

**JSPS Core-to-Core Program**  
**FY2007 Implementation Plan (Project No. : 17005 )**

Research Theme Human disease-related functional glycomics initiative  
 Duration of Project 2007/4/1 - 2010/3/31 ( 36 months)  
 Core Institution in Japan (Co-Chair) Osaka University  
(Naoyuki Taniguchi)

**Implementing Organizations**

**Japan**

Japan	Core Institution	Osaka University	
	Co-Chair (name and title)	Naoyuki Taniguchi (Professor Emeritus)	
	Cooperating Institutions	RIKEN, The University of Tokyo, Aichi Cancer Center, Nagoya University, National Institute of Advanced Industrial Science and Technology, Osaka Medical Center and Research Institute for Maternal and Child Health, Ritsumeikan University, Kochi University, Tokyo Metropolitan Institute of Gerontology, Yamaguchi University, Sapporo Medical University, Fukushima Medical University, Kinki University, Soka University, Tohoku Pharmaceutical University, Nagoya City University	Number of Cooperating Institutions  16

**Partner Countries**

USA	Core Institution	The Scripps Research Institute	
	Co-Chair (name and title)	James Paulson (Professor)	
	Cooperating Institutions	The Burnham Institute, University of Washington, The State University of New York at Stony Brook, Johns Hopkins University, University of California, Indiana University, University of Georgia, Albert Einstein College of Medicine, University of Iowa, Yale University	Number of Cooperating Institutions  10

Germany	Core Institution	German Cancer Research Center	
	Co-Chair (name and title)	Wilhelm von der Lieth (Professor)	
	Cooperating Institutions	Hannover Medical University, University of Muenster, Freie University Berlin, University of Kiel, University Goettingen, University Stuttgart	Number of Cooperating Institutions  6

**Objectives of Research Exchange (including the five years after the project finishes)**

There is growing evidence that the sugar chains are associated with the pathogenesis of various kinds of diseases such as cancer, inflammatory diseases, life style-related diseases, and neuromuscular diseases. However, the direct function of sugar chains in these diseases remains mostly uncertain. This has been mainly due to the difficulty in analyzing carbohydrate chains on glycoproteins. The aim of this project is to share information with other leading countries (USA and Germany) about the protocol of structural elucidation of glycan chains (*N*- and *O*-linked glycans) and to establish standard protocol which is open to any researcher. By accumulating and comparing individual data about the carbohydrate structure related with various diseases, an international data platform will be established, which is ultimately indispensable to identify glycomarkers as next generation ones.

The initiative will also foster young scientists to grasp the advances of functional glycomics by their attendance at international meetings.

**Results to the present****Joint Research**

The pilot study aimed at establishment of international standard protocol about analysis of *N*-linked sugar chains was successfully completed and published. This achievement is of a significant importance, since the progress of glycomics has been mainly hampered by the difficulty of analysis of carbohydrate chains on glycoproteins.

Wada-Y et al., Comparison of the methods for profiling glycoprotein glycans--HUPO Human Disease Glycomics/Proteome Initiative multi-institutional study. *Glycobiology*. 2007 Apr;17(4):411-22.

**Seminar**

Totally five international symposia (HGPI : human disease-related functional glycomics initiative) were held by virtue of this grant. We supported young researchers to attend these international meetings.

2005

July 31<sup>st</sup> : HGPI Steering Committee (Osaka, Japan)

September 3-4<sup>th</sup> : the 2<sup>nd</sup> HGPI meeting together with our German partner (Florence, Italy)

November 9<sup>th</sup> : the 3<sup>rd</sup> HGPI meeting together with our USA partner (Boston, USA).

2006

September 10-13<sup>th</sup> : the 4<sup>th</sup> HGPI meeting together with our USA partner (NIH, MD, USA).

October 29<sup>th</sup> : the 5<sup>th</sup> HGPI meeting at HUPO meeting (Long Beach, CA, USA).

All of the information of these activities can be available at <http://www.hgpi.jp>

**Researcher Exchanges**

A number of graduate students and post-doctoral fellows were sent abroad in the frame of collaborative work to learn the advanced technology to analyze carbohydrate structure and bioinformatics.

## Summary of FY 2007 Exchange Plan

### **Joint Research**

The pilot study aimed at establishment of standard protocol about analysis of *N*-linked sugar chains was successfully completed and published last year (see above). To extend this achievement, the following joint researches are planned this year (2007).

(1) Advancing this international collaborative work for *O*-linked sugar chains. We have already delivered a model glycoprotein to several laboratories in USA and Germany for this multi-institutional study. To mining all of the data, we will have a steering committee meeting at Germany (September 7<sup>th</sup>, Lübeck).

(2) Disease-oriented functional glycomics, and identification of sugar biomarkers.

### **Seminar**

The following international symposiums (HGPI : human disease-related functional glycomics initiative) will be held with our partner consortia (USA and Germany). We will especially support young researchers to attend and present their own research at these international meetings.

September : the 6<sup>th</sup> HGPI meeting together with our German partner (Lübeck, Germany)

November : the 7<sup>th</sup> HGPI meeting at American glycobiology meeting (Boston, USA).

In terms of educational view especially for young students (master and doctor course students), we will have lecture-style meeting this summer (Sapporo, July 11-13<sup>th</sup>). They can overview the recent progress of glyco- and cancer biology.

### **Researcher Exchanges**

Since this researcher exchanges are one of the most important cores of this program, we keep encouraging young researchers (graduate students and post-doctoral fellows) to carry out individual experiments abroad so that they can learn and grasp the concept of functional glycomics.

August 30-31<sup>st</sup> : Bioinformatics Seminar at Heidelberg (chaired by Dr. von der Lieth, the coordinator of German core institution)