

re-entry project was allowed application for the re-examination of FY 2011 though not fully implemented, and 3 projects were neither given permission for application for re-entry in FY 2011 nor implemented.

METI is conducting development of “advanced innovation centers [literal translation]” (joint R&D facilities), which will be used to work on the development of applied technologies from research, product tests, and for other purposes, while cooperating with universities, research institutions, and corporations to construct structures. As of FY 2009, 19 centers have been adopted as centers to implement joint research on low-carbon society and medical and health care and progress is being made in their installation. Also, to include local views, METI conducted fund raising for implementation of the “Industry-Academia-Government Collaboration ‘Cross Link Base for Technology’ (joint R&D facilities) [literal translation]” to be appropriated in the FY 2010 supplementary budget.

(Reform of research funding systems across ministerial boundaries)

The Cabinet Office (CAO) reforms the public research funding systems by building a “National R&D Database” accumulating data to be utilized for macro analysis, which is necessary for formulating the S&T Basic Plan and research and deliberations concerned with resource allocation.

The research funding systems sponsored by government ministries and agencies and R&D programs conducted by research organizations in the industrial, academic and governmental sectors cover various stages of development, from basic research to commercialization, and it is necessary to establish a mechanism that advances development persistently across various programs and organizations right up to the final stage of commercialization. In FY 2010, collaboration cases with projects of other ministries were created across ministries and agencies for the Okinawa Innovation Creation Project [literal translation] of the Cabinet Office. In addition, JST and the New Energy and Industrial Technology Development Organization (NEDO) held a “JST-NEDO Technical Information Exchange Program [literal translation]” to provide information to each other in relation to research outcomes of common interest under the aim of creating more seamless research results.

(3) Establishment of a sustainable and advanced industry-academia-government collaboration system

As the 21st century is often referred to as the “century of knowledge,” the creation and utilization of that knowledge is indispensable to the future development of Japan, and industrial-academia-government collaboration is an important means through which the country can generate a constant stream of innovation. Although industry-academia-government collaboration in Japan has recently made significant progress, the level of collaboration falls short when compared to the world-class research potential of Japanese universities. Therefore, it is necessary to promote industry-academia-government collaboration further, and for our country to increase its efforts in this area.

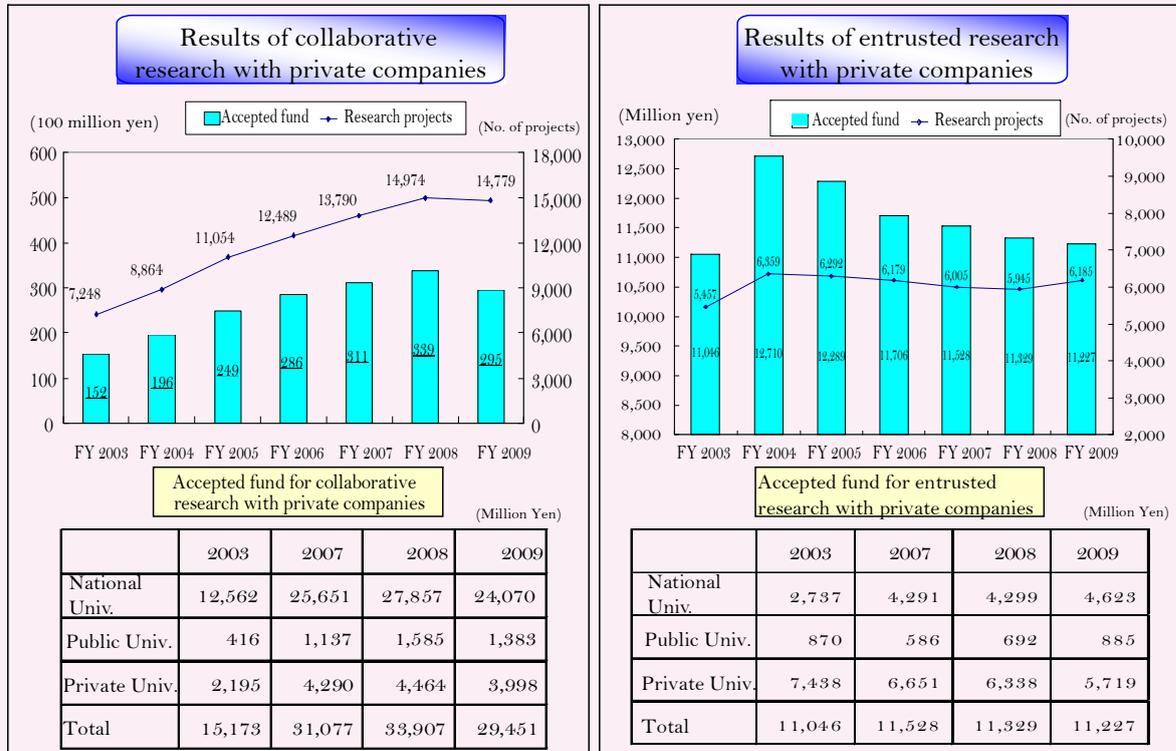
(Enhancement into real industry-academia-government collaboration)

