

**JSPS Core-to-Core Program**  
**FY2010 Implementation Plan (Project No. :19004)**

Research Theme Center for Magnetic Resonance Molecular Imaging of In Vivo Redox System  
 Duration of Project 2009/4/1-2012/3/31 (36 months)  
 Core Institution in Japan (Co-Chair) Kyushu University  
(Keiji YASUKAWA, Assistant Professor)

**Implementing Organizations**

○ **Japan**

Japan	Core Institution	Kyushu University	
	Co-Chair (name and title)	Keiji YASUKAWA, Assistant Professor	
	Cooperating Institutions	Hokkaido University Nagasaki University Kumamoto University Sojo University National Institute of Radiological Sciences	Number of Cooperating Institutions  5

○ **Partner Countries**

USA	Core Institution	The Ohio State University	
	Co-Chair (name and title)	Periannan Kuppusamy, Professor	
	Cooperating Institutions	NIH/NCI University of Chicago	Number of Cooperating Institutions  2

UK	Core Institution	University of Aberdeen	
	Co-Chair (name and title)	David J. Lurie, Professor	
	Cooperating Institutions		Number of Cooperating Institutions  0

Germany	Core Institution	Martin Luther University of Halle-Wittenberg	
	Co-Chair (name and title)	Karsten Mäder, Professor	
	Cooperating Institutions	University of Applied Sciences TFH Berlin University of Kaiserslautern	Number of Cooperating Institutions  2

Australia	Core Institution	Monash University	
	Co-Chair (name and title)	Kerry Hourigan, Professor	
	Cooperating Institutions	University of Queensland The Heart Research Institute	Number of Cooperating Institutions
			2
China	Core Institution	Chinese Academy of Science	
	Co-Chair (name and title)	Baolu Zhao, Professor	
	Cooperating Institutions		Number of Cooperating Institutions
			0

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

With addition of Germany, Australia, and China to the "Strategic Research Networks", we will create international network of magnetic resonance molecular imaging for *in vivo* redox. This program aims at the cultivation of next leaders, the establishment of magnetic resonance molecular imaging technique for *in vivo* redox, and finally standardized protocol of magnetic resonance imaging directed to human health. It is expected that the establishment of molecular imaging technique will contribute to the construction of new academic field "Spin Biology" and health and medicine for human.

## Results to the present

The research collaboration of 4 subgroups, which are "Synthesis of probes for *in vivo* redox imaging", "Development of MRI and redox imager", "Imaging redox *in vivo* using magnetic resonance imager", and "Imaging analysis of redox in tumor", have been carried out, and 3 joint papers have already published or accepted.

Four seminars were held in FY2009, and the attendees have reached to be totally 81 researchers and students. Free Radical School 2009 in Japan was held in Niigata on 2-6, September and jointed with Society of Free Radical Research (SFRR). Young core-to-core students studied with Asian young students of SFRR members about the basics of redox biology, chemistry and imaging, and obtained English communication skill. Through the Oxygen Club of California 2010 World Congress, the activities of core-to-core program became well-known to the attendees from other countries and lead to establish the international network of magnetic resonance molecular imaging study.

## Summary of FY 2010 Exchange Plan

### **Joint Research**

In FY 2010, the following collaborative researches will be carried out.

1. Development of MRI and redox imager
2. Synthesis of *in vivo* redox probe
3. Imaging of redox status *in vivo* in disease
4. Standardization of research protocol on magnetic resonance molecular imaging for *in vivo* redox

In order to encourage scientific activities, *in vivo* redox meeting will be held at institutes of coordinators. The homepage of redox core will be rearranged and expanded, and new information on collaborative research, seminar, and young exchange visitors will be posted on the homepage of redox core and so on.

### **Seminar**

In the first of May, Core-to-Core symposium will be held in Puerto Rico, USA (Organizer: Prof. P. Kuppusamy, US coordinator), and the cutting-edge findings on *in vivo* redox imaging research will be presented by the selected presenters and discussed with attendees. In this summer, the *in vivo* redox meeting will be held in Germany, and at the meeting discussion on the research technique of imaging application for drug delivery system and the organic synthesis of spin-labeled compounds will be carried out. Furthermore, in this autumn and winter, collaborative research on the development of *in vivo* redox imager and the application for cardiovascular diseases and the common protocol on these techniques will be discussed with coordinators in the counterpart side at *in vivo* redox meeting(s).

### **Researcher Exchanges**

In the young exchange program, the selected visitors can visit to the laboratories in USA, UK, Germany, Australia, and China for 1-3 months. They will be awarded "JSPS Core-to-Core Young Investigator Award 2010". After the completion of exchange program, all report articles written in both English and Japanese will be compiled as a report of JSPS Core-to-Core exchange visitors and delivered to core-to-core members.

In the Core-to-Core symposium at Puerto Rico, educative lecture for young researchers will be also held.

The financial support for attending international workshop for doctoral course students or postdoctoral fellows will be scheduled.