

## 未来開拓国際シンポジウム (第 32 回生理研国際シンポジウム)

未来開拓国際シンポジウム・第 32 回生理研国際シンポジウム「正常および病的状態の成体脳における神経新生」は、2004 年 11 月 11 - 13 日の 3 日間に、自然科学研究機構・山手 3 号館 2 階大会議室および岡崎ニューグランドホテルにおいて開催された。ヒトを含む哺乳類の脳の一部領域では、終生にわたって神経新生が起きており、脳機能の修飾に寄与することが知られている。成体脳における神経新生は様々な条件（例えばマウスを刺激の多いケージで飼育することや、ストレスを与えること）で変動するが、その分子機構は不明な点が少なくない。そこで、胎子期から成体に至るまでの脳における神経細胞・グリア細胞の産生および再生という幅広い研究領域について、世界の一線で活躍している国内外の研究者の交流を目指して企画された。実際、最先端の研究を行なっている研究者（海外より 7 名、国内より 13 名）に講演していただき、正常脳において神経新生が維持されているメカニズムや、病的状態における神経新生の変化などのトピックスについて、活発な討論が交わされた。これらの講演に加えて、立食パーティーを兼ねたポスターセッションも行った。22 題のポスターが展示され、打ち解けた雰囲気の中で、しかし真剣なディスカッションが行われた。最終的な参加者は総勢 80 名（海外より 10 名、国内より 70 名）で、まとまりの良いシンポジウムになった。また、若手の研究者にとっても、最先端の研究成果に触れるとともに、新たな共同研究を立ち上げる良い場となった。



### Thursday, November 11th

Opening Remarks

#### Session 1: The kinetics of adult neural stem/progenitor cells (Chairs: Derek van der Kooy / Seiji Hitoshi)

1. Derek van der Kooy (University of Toronto / Canada)  
The control of adult neural stem and progenitor cell proliferation.
2. Masayo Takahashi (Kyoto University / Japan)  
Neurogenesis in the damaged adult rat retina
3. Mari Dezawa (Kyoto University / Japan)  
Specific differentiation of functional neurons from bone-marrow stromal cells and application for a rat model of Parkinson's disease.

4. Kazunobu Sawamoto (Keio University / Japan)  
Migration of newly generated neurons in the adult mammalian brain.

**Friday, November 12th**

**Session 2: Adult neurogenesis in neurological disorders (Chairs: Jeff Macklis / Katsuhiko Ono)**

5. Hideyuki Okano (Keio University / Japan)  
Self-renewal of neural stem cells and CNS-repair.
6. Jeff Macklis (Harvard University / U.S.A.)  
Cellular repair of complex cortical circuitry by neural precursors and induction of neurogenesis.
7. Cindi Morshead (University of Toronto / Canada)  
Adult neural stem cells and their role in stroke recovery.
8. Hidemasa Kato (Tohoku University / Japan)  
Neural stem cell biotechnology as a tool for deciphering neurological problems.

**Session 3: Molecular basis for neurogenesis and gliogenesis (Chairs: Cindi Morshead / Kazuhiro Ikenaka)**

9. Stephen C. Noctor (Columbia University / U.S.A.)  
Patterns of neurogenesis and cortical assembly.
10. Nobuaki Tamamaki (Kumamoto University / Japan)  
Neurogenesis in the neocortical subventricular zone.
11. Ryoichiro Kageyama (Kyoto University / Japan)  
Roles of bHLH genes in neural development.
12. John A. Kessler (Northwestern University / U.S.A.)  
The role of  $\beta$ -catenin and BMP signaling in lineage commitment by neural stem cells.
13. Yukiko Gotoh (Tokyo University / Japan)  
Fate regulation of embryonic neural precursor cells.

