

JSPS Core-to-Core Program
FY2011 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 reasearch 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 activity of core-to-core program became to be well known to the attendees from other countries and lead to establish the international network of magnetic resonance molecular imaging study.

Summary of FY 2011 Exchange Plan

Joint Research

In FY 2011, 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 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 November, Core-to-Core workshop on *in vivo* redox will be held in Fukuoka, Japan. At the workshop, the cutting-edge findings will be presented and discussed with attendees as a result of joint researches and the protocol of *in vivo* redox imaging will be also summarized, aiming for the establishment of international research network on redox imaging. In this summer, the *in vivo* redox meeting will be held in Australia, and at the meeting, discussion on the joint research and the protocol of the application of redox imaging technique on the analysis of structure and function of redox-related enzymes and redox imaging of heart diseases will be carried out.

Researcher Exchanges

In the young exchange program, we will dispatch selected students/researchers 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 2011". 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.

Autumn School on Redox Biology, Chemistry & Imaging will be held in Fukuoka, and the school is aimed for the education of young researchers to become next-generation leaders of international network on redox imaging research.

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