

Project No. : 16003 Core Institution in Japan: Tokyo Medical and Dental University

**JSPS Core-to-Core Program Strategic Research Networks-
FY2006 Research Report**

Project No.	16003
Research Theme	Advanced Molecular Pathophysiology of Bone and Cartilage Diseases
Duration of Project	2006/4/1 - 2009/3/31
Core Institution in Japan	Tokyo Medical and Dental University

Implementing Organizations

Country	Japan
Core Institution	Tokyo Medical and Dental University
Co-Chair (name and title)	Masaki Noda, Professor
Number of Cooperating Institutions	1
Cooperating Institutions	University of Tokyo

Country	United State of America
Core Institution	Harvard University
Co-Chair (name and title)	Henry Kronenberg, Professor
Number of Cooperating Institutions	3
Cooperating Institutions	Harvard Medical School Stanford University University of Dayton
Matching Fund	NIH

Country	Canada
Core Institution	Tronto University
Co-Chair (name and title)	Jane E Aubin, Professor
Number of Cooperating Institutions	0
Cooperating Institutions	
Matching Fund	Canadian Arthritis Network

Country	Austria
Core Institution	Institute of Molecular Pathology
Co-Chair (name and title)	Erwin Wagner, Deputy Director
Number of Cooperating Institutions	0
Cooperating Institutions	
Matching Fund	Austrian Academy of Science

Result of Program Implementation

In the fiscal year of 2006, we have established further strong ties among the four countries, Japan, USA, Canada and Austria. Between Tokyo Medical and Dental University and Harvard Medical School, Massachusetts General Hospital, the research subject was to investigate the merging of signalings of parathyroid hormone (PTH) and mechanical stress. Parathyroid hormone signaling has been known to be the most important anabolic measures in human and animals. However, the exact signaling mechanisms have not yet been fully understood. We have established astonishing discovery about the action of PTH with respect to the interaction with signaling induced by mechanical unloading. Collaborative research between Tokyo Medical and Dental University and University of Toronto in Canada as well as Institute of Molecular Pathology in Austria has also been progressed and the outcomes are ready for the publication in several of such research. In terms of symposium, 2006 was another successful year for the exchange of cutting edge scientific results and for the reporting the exciting information from each advanced countries to the open public in Japan.

We have conducted a number of symposiums and seminars to carry out the function of the advanced bone and joint science program as a center for this JSPS program. Interaction of young investigators as well as senior investigators has also been set up. We have carried out a number of senior research forum and through these activities we have established the interaction among the researchers in the 4 countries at the levels of both seniors and young generations. Thus, the program has been implemented efficiently so that the purpose of this Core-to-Core program could be met.

Achievements in FY2006 (Self Review)

Regarding the progress in the collaborative research including PTH actions in unloaded condition (Tokyo Medical and Dental University and Harvard University), and AP-1 actions in bone cell regulation (Tokyo Medical and Dental University and Institute of Molecular Pathology, Austria) and molecular actions of extracellular matrix protein containing RGDS (Tokyo Medical and Dental University and University of Toronto), we evaluated that these activities have been very well achieved. This is reflected by the recent publications of our collaborative research in the Journal of Biological Chemistry 2007 and also several abstracts which have been presented in the high level bone biology meeting in the United States (American Society for Bone and Mineral Research 2006). Symposium activity has also been evaluated to be high standard since the attendance of the seminars is always well and the survey after the seminar indicated high satisfactory response from the audiences and attendees of the seminar held under the program of Advanced Bone and Joint Science.

Interactions among the researchers in Japan and the 3 advanced countries have been very widely established and during the period of 2006. There were a number of visiting and interaction of the different layers of the investigators including seniors and young generations. Overall, in all the 3 categories including collaborative research, symposiums and seminars, and the activities of the interactions between the investigators, we have progressed a great deal during the period of 2006.

Future Plan (Measures toward Achieving Research Objectives)

Based on the progress being established in the last 3 years starting from 2004 and continued in 2005 and 2006, we will further strengthen activities on Core-to-Core program as continuation of the research in the program of Advanced Bone and Joint Science. Four countries, Japan, the United States of America, Canada and Austria have been well coordinated in terms of the progress for the collaborate research in bone and joint science. The seminars have been successful and in the future we will also widen our scope for the collection and the understanding of the research topics in bone and joint diseases. Researcher interaction will be further proceeded based on our first 3 years experience that interaction has been deepen because many of the young investigators have been knowing each other and some of them have already transferred their positions from our institution to the one in the U.S. Two investigators have experienced visit in Harvard and it is also been considered that such interaction will be expanded in the period of 2007.

We have formally established a tie between the Canadian Arthritis Network which is a nation-wide organization to have international link with advanced countries including Japan, the United States and European countries. This is another progress as the purpose of this JSPS Core-to-Core program is to establish such tie between the official organizations in the advanced countries. Overall, in the future plan including 2007 and 2008, we will continue this strategic research network project as move extensive activities among the 4 advanced countries.