

Project No.:19004 Core Institution in Japan:Kyushu University
--

**JSPS Core-to-Core Program  
-Strategic Research Networks-  
FY2011 Research Report**

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	Kyushu University

**Implementing Organizations**

Country	Japan
Core Institution	Kyushu University
Co-Chair (name and title)	Keiji YASUKAWA, Assistant Professor
Number of Cooperating Institutions	5
Cooperating Institutions	<ul style="list-style-type: none"> <li>•Hokkaido University</li> <li>•Kumamoto University</li> <li>•Nagasaki University</li> <li>•Sojo University</li> <li>•National Institutes of Radiological Science</li> </ul>

Country	USA
Core Institution	The Ohio State University
Co-Chair (name and title)	Periannan Kuppusamy, Professor
Number of Cooperating Institutions	2
Cooperating Institutions	<ul style="list-style-type: none"> <li>•NIH/NCI</li> <li>•University of Chicago</li> </ul>
Matching Fund	<ul style="list-style-type: none"> <li>• National Institutes of Health, Development of spin probes for cell-targeting and oximetry, \$ 225,000/year, 2008/9/1 – 2012/8/31</li> <li>• National Institutes of Health, Noninvasive monitoring of in situ oxygenation and cell therapy in infarct heart, \$ 225,000/year, 2007/7/1 – 2011/6/30</li> <li>• National Institutes of Health, Novel trityl probes for measurement and bi-modal imaging of superoxide, \$ 180,000/year, 2008/7/1 – 2012/6/30</li> </ul>

Country	UK
Core Institution	University of Aberdeen
Co-Chair (name and title)	David J. Lurie, Professor
Number of Cooperating Institutions	0
Cooperating Institutions	
Matching Fund	<ul style="list-style-type: none"> <li>RCUK/EPSRC, Fast Field-Cycling Magnetic Resonance Imaging, £ 607,130/year, 2007/5/1– 2011/4/30</li> <li>Arthritis Research UK, Assessment of FFC-MRI for the Imaging of Articular Cartilage and Osteoarthritis, £ 95,000/year, 2011/11/1 – 2013/10/31</li> <li>RCUK/EPSRC, Physical Organic Chemistry: Opprotunities in Synthesis, Materials and Pharmaceuticals, £ 531,000/year, 2007/10/31 – 2012/10/30</li> </ul>

Country	Germany
Core Institution	Martin Luther University of Halle-Wittenberg
Co-Chair (name and title)	Karsten Mäder, Professor
Number of Cooperating Institutions	2
Cooperating Institutions	<ul style="list-style-type: none"> <li>• University of Applied Sciences TFH Berlin</li> <li>• University of Kaiserslautern</li> </ul>
Matching Fund	Institute of Pharmacy, Martin-Luther-University Halle plus money from own research projects (industry supported), Basic Research, €10,000/year

Country	Australia
Core Institution	Monash University
Co-Chair (name and title)	Kerry Hourigan, Professor
Number of Cooperating Institutions	2
Cooperating Institutions	<ul style="list-style-type: none"> <li>• University of Queensland</li> <li>• The Heart Research Institute</li> </ul>
Matching Fund	<ul style="list-style-type: none"> <li>• Australian Research Council, Centre of Excellence in Free Radical Chemistry and Biotechnology, 210,000AUD/year, 4 year</li> <li>• Australian Research Council, Mechanisms and consequences of myeloperoxidase-mediated damage to glycosaminoglycans, proteins and proteoglycans, 175,000AUD/year, 4year</li> <li>• NHMRC, Heme-oxidised soluble guanylyl cyclase, a mechanism-based target for vascular diagnostics and vasoprotective therapy, 164,000AUD/year, 1 year</li> <li>• NHMRC, Novel treatment strategies for cardiovascular diseases, 104,000AUD/year, 2year</li> <li>• NHMRC, Underlying mechanisms of cardiovascular disease, 159,000AUD/year, 2 year</li> </ul>

Country	China
Core Institution	Chinese Academy of Sciences
Co-Chair (name and title)	Yang Liu, Professor
Number of Cooperating Institutions	0
Cooperating Institutions	
Matching Fund	<p>Department of National Science and Technology of China, New techniques of Provent and treatment against AD and PD., 100,000RMB/year, 2008-2010</p> <p>National Natural Sciences Foundation of China, Effect of cupper on the C elegans A β -expressing strain and Mechanism, 1,700,000RMB/year, 2009/1-2011/12</p> <p>National Natural Sciences Foundation of China, Study on the mechanism of iron accumulation in the brain of Parkinson's disease, 640,000RMB/year, 2009/1-2013/12</p>

## Result of Program Implementation

### – Collaboration –

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 8 joint papers have already published or accepted.

### – Seminar –

Four seminars were held in FY2011, and the attendees have reached to be totally 160 researchers and students. Winter School in Fukuoka 2012 was held in Fukuoka on February 4th, 2012 for the education of young researchers domestic and overseas. The final seminar entitled "International Redox Core Symposium on In Vivo Magnetic Resonance Imaging" was held in Fukuoka on February 5th – 6th, 2012 and coordinators in Japan side and counter-part side and professors reported the overview of our Core-to-Core exchange results.

## Achievements in FY2011 (Self Review)

The activities of in vivo redox research core have aggressively been promoted, and the goal in FY2011 was achieved as shown below.

### – Research Result –

Young and senior researchers carried out collaborative research among USA, UK, Germany, Australia and China via meetings and contact deeply using telephone and e-mail. In FY2011, six papers were published, collaborating with Core-to-Core research groups such as NIH/NCI, The Ohio State University, and Kyushu University.

### – Education of young researchers –

The 6 young exchange visitors skilled up the research techniques and the communication with researchers in USA and Germany during their stay for 1-2 months. Reports of young exchange visitors were distributed to most of overseas and Japanese core-to-core members.

### – Ripple Effect of This Program –

The people, who visited the homepage of "Center for Magnetic Resonance Molecular Imaging of In Vivo Redox System", has reached to be 5578 since the opening of site.

## Future Plan (Measures toward Achieving Research Objectives)

The research network of in vivo redox imaging with counterpart countries was almost established in the end of this Core-to-Core program; however it is afford to develop this research network. It is necessary to expand the international network toward the further progress in the research field. Also after the end of the support by this program, Kyushu University will take the leading role in the close exchange with counterpart countries and aggressive promotion of the collaborative research, presentation and education for PhD students and postdoctoral fellows by using of other project such as Innovation Center for Medical Redox Navigation.

We will try to develop the international network by the publishing of research protocol of redox imaging written in English and the transmission of information on our exchange activity toward the world via internet.