**Saturday, November 13th**

**Session 4: Adult neurogenesis in psychiatric disorders (Chairs: René Hen / Kenji F. Tanaka)**

14. René Hen (Columbia University / U.S.A.)  
Contribution of hippocampal neurogenesis to the behavioral effects of antidepressants.
15. Shin Nakagawa (Hokkaido University / Japan)  
Depression and Neurogenesis.
16. Seiji Hitoshi (Natl. Inst. Physiol. Sci. / Japan)  
Neural stem cells in stress conditions.
17. Tatsuhiro Hisatsune (Tokyo University / Japan)  
Regulation of early steps in adult neurogenesis.

**Session 5: Neural fate determination in the developing brain (Chairs: John A. Kessler / Seiji Hitoshi)**

18. Takaki Miyata (Nagoya University / Japan)  
Asymmetric P/P divisions during CNS development: Their cytogenetic and histogenetic roles studied by slice culture.
19. Tetsuya Taga (Kumamoto University / Japan)  
Neuronal versus glial fate determination by cross-interactions among transcription regulatory systems.

## 20. Magdalena Götz (Max-Planck Institute / Germany)

Pax6 as a master control gene for neurogenesis from stem cells.

**Closing remarks****Poster Session 11-13 November, 2004**

- P-1. Takashi Namba<sup>1,2</sup>, Hideo Namiki<sup>2</sup>, Tatsunori Seki<sup>1</sup> (<sup>1</sup> Dept of Anat, Juntendo Univ Sch of Med, Tokyo, Japan, <sup>2</sup>Integrative Biosci and Biomed Eng, Sch of Sci and Eng, Waseda Univ, Tokyo, Japan.)  
Nature, cell-cell interaction and fate of hilar proliferating cells in the postnatal rat dentate gyrus
- P-2. Ryuta Koyama<sup>1</sup> Maki K. Yamada<sup>1</sup> Shigeyoshi Fujisawa<sup>1</sup> Ritsuko Katoh-Semba<sup>2</sup> Norio Matsuki<sup>1</sup> and Yuji Ikegaya<sup>1</sup> (<sup>1</sup>Laboratory of Chemical Pharmacology, Graduate School of Pharmaceutical Sciences, The University of Tokyo, Tokyo, Japan, and <sup>2</sup>Institute for Developmental Research, Aichi Human Service Center, Aichi, Japan)  
Brain-Derived Neurotrophic Factor Induces Hyperexcitable Reentrant Circuits in the Dentate Gyrus
- P-3. Masahiro Yamaguchi and Kensaku Mori (Department of Physiology, Graduate School of Medicine, University of Tokyo)  
Critical period for sensory experience-dependent survival and death of newly-generated granule cells in the adult mouse olfactory bulb
- P-4. R.X. Yamada, M.K. Yamada, N. Matsuki and Y. Ikegaya (Lab Chem Pharmacol, Grad Sch Pharmaceut Sci, Univ Tokyo, Tokyo, Japan)  
Sema3F-induced growth cone collapse: differential actions of cAMP on axons and dendrites of dentate granule cells
- P-5. S. Esumi and T. Yagi (KOKORO Biology group, Graduate School of Frontier Biosciences, Osaka University CREST, JST)  
Monoallelic yet combinatorial expression of variable exons of the CNR/Protocadherin- $\alpha$  gene cluster in single neurons
- P-6. Hirofumi Morishita<sup>1,2</sup>, Yoji Murata<sup>1</sup>, Shigeyuki Esumi<sup>1</sup>, Masahumi Kawaguchi<sup>1,2</sup>, Sonoko Hasegawa<sup>1</sup>, Chika Seiwa<sup>4</sup>, Shun Hamada<sup>1</sup>, Hiroaki Asou<sup>4</sup>, Takeshi Yagi<sup>1,2,3</sup> (<sup>1</sup>KOKORO Biology Group, Graduate School of Frontier Biosciences, Osaka University <sup>2</sup>Course of Medical Biosignaling, Graduate School of Medicine, Osaka University <sup>3</sup> Natl. Inst. Physiol. Sci. <sup>4</sup>Department of Neurobiology, Tokyo Metropolitan Institute of Gerontology)  
DYNAMIC EXPRESSION OF AXONAL CNR/PROTODADHERIN $\alpha$  FAMILY PROTEIN IN THE DEVELOPING NERVOUS SYSTEM
- P-7. M. Kawaguchi, T. Tohyama, and T. Yagi (KOKORO Biology group, Graduate School of Frontier Biosciences, Osaka University)  
The expression pattern of CNR/Pcdh $\alpha$  isoforms correlates with genomic methylation status.
- P-8. Masahiko Abematsu<sup>1,2</sup>, Tetsushi Kagawa<sup>1,3</sup>, Shinji Fukuda<sup>1,2</sup>, Toshihiro Inoue<sup>1,2</sup>, Hirohide Takebayashi<sup>4</sup>, Tetsuya Taga<sup>1,2</sup> (<sup>1</sup>Department of Cell Fate Modulation, Institute of Molecular Embryology and Genetics, Kumamoto University <sup>2</sup>The 21st Century COE program, Kumamoto University <sup>3</sup>Laboratory of Active Transport and <sup>4</sup>Div. Neurobiol. Bioinfo. Natl. Inst. Physiol. Sci.)  
bFGF Specifies Dorsoventral Cell Identity of Neuroepithelial Cells in Terms of Oligodendrocyte Differentiation Capacity
- P-9. Koji Shibasaki, Zhiyong Yang, and Lin Gan (Center for Aging and Developmental Biology, University of Rochester School of Medicine, Rochester, NY. )  
Dlx1 and Dlx2 Homeobox Factor Interact with POU Transcription Factor Brn-3b in Developing Mouse Retina
- P-10. Kim H-J, Hida H, Jung C-G, Miura Y, Nishino H (Dept. of Neuro-Physiol. & Brain Sci., Nagoya City Univ. Grad. Sch. Med. Sci., Nagoya, Japan.)  
Neuronal differentiation from neural stem/progenitor cells is promoted by the treatment with G1/S cell cycle blockers