Since the corporatization of national universities in April 2004, the industry-academia-government collaboration activities at universities and the like has shown steady results in general. In FY 2009, partly due to the global economic recession after the collapse of Lehman Brothers, the number of joint research projects between universities and the private sector was 14,779 (a decrease of one percent from the



previous year), and the amount of “accepted collaborative research funding” was about 29.5 billion yen (a decrease of 13 percent from the previous year). However, the amount of “accepted research funding” was 1.9 times greater than the amount in FY 2003 (Figure 2-3-5). In addition, the number of patented cases in FY 2009 increased to 5,489, about 29.7 times that of FY 2003.

● Figure 2-3-5/Trends in the Numbers of Joint Research, Accepted Prices



As of August 6, 2010

*Inquiry into national universities, public universities, private universities, etc.

*Universities include junior colleges, national colleges of technology, and Inter-University Research Institute Corporation

*“Total” and sum of sub-totals may not match due to rounding off.

*Patented applications includes consented patents, transferred patents, and patents at a stage of agreement.

Source : MEXT “FY 2009 Regarding Operational Situation of Industry-Academia Collaboration”

MEXT is implementing the “Program for Promoting Self-Sustaining Management of Industry-Academia-Government Collaboration in Universities,” to offer necessary support for developing an environment where universities can autonomously carry out industry-academia-government collaboration, while strengthening international or distinctive activities for industry-academia-government collaboration and appointing coordinators for the collaboration, so that universities, etc. can effectively contribute research results to society (Figure 2-3-6) (Figure 2-3-7)

From these efforts, results to contribute to solving problems in different fields such as environment and energy, health and longevity have been created. (Figure 2-3-8)

Figure 2-3-6/ Organizations Supported by Program for Promoting Self-Sustaining Management of Industry-Academia-Government Collaboration in Universities “Function Support Type” (April, 2010)

Implemented 59 cases/67 organizations

International (INTL) 16 cases/17 organizations
 Distinctive (DIST) 22/30
 Infrastructure (IF) 17/19
 Bio-venture (BV) 2/2
 Intellectual Property (IP) 2/3

