

Japan-US Brain Research Cooperative Program
The Report of Information Exchange Seminar in 2007 fiscal year

[Field: Research on Glia- Neuron interaction]

1. The Seminar Title:

USA-JAPAN joint meeting for Glial Research

2. The Term: From 2008. March 17th To 2008. March 20th

3. The Location: Double Tree Hotel, Philadelphia, PA, USA

4. Representative's Name, Title and Affiliation

Japanese Coordinator

Yoshihisa Kudo, Ph.D.

Professor, School of Life Science, Tokyo University of Pharmacy and Life Science, 1432-1 Horinouchi, Hachioji, Tokyo 192-0392, Japan

US coordinator

Philip G. Haydon, Ph.D.

Professor and Director, Silvio Conte Center for Integration at the Tripartite Synapse
Director, Center for Dynamic Imaging of Nervous System Function, Department of Neuroscience,
University of Pennsylvania School of Medicine
215 Stemmler Hall
3610 Hamilton Walk, Philadelphia, PA 19104, USA

5. The participants

Japan; The invited participants **20** people, The others **0** people

- 1) Yasushi Enokiido Assoc.Prof. Tokyo Medical Dental Univ., Medical Research Inst.
- 2) Izumi Hide Assist. Prof. Hiroshima Univ. Grad.Sch. of Biomedical Science.
- 3) Hajime Hirase, Group Leader, RIKEN-Brain Science Inst.
- 4) Taiko Imura, Assist.Prof. Dept. of Neuroscience, Jikei Univ. Sch.of Medicine
- 5) Hiroshi Kato Prof. Dept. of Neurophysiology, Yamagata Univ. Sch. of Medicine
- 6) Shinichi Kohsaka, Inst.Head, National Inst. of Neuroscience
- 7) Schuichi Koizumi Prof. Univ. of Yamanashi, Faculty of Medicine
- 8) Yoshihisa Kudo, Prof. Tokyo University of Pharmacy and Life Sciences
- 9) Hiroyoshi Miyakawa, Prof. Tokyo Univ. of Pharmacy and Life Sciences
- 10) Mitsuhiro Morita, Assist. Prof. Tokyo University of Pharmacy and Life Sciences
- 11) Shigeo Okabe, Prof. Univ. of Tokyo, Grad. Sch. of Medicine

- 12) Keiko Ohsawa, Chief. Dept. of Neurochemistry, National Inst. of Neuroscience
- 13) Kaoru Sato, Chief. Div. of Pharmacology, National Inst. of Health Science
- 14) Takayuki Suzuki, PDR, Tokyo University of Pharmacy and Life Sciences
- 15) Masami Takahashi, Prof. Kitasato Univ. Sch. of Medicine •
- 16) Takako Takemiya, Lecturer, Tokyo Women's Medical Univ. Medical Research Inst.
- 17) Makoto Tsuda, Assoc. Prof. Kyushu Univ. Grad Sch. of Pharmaceutical Science
- 18) Keiji Wada Director, National Inst. of Neuroscience
- 19) Yoshihide Yamaguchi Assoc. Prof. Tokyo University of Pharmacy and Life Sciences
- 20) Yoshihiko Yamazaki, Assist. Prof. Yamagata Univ. Sch. of Medicine

USA: The Invited participants **21** people, The others **16** people

Name, Title and Affiliation of the Invited Participants

- 1) Anusha Mishra PDR, Dept of Neuroscience, University of Minnesota
 - 2) Ditte Lovatt PDR, Dept. of Neurology, University of Rochester
 - 3) Douglas Coulter Prof. Dept. of Pediatrics and Neurology, University of Pennsylvania
 - 4) Eric A. Newman Prof. Dept. of Neuroscience, University of Minnesota
 - 5) Erlend Naglhus PDR Dept of Neurosurgery, University of Rochester Medical Center
 - 6) F. Rob Jackson Prof. Dept of Neuroscience, Tufts University
 - 7) Graham Ellis-Davies Prof. Dept. of Pharmacology and Physiology, Drexel University
 - 8) Harald Sontheimer Prof. Dept. of Neurobiology, University of Alabama
 - 9) Joowon Suh PDR Dept. of Neuroscience, Tufts University
 - 10) Ken McCarthy Prof. Dept. of Pharmacology, University of North Carolina at Chapel Hill,
 - 11) Maiken Nedergaard Prof. Dept. of Neurological Surgery, University of Rochester
 - 12) Mark S. Forman Associate Director, Experimental Medicine, Merck Research Laboratories.
 - 13) Michelle Olsen PDR, Dept. of Neurobiology and Center for Glial Research
 - 14) Miho Teramura PDR, Dept. of Neuroscience, University of Pennsylvania
 - 15) Mike Halassa PDR, Dept of Neuroscience, University of Pennsylvania
 - 16) Philip G. Haydon Prof. Dept. of Neuroscience, University of Pennsylvania
 - 17) So-Young Lee PDR, Dept. of Neuroscience, University of Pennsylvania
 - 18) Stephen Traynelis Prof. Dept. of Pharmacology, Emon University
 - 19) Takahiro Takano, PDR, Dept. of Neurological Surgery, University of Rochester
 - 20) Tycho Hoogland Prof. Dept of Molecular Biology, Princeton University
 - 21) Vladimir Pappas Prof. Dept. of Neurobiology, University of Alabama
- PDR: Post doctoral researcher

