

JSPS Core-to-Core Program
FY2008 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 (Endowed Chair Professor, Professor Emeritus)	
	Cooperating Institutions	The University of Tokyo, Nagoya University, Kochi University, Yamaguchi University, Sapporo Medical University, Tokai University, Kinki University, RIKEN, Aichi Cancer Center, National Institute of Advanced Industrial Science and Technology, Tokyo Metropolitan Institute of Gerontology, Osaka Medical Center and Research Institute for Maternal and Child Health, Ritsumeikan University, Fukushima Medical University, Tohoku Pharmaceutical University, Soka University, Kyoto University, Hyogo College of Medicine, Hyogo University of Health Sciences, Osaka Medical College	Number of Cooperating Institutions
			20

○ 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, National Institutes of Health (NIH), University of New Hampshire, Boston University School of Medicine, University of Alabama at Birmingham	Number of Cooperating Institutions
			14

Germany	Core Institution	German Cancer Research Center	
	Co-Chair (name and title)	Wilhelm von der Lieth* (Professor) * Since Prof. von der Lieth passed away last year, Dr. Martin Frank at German Cancer Research Center is temporarily taking the role as Co-Chair up to 2008/December.	
	Cooperating Institutions	Hannover Medical University, University of Muenster, Freie University Berlin, University of Kiel, University Goettingen, University Stuttgart, University of Giessen, Max Plank Institute (Dressden)	Number of Cooperating Institutions
			8

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 glycobiomarkers 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.

Since last year (2008), we set out another project aiming at establishment of international standard protocol about analysis of *O*-linked sugar chains.

* 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

Seven international symposia (HGPI : human disease-related functional glycomics initiative) were held by virtue of this grant since year 2005. We supported young researchers to attend these international meetings.

2005

July 31st: HGPI Steering Committee (Osaka, Japan)

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

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

2006

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

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

2007

September 7th: the 6th HGPI meeting together with our German partner (Lubeck, Germany).

October 6th: the 7th HGPI meeting at HUPO meeting (Seoul, KOREA).

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 2008 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 (2008).

(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.

(2) Disease-oriented functional glycomics, and identification of sugar biomarkers. We will hold a Joint Meeting with NIH regarding this issue at March/2009 (see below : "Seminar").

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.

November/2008: the 8th HGPI meeting at American glycobiology meeting (Texas, USA).

March/2009: the 9th HGPI meeting with NIH (Ise-Shima, Japan)

In terms of educational view especially for young students (master and doctor course students), we will have a lecture-style meeting at the 9th HGPI meeting (Ise-Shima). 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 attend at international glycobiology meetings so that they can learn and grasp the concept of functional glycomics.