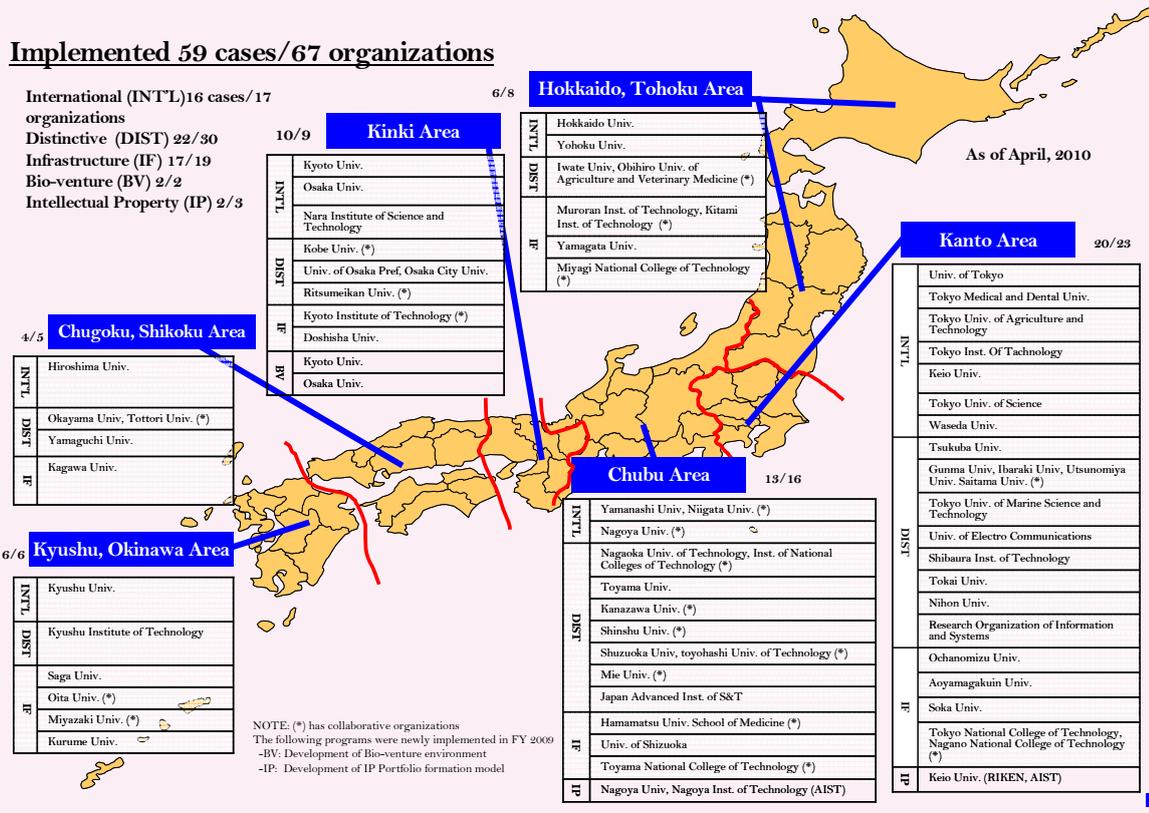
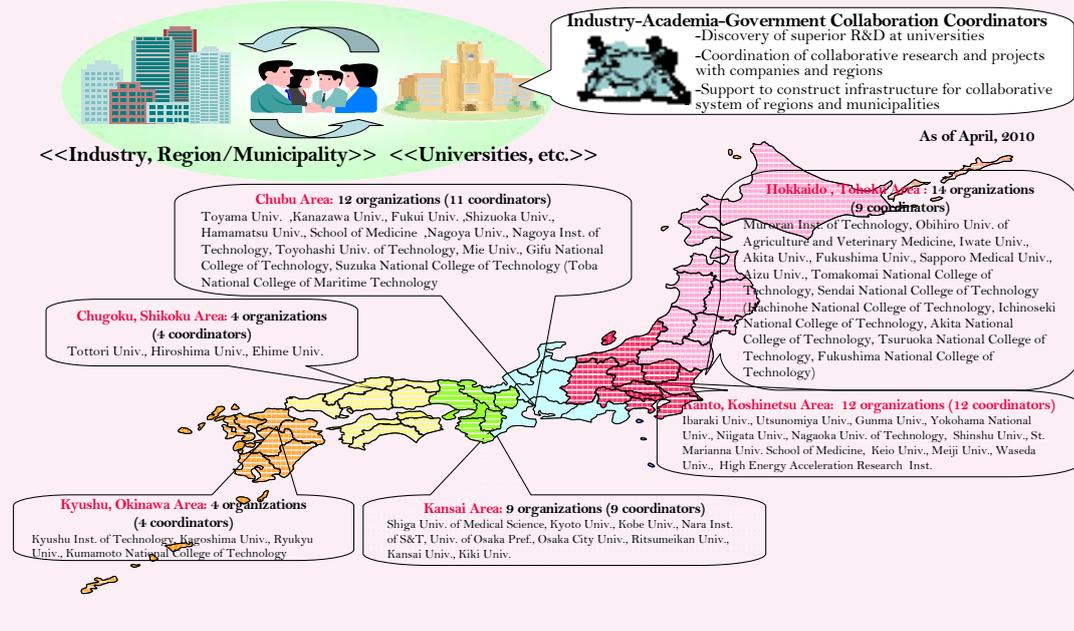


Figure 2-3-7/ Organizations Supported by Program for Promoting Self-Sustaining Management of Industry-Academia-Government Collaboration in Universities “Coordinator Support Type” (April, 2010)

Developing an environment where universities can independently implement industry-academia-government collaborative activities, while supporting the activities by coordinators for industry-academia-government collaboration, to contribute to the construction and enhancement of necessary infrastructure for universities to independently engage in the collaborative activities.





