Form 2-4-2

Japan-US Brain Research Cooperation Program

The Group Joint Study Report [field: ②]

1. The Representative of Group Joint Study:

Affiliation/ Title/ Name
Dept. of Biophysical Genetics, Kanazawa University,
Graduate School of Medical Science, /
Professor / Haruhiro Higashida

2. The Project Title:

Genome-wide analysis of genes responsible for network formation of
Peripheral and central nervous systems in *Drosophila*

3. Japanese Investigator's Name, Title, Affiliation and Phone Number:

Chief: Haruhiro Higashida, Professor, Kanazawa University Graduate School of Medicine, 076-265-2455

Collaborator: Shigeru Yokoyama, Associate Professor, Kanazawa University Graduate School of Medicine, 076-265-2457

4. U.S. Investigator's Name, Title, and Affiliation:

Chief: Marshall Nirenberg, Chief, Laboratory of Biochemical Genetics,
National Heart, Lung and Blood Institute

Collaborator:

5. The Term of Research: From Y. 2002 M.April D.1 To Y. 2005 M. March D. 31 (3 Years)

6. The Abstract, the Result and the Significance of Research(300 Words):

The purpose of this study is to identify new genes involved in the assembly of the nervous system of Drosophila. Two breakthroughs significantly simplify the search of new genes in fruit fly. First the whole genome has been sequenced, and second, injection of double-stranded RNA into early embryos results in the destruction of the corresponding species of mRNA. Thus some embryos exhibit mutant phenotypes. This phenomenon termed RNA interference(RNAi) provides a relatively rapid way to explore gene functions. In this study, partially sequenced cDNA clones will be used to synthesize double-stranded RNAs. 5800 dsRNAs were injected in Drosophila embryos at early stages of development. Injected embryos were fixed at the 14-16 stages of embryonic development and the nervous system was stained with the neurospecific antibody 22C10 to visualize the nervous system. We identified 52 genes, with is about 1% of the genes that were screened. We found 20 genes that were not known previously to affect the development of the nervous system. Other genes encode protein kinases, transcription factors, and signaling proteins, as well as proteins with other functions. Some of there genes are identical to those of mental retardation.

7. The Others (Practical Issues, Special Mention Matters):