。本シンポジウムではグリア機能にどのような新たな発見があったかについて 7 名の演者に発表してもらった。また、シンポジウム終了後討論を行い、意見交換を行った。グリア研究の重要性が改めて認識された。

Monday, October 22, 2007

Opening Remarks

1. Junichi Nabekura and Hiroaki Wake (NIPS)
Interaction between microglia and synapses; in vivo observation
2. Beth Stevens (Stanford Univ)
How are CNS synapses eliminated? A new role for glia and the innate immune system
3. Ryuuichi Shigemoto (NIPS)
Ultrastructural localization of glutamate receptors and transporters in Bergman glia cells
4. Joel M. Levine (SUNY)
Overcoming the glial barrier to axon regeneration
5. Yasunobu Okada (NIPS)
Roles of two types of anion channels in release of glutamate and ATP from astrocytes
6. Douglas Fields (NIH)
Activity-dependent myelination
7. Kazuhiro Ikenaka (NIPS)
Change in the character of microglia coinciding with myelin regeneration

Concluding Remarks