- P-11. Shinsuke Shibata<sup>1</sup>, Shin-ichi Sakakibara<sup>2</sup>, Takao IMAI<sup>1</sup>, Hiroataka J Okano<sup>1</sup>, Hideyuki OKANO<sup>1,3</sup>, (<sup>1</sup>Department of Physiology, Keio University, School of Medicine, Japan. <sup>2</sup>Department of Histology and Neurobiology, Dokkyo University, School of Medicine, Japan. <sup>3</sup>CREST-JST, Japan)  
*In vivo* function of Musashi Family in mammalian CNS development
- P-12. Y. Tozuka<sup>1</sup>, S. Fukuda<sup>1</sup>, T. Seki<sup>2</sup>, T. Namba<sup>2</sup>, M. Yoshida<sup>1</sup>, Y. Miyamoto<sup>1</sup>, T. Hisatsune<sup>1</sup> (<sup>1</sup>Dept. Integrated Biosciences, Univ. Tokyo. <sup>2</sup>Dept. Anatomy, Juntendo Univ. )  
Excitatory GABAergic inputs accelerating cell-differentiation process in the early phase of adult hippocampal neurogenesis
- P-13. Toshihiro Inoue<sup>1,2</sup>, Tetsushi Kagawa<sup>2,3</sup>, Mikiko Fukushima<sup>1</sup>, Hidenobu Tanihara<sup>1</sup>, Tetsuya Taga<sup>2</sup> (<sup>1</sup>Department of Ophthalmology and Visual Science, Graduate School of Medical Sciences, and <sup>2</sup>Department of Cell Fate Modulation, Institute of Molecular Embryology and Genetics, Kumamoto University, Kumamoto, Japan. <sup>3</sup>Division of Active Transport, Natl. Inst. Physiol. Sci., Okazaki, Aichi, Japan. )  
Activation of canonical Wnt pathway promotes proliferation of retinal stem cells derived from adult mouse ciliary margin.
- P-14. Takeshi Shimizu<sup>1</sup>, Tetsushi Kagawa<sup>1</sup>, Shinji Takada<sup>2</sup>, Tetsuya Taga<sup>1</sup> (<sup>1</sup>Dept. Cell Fate Modulation, Inst. Mol. Embryol. Genet., Kumamoto Univ. <sup>2</sup>Cent. Integ. Biosci., Okazaki)
- Extrinsic factors regulate proliferation and differentiation of neural stem cells via the glycogen synthase kinase3  $\beta$  pathway.
- P-15. Atsushi Natsume<sup>1</sup>, Marina Mata<sup>2</sup>, Joseph C. Glorioso<sup>3</sup>, Hiroki Takeuchi<sup>4</sup>, Jun Yoshida<sup>4</sup>, and David J. Fink<sup>2</sup> (<sup>1</sup>Nagoya University Hospital, Center for Gene and Regenerative Medicine, <sup>2</sup>Department of Neurology, University of Michigan Ann Arbor, <sup>3</sup>Department of Molecular Genetics and Biochemistry, University of Pittsburgh, <sup>4</sup>Department of Neurosurgery, Nagoya University)  