● Figure 2-3-8/Outcomes of Industry-Academia-Government Collaboration Measures Implementation

Tokyo Institute of Technology
 “International Collaborative Research on Solar Thermal Power Generation Technology”



Tower Type Solar Thermal Power Generation Technology Operation Test Plant (Abu Dhabi, UAE)

Tokyo Inst. of Technology, in collaboration with Abu Dhabi Future Energy Company and Cosmo Oil Co., implemented a test to evaluate and measure sunlight concentration under the beam-down system. By this test, realization of a large-scale solar thermal power generation became feasible and it is expected to apply this system in the Sun-belt areas such as Middle East, Africa, and Australia.

Source: Provided by Tokyo Inst. of Technology

Shinshu University
 “Development of “Virus/Pollen Proof Mask”



Virus/Pollen Proof Mask

Based on Shinshu University’ research result of Oxidase effect by phthalocyanines, Daiwabo Co. produced a high function mask, “AllerCatcher.” The mask can protect users from multiple hazardous substances such as viruses, pollen, and formaldehyde.

Source: Provided by Shinshu Univ.

Osaka University
 “Clinical application of Metabolite Marker with personalized medicine”

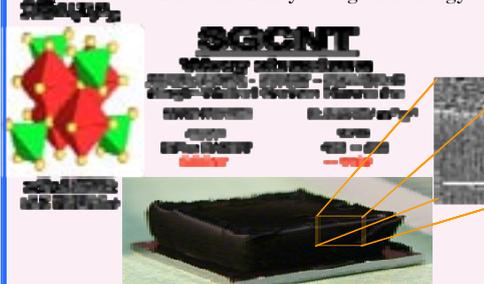


Fourier Transform Ion Cyclotron Resonance Mass Spectrometer

Osaka University, in collaboration with a Canadian bio-venture, Phenomena Discovery, developed a serodiagnosis system which enables early diagnosis by a simple method, for a various disease and pathological conditions such as cancer, dementia and Parkinson’s. This system can exclude unnecessary examinations and, as a result, it can be expected to reduce medical costs by 5 billion yen, in theory of medical economics.

Source: Provided by Osaka University

Tokyo University of Agriculture and Technology
 The world’s highest level, “nano-hybrid capacitor”, expected to be a new electricity storage technology



Nano-Hybrid capacitor

Tokyo University of Agriculture and Technology and Nippon Chemi-Con jointly developed the world’s highest performance capacitor, “Nano-Hybrid Capacitor.” The capacitor has a precise control over nanocrystalline lithium titanate and is expected to open a new market in the fields of electric vehicles, railway vehicles, and solar/wind power generation facilities.

Source: Provided by Tokyo Univ. of Agriculture and Technology

With regard to the practical use of research findings of universities and research institutes, the Japan Science and Technology Agency (JST) has implemented the “Adaptable and Seamless Technology Transfer Program Through Target-driven R&D (A-STEP),” and the “Industry-Academia Innovation Acceleration Project.”

The National Institute of Information and Communications Technology (NICT) is administering joint efforts between industry, academia and government with cutting-edge R&D test bed networks (JGN2plus)¹, which have been established by and are under the operation of the NICT.

MAFF launched the “Regional Support Coalition of Academia-Industry Collaborative Activities [literal translation]” in FY 2010, setting up coordinators specializing in the fields of agriculture, forestry, and fisheries and food industries across the country, and has implemented support efforts including assistance

¹ Providing nationwide IP network, light wavelength network, and R&D environment for light testbed. Also, promoting R&D by developing network lines with the U.S. and Asian countries.

with research planning. In addition, it has been facilitating new organization matching through opportunities such as lectures, seminars, and exhibitions, in collaboration with regional private businesses, universities, public experimentation and research institutes, and regional agricultural research centers. Additionally, industry-academia-government collaborative R&D is being promoted by consignment project research and competitive fund dispensation.

METI announced the “Strategic Technology Roadmap 2010” in June, 2010, in an attempt to predict the progress and trends of our future society, along with people’s needs and required technologies. This Roadmap is utilized in R&D management and provided to a wide range of people in industry, academia, and government as a communication tool for those who are engaged in R&D planning and implementation.

