

JSPS Core-to-Core Program -Strategic Research Networks-
FY2010 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"> •Hokkaido University •Kumamoto University •Nagasaki University •Sojo University •National Institutes of Radiological Science

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"> •NIH/NCI •University of Chicago
Matching Fund	<ul style="list-style-type: none"> • National Institutes of Health, Development of spin probes for cell-targeting and oximetry, \$ 225,000/year, 2008/9/1 – 2012/8/31 • 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 • National Institutes of Health, Novel trityl probes for measurement and bi-modal imaging of superoxide, \$ 180,000/year, 2008/7/1 – 2012/6/30

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	RCUK/EPSRC, Fast Field-Cycling Magnetic Resonance Imaging, £ 607,130/year, 2007/5/1– 2011/4/30

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

Country	China
Core Institution	Chinese Academy of Science
Co-Chair (name and title)	Baolu Zhao, Professor
Number of Cooperating Institutions	0
Cooperating Institutions	
Matching Fund	Department of National Science and Technology of China, New techniques of Provent and treatment against AD and PD., 100,000RMB/year, 2008-2010

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 7 joint papers have already published or accepted.

– Seminar –

Four seminars were held in FY2010, and the attendees have reached to be totally 57 researchers and students. Winter School in Fukuoka, Japan was held in Fukuoka on 8–10, January. This seminar entitled "Center for Magnetic Resonance Molecular Imaging of In Vivo Redox" is heavily oriented toward education of young researchers such as young international exchange project for 1–2 months. The advanced research toward clinical application would be required to achieve the final goal, which is the establishment of international network in the research field of magnetic resonance molecular imaging. This Winter School aimed for training young researchers to get the ability to research toward clinical application and discuss with each other in English.

Achievements in FY2010 (Self Review)

The activities of in vivo redox research core have aggressively been promoted, and the goal in FY2010 was achieved as shown below.

– Research Result –

Young and senior researchers carried out collaborative research among USA, UK, Germany, and Australia via meetings and contact deeply using telephone and e-mail. In FY2010, seven 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, UK, and Australia 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 4608 since the opening of site.

Future Plan (Measures toward Achieving Research Objectives)

We will achieve the establishment of international network of magnetic resonance molecular imaging study and make the standard protocol of in vivo redox imaging directed to human health. To achieve the final goal, the collaborative research will be promoted and carried out the productive publication of joint papers. The core-to-core activity will spread around by effective usefulness of core-to-core homepage and next leaders of next generation will be grown up through young exchange program and school for young researchers.