6. The Abstract and the Significance of this seminar

Over the past decade there has been an acceleration of the pace of research on glial-neuron interactions with astrocytes being identified to play important roles in the regulation of synaptic transmission. As a consequence of this work we are now at a new and exciting time in which we are

forced to consider the concept of a role for glial cells in dynamic brain function. The challenge at hand is to determine the precise roles of these glial cells. To achieve this objective it will be essential to: i) identify a research agenda for the glial cell, ii) develop the experimental approaches to address these specific questions, and where necessary iii) to perform collaborative studies to address these critical questions.

In addition to the scientists who hold academic positions, we made every effort to integrate trainees in this meeting. Our goal is to invite an equal proportion of trainees to the meeting, and that they will participate along side the professors: they will present invited lectures and present their vision statements and be integrated in the discussion of the research agenda. It is our expectation that these trainees will develop collaborations with other laboratory members that will facilitate the development of their independent careers. Subsequent to this meeting the organizers will stimulate the exchange of trainees between US and Japanese laboratories.

7. The results of this seminar and its implication for future perspective

Since our seminar was held at Double Tree Hotel, where almost all attendees stayed, they (37 from USA and 20 from Japan) made tight contact with each other from breakfast to dinner time. Since the program for our seminar was arranged with enough time for presentation and discussion, we had vital discussion on each presentation.

The lectures by attendees from USA side were mainly focused on interactions among astrocytes, neurons and also blood vessels. They developed highly sophisticated experimental techniques and applied them according to their novel philosophy. The interesting and important topics were 1) the mechanisms and meanings of spatio-temporal gliotransmitter release, 2) the topics on the participation of astrocytes on circadian rhythm and sleep- wake cycle, 3) application of two photon techniques on 3D imaging and also on photolysis of caged compounds and 4) FACS-array as a new discovery tool to study glial gene expression in situ.

The topics presented by Japanese speakers were concerned astrocytes, microglia and also oligodendrocytes. They demonstrated 1) the participation of astrocytes on synaptic plasticity, 2) the important participation of oligodendrocytes as well as astrocytes on regulating neuronal functions, and 3) recent topics on the roles of microglia in physiological and pathological conditions.

We discussed as the common problem on the possible roles of glial cells on schizophrenia and the other neurological and psychiatric disorders and the difficulty of the researches on glial cells in vitro and in vivo. After the meeting we are convinced that the future collaboration between USA and Japan will promote the glia research and thus the understanding of the brain function.

As mentioned above, we invited many trainees to the meeting. Almost a half of speakers from USA and one third from Japan was trainees, who had less experiences for publishing their talk at international meetings. Actually, they presented their invited lectures very well. They showed their vision statements and were integrated in the discussion of the research agenda. They really developed their interaction and new collaborations with attendees from other laboratories. It is quite sure that such efforts will assist the development of their independent careers. We found the importance and

effectiveness of this kinds of meeting for future development of glial research, and reached a consensus that we should hold the joint meeting every other year. Next, the second meeting will be organized by Japanese researchers.

8) The others

One serious problem arisen during arranging this meeting was the date for meeting. We held it the middle of March this year according to the request from USA side, but the time was almost the end of 2007 fiscal year and schedule for the procedure of preparing required money for inviting attendees became very tight. We bother so much the administration office. We hope to establish special rule for dealing the fund free from the fiscal year in the case of this kind of international meeting.

We shall make a plan to hold the second USA-Japan joint meeting in Japan two years later. We shall make our best effort to get financial supports for the meeting, but it seems to be difficult to get enough money to hold the same level of meeting as this time.