

Japan-U.S. Brain Research Cooperation Program  
Group Joint Study Project Program FY2010 - FY2012: Report

Field: III

1. Principal Researcher

Name, Katsuhiko Nishimori

Title, Professor

Affiliation, Graduate School of Agriculture, Tohoku University

2. Project Title:

Study of the roles of OXTR in regulation of neurons synthesizing 5-HT in DR and MnR.

3. Japanese Group

Names, Titles and Affiliations of Principal Researcher and Collaborating Research Members

Katsuhiko Nishimori, Professor, Graduate School of Agriculture, Tohoku University

Shizu Hidema, Assistant, Graduate School of Agriculture, Tohoku University

Keisuke Sato, Doctor Course Student, Graduate School of Agriculture, Tohoku University

Maki Sasaki, Doctor Course Student, Graduate School of Agriculture, Tohoku University

4. U.S. Group

Names, Titles and Affiliations of Principal Researcher and Collaborating Research Members

Larry J.Young, Ph.D, Professor, Department of Psychiatry and Behavioral Science, Center for Behavioral,Neuroscience, Yerkes National Primate Center, Emory University School of Medicine

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5. Research Period, from/to (mm/dd/yyyy) and total number of years.

04/01/2010 to 3/31/2013

6. Abstract, Results, and Research Significance (300 words):

Recently, neurohypophysial hormone oxytocin (OXT) has been revalued with its functions, widely demonstrated as a neuromodulator, especially in the regulation of socio-sexual behaviors of mice. To further study this system we generated mice combined by Oxt<sup>fx/fx</sup> mice with ePet-Cre TG line, to specifically delete OXTR in 5-HT neurons. However, against to our first expectation, the crossed mice didn't show notable impairment in maternal behaviors nor social memory.

In parallel with this experiment, we generated adeno-associated virus (AAV) vector harboring oxytocin receptor (Oxt<sup>r</sup>) cDNA (AAV-Oxt<sup>r</sup>) and injected it into particular region in brain of Oxt<sup>r</sup> knockout mice, and showed the region-specific roles of OXTR in behavioral and physiological functions. In addition, we cleared up them injecting the AAV-Cre vector into the brain of floxed Oxt<sup>r</sup> KO mice.

In the laboratory of Prof. Larry J Young, they mostly used Prairie vole as major experimental animals for behavioral neuroscience. As Prairie voles are suitable and the next generation-type model animals to study the genetic basis for social behaviors. In this collaborative research, we introduced Prairie vole from his Lab into our Lab., and also learned how to feed and proliferate them, and necessary knowledge about Vole's developmental technology.

As Dr.Teruyama, a researcher in Louisiana state university, has an excellent technique and system of electrophysiology. To extend our research into physiology field, I went to his Lab., to learn punch/clump procedure using live brain section of animals. It was a great experience for me to further advance our experimental study.

7. Other (Research-related concerns, particular points of note):

The aim to obtain this grant was to extend our researches and to grow up young researchers, by expedite graduate course students in my Lab., who were major players of experimental researches in my Lab. In this meaning, Dr. Keisuke Sato, who could stay enough times in Prof.Larry Young's Lab., could be grown as an international researcher. However, and unfortunately, graduate course student MS, whom I also thought to be an important member of my Lab., after going to Larry's Lab. plural times, abruptly onset serious melancholy or schizophrenia and she withdrew from graduate course. It was a tragedy and a serious damage not only for her, but also for us to utilize this grant. Fortunately, recently the number of graduate course students who has an intense motivation increases, and if again we could obtain this-type grant, we will be able to nourish intensive and young researchers.

\*Please attach any reference materials as necessary.