

**JSPS Core-to-Core Program**  
**FY2008 Implementation Plan (Project No.18006)**

**Research Theme** Stem Cells and Cancer Stem Cells

**Duration of Project** 2008.4.1 – 2011.3.31 ( 36 months)

**Core Institution in Japan (Co-Chair)** Keio University  
(Prof. Toshio Suda )

**Implementing Organizations**

○ **Japan**

Japan	Core Institution	Keio University	
	Co-Chair (name and title)	Toshio Suda	
	Cooperating Institutions		Number of Cooperating Institutions
			0

○ **Partner Countries**

Sweden	Core Institution	Lund University	
	Co-Chair (name and title)	Stefan Karlsson, Professor	
	Cooperating Institutions		Number of Cooperating Institutions
			0

Sweden	Core Institution	Karolinska institutet	
	Co-Chair (name and title)	Sten Lindahl, Director	
	Cooperating Institutions		Number of Cooperating Institutions
			0

UK	Core Institution	University of Oxford	
	Co-Chair (name and title)	Sten Eirik Jacobsen, Professor	
	Cooperating Institutions		Number of Cooperating Institutions
			0

USA	Core Institution	MD Anderson Cancer Center	
	Co-Chair (name and title)	Naoto Ueno, Associate Professor	
	Cooperating Institutions		Number of Cooperating Institutions
			0

USA	Core Institution	Stowers Institute for Medical Research	
	Co-Chair (name and title)	Linheng Li, Associate Investigator	
	Cooperating Institutions		Number of Cooperating Institutions
			0

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

Stem cell, holding self-renewal activity, causes tissue formation. It is divided broadly into tissue stem cell which causes normal tissue and embryonic stem cell which is produced from embryos. There are a tremendous amount of researches on stem cells have been conducted in many countries aiming for regenerative medicine. We propose “choice and concentration” program instead of “omnidirectional” research system, with the main aim of fundamental research of tissue stem cell and its clinical application focusing on cancer and regenerative medicine. At “Integrated Action Initiative” program, we promoted our research focusing on hematogenesis and neural stem cell to accomplish the significant discovery regarding stem cell niche and molecular mechanism both at Lund University and Keio University ultimately. Also at “Strategic Research Network” program, we are going to continue “choice and concentration” researches with 5 core institutions in Sweden, UK and US. This is to say, the aim of our research is to demonstrate dynamics of normal stem cells and cancer stem cells focusing on “How tissue stem cells stay as stem cells.” These researches are expected to reach fruition as expansion of stem cells and drug discovery of cancer stem cells inhibitor 5 years later.

## Results to the present

### **Joint Research**

Because of the complimentary discover that signals of Thrombopoietin (Thpo) · Mpl relates effects quiescence hematopoietic stem cells, Laboratory of Dr. Suda, Keio University and Laboratory of Dr. Jacobson, Lund University submitted both of the following articles at the same time.

• Yoshihara et al.

The Niche Regulation of Quiescent Hematopoietic Stem Cells through Thrombopoietin / Mpl Signaling

• Qian et al.

Critical Role of Thrombopoietin in Maintaining Postnatal Quiescent Hematopoietic Stem Cells

These 2 articles were published in the same issue of Cell Stem Cell due to their association.

### **Seminar**

In November 2007, there was a symposium held about neural stem cell and hematopoietic stem cells at Sweden Embassy with the attendance of researchers of Lund University, Karolinska institutet and Tokyo University.

### **Researchers Exchanges**

Young researchers were sent to core institution and attended international conferences in the stem cell field (i.e. ISSCR: International Society of Stem Cell Research) and symposiums such as Keystone Symposia and Gordon Research Conferences at which young elite researchers gather. Besides making presentations, they successfully deepen exchanges with the researchers to establish the network for the future collaboration in the stem cell field.

## Summary of FY 2008 Exchange Plan

### Joint Research

Keio University is going to promote researches on stem cells and cancer stem cells such as cooperative researches with the following core institutions through “Strategic Research Network” program.

Lund University: It will conduct a research on stem cells at “choice and concentration” approach. It will continuously develop the cooperative research in hematogenesis, cancer stem cells, and neuroscience. A student in the doctoral program of Laboratory of Dr. Karlsson will visit Keio University for 2 weeks of April in order to conduct the cooperative research on hematogenesis niche.

Karolinska institutet: Due to its superiority at neuroscience research, its research will be emphasized on neural stem cell and metabolic system of stem cells.

Oxford University: Keio University will continue the cooperative research with Dr. Jacobson of Weatherall Institute for Molecular Medicine (a former professor at Lund University), which is superior in the field of hematogenesis and haematologic disease.

MD Anderson Cancer Center: It is one of the world-leading clinical cancer research centers located in Houston, US. Keio University will promote academic exchange on cancer researches through the exchange of young researchers. 2 young researchers will be sent to MDACC for some months. The cost will be partly born by the matching fund of MDACC.

Stowers Institute for Medical Research: It is a medical research center which was established in 2000 in Kansas City, US. Keio University will conduct a cooperative basic research on development biology and stem cells niche.

### Seminar

“US-Japan Joint Seminar on Leukemogenesis” (4 days in March,2009)

Researchers of leukemic stem cells and hematopoietic stem cells of US and Japan gather at Hawaii for the intensive discussion. 20 researchers, 9 research institutes in US and 8 research institutes in Japan, including Dr. Liheng Li of Stowers Institute for Medical Research and Dr. Naoto Ueno of MD Anderson Cancer Center will attend the seminar.

### Academic Exchange

Besides academic exchange between the core institutions, it is also significant to attend international conferences regarding stem cells and cancer stem cells and to communicate with researchers of advanced research institutes in the world. Through such actions, we will be able to obtain diverse opinions from diverse fields and to expand the relationship efficiently and effectively. Major plans are as following.

- ESH (European Hematology Association) Angiogenesis Meeting : Paris  
Meet Dr. Besholtz of Karolinska institutet
- ISSCR (International Society for Stem Cell Research) : Philadelphia
- ISEH (International society for Experimental Hematology) : Boston  
Meet Dr. Karlsson of Lund University
- Basic Cardiovascular Sciences Conference (American Heart Association) : Keystone
- SFN (Society for Neuroscience) : Washington DC
- ASH (American Society of Hematology) : San Francisco

### Training program for young researchers

Keio University will hold Summer School in collaboration with Karolinska institutet under Global COE program “Center for Human Metabolic Systems Biology” in July. 4 professors and 6 students from Karolinska institutet will join the program. They are supposed to participate in one-week-intensive lectures and four-week-laboratory work to promote academic exchange of young researchers between 2 universities.