Prolonged biologically active GDNF expression driven by the HSV LAP2 promoter protects dopaminergic neurons from 6-OHDA-induced neurodegeneration.
- P-16. K.F. Tanaka, H. Takebayashi, K. Ikenaka (Div. Neurobiol. Bioinfo., Natl. Inst. Physiol. Sci., Okazaki, Japan )  
Mutated GFAP dynamics in mouse primary astrocytes
- P-17. Yasuhiro Ogawa<sup>1</sup>, Matthew Rasband<sup>2</sup>, Hirohide Takebayashi<sup>1</sup>, Yasuno Iwasaki<sup>1</sup>, James Trimmer<sup>3</sup>, Kazuhiro Ikenaka<sup>1</sup> (<sup>1</sup> Natl. Inst. Physiol. Sci., <sup>2</sup>UCONN, <sup>3</sup>UC, Davis)  
Radial glial cells, astrocyte and ependymal cells express alpha-actinin-1
- P-18. L.Ding, K.F. Tanaka, H. Takebayashi, K. Ono, O. Chisaka, K. Ikenaka (Div. Neurobiol. Bioinfo., Natl. Inst. Physiol. Sci., Okazaki, Japan, )  
Dorsal-to-ventral migration of Olig3 lineage cells in the fetal mouse hindbrain and spinal cord
- P-19. N. Masahira<sup>1,2</sup>, L. Ding<sup>1</sup>, H. Takebayashi<sup>1</sup>, K. Ono<sup>1</sup>, K. Shimizu<sup>2</sup>, K. Ikenaka<sup>1</sup>, (<sup>1</sup>Div. Neurobiol. Bioinfo., Natl. Inst. Physiol. Sci., Okazaki, Japan, <sup>2</sup> Dept. Neurosurg., Kochi Med. Sch., Kochi, Japan)  
A long-term lineage analysis of Olig2-expressing cells by CreER<sup>TM</sup>/loxP system
- P-20. Masae Naruse<sup>1</sup>, Seiji Hitoshi<sup>1</sup>, Rashmi Bansal<sup>2</sup>, Kazuhiro Ikenaka<sup>1</sup> (<sup>1</sup> Natl. Inst. Physiol. Sci., <sup>2</sup>Department Neuroscience, University of Connecticut Medical School)  
Induction of ectopic *Olig2* expression in fetal cerebral cortex by FGF-2
- P-21. K. Watanabe<sup>1,2</sup>, K. Ikenaka<sup>1,2</sup> and K. Ono<sup>1,2</sup> (<sup>1</sup>Grad. Univ. Advanced Studies, Hayama, Japan, <sup>2</sup>Div. Neurobiol. Bioinfo., Natl. Inst. Physiol. Sci., Okazaki, Japan)  
The expression pattern of netrin-1, Sema3A and their receptors in the chick optic nerve
- P-22. Mikito Higashi, Seiji Hitoshi, Kazuhiro Ikenaka (Div. Neurobiol. & Bioinfo., Natl. Inst. Physiol. Sci., Okazaki, Japan)  
Oligodendroglial differentiation of neural stem cells in a demyelination model