At the National Institute of Advanced Industrial Science and Technology (AIST), the “Research and Innovation Promotion Headquarters” was newly established in order to deal with the functional enhancement of open innovation. Up until this point, work such as in industry, academia and government, intellectual property, international standards, creation of ventures and internationalization has been done independently. The establishment of the “Research and Innovation Promotion Headquarters” provided a system to carry out such work unitarily and with mutual relevancy and to appoint “innovation coordinators” at the headquarters and research sites. These coordinators are expected to promote the coordination of cooperation efforts as an interface with outside organizations such as companies and universities. Under this system, it is expected to quickly and accurately identify the diverse needs of industry and society for industrial technology, discover and develop promising technological “seeds,” plan, promote and support R&D projects, support SMEs and create new industries. Also, to further enrich and deepen collaboration with private companies, JST held the JST Open-lab Exhibitions, to provide managers, researchers and engineers of private companies with information on research association findings. In addition, JST aimed at strengthening different collaborations via a network of private companies with collaboration experience (AIST Innovation Partners).

(Sustainable development of industry-academia-government collaboration)

- Building relationships of trust among industry, academia, and government -

To promote the strengthening of collaboration among industry, academia, and government, it is essential to bring about a state of common recognition between industry and public research institutions, including universities. To this end, the government provides opportunities for dialogue between companies and universities, while research institutions, including universities, announce research results and disclose other information by holding conferences, issuing periodical publications like annual reports, contributing papers to academic journals, and disclosing patents.

In addition, the following efforts are being conducted to foster trust among industry, academia, and government sectors.

In June, 2010, eight government ministries including the Cabinet Office, two related institutions and eleven independent administrative agencies, sponsored the “Science and Technology Festa in Kyoto - FY 2010 Conference for the Promotion of Collaboration among Business, Academia, and Government-” to promote more cooperation between industry, academia and government organizations. In addition, people of merit received awards at the conference for noteworthy successes that contributed significantly to industry, academia and government collaboration. (Table 2-3-9)



● Table 2-3-9/ 8th Merit Award Winners for Industry-Academia-Government Collaboration

Award	Achievement	Award winner
Prime Minister's Award	Pioneered and commercialized "Ene-Farm"	Yuji Nagata, Technology Executive, Toshiba Fuel Cell Power Systems Corporation
Minister of State for Science, Technology and Innovation Policy Award	Development of technology to remove brain tumors completely	Yohsihiro Muragaki, Associate Professor, Faculty of Advanced Techno-Surgery, the Institute of Advanced Biomedical and Engineering, Tokyo Women's Medical University. Shigeru Watanabe, General Manager, MRI Systems Division, Hitachi Medical Corporation Kyojiro Nanbu, Assistant. Chief, Strategic Planning Section, Strategic Technologies Development Department, Research & Development Center, Toshiba Medical Systems Corporation
Minister of State for Science, Technology and Innovation Policy Award	Development of rapid 15 minute test that can diagnose pandemic influenza at medical facilities	Toru Akiyama, Director, Research Institute, National Center for Global Health and Medicine Kenji Narahara Corporate Officer, R&D Center, Mizuho Medy Co., Ltd.
Minister of Internal Affairs and Communications Award	Realization of "Network Haptic Interface"	Haruhisa Kawasaki, Professor, Department of Human and Information Systems, Faculty of Engineering, Gifu University Yasuhiko Ishigure, Manager, Department of R&D, Marutomi Seiko Co., Ltd. Masato Matsumura, Director, e-Valley Co., Ltd.
Minister of Internal Affairs and Communications Award	Development of remote ophthalmological system	Kentaro Go, Associate Professor, Life Environment Medical Engineering, Division of Medicine and Engineering Science, Department of Research, Interdisciplinary Graduate School of Medicine and Engineering, Yamanashi University Kenji Kashiwagi, Associate Professor, Clinical Medical Science (Regional Medicine), Division of Medicine, Department of Research, Interdisciplinary Graduate School of Medicine and Engineering, Yamanashi University
Minister of MEXT Award	Development of "Super Hybrid Materials"	Tadafumi Ajiri, Professor, World Premier International Research Center, Advanced Institute for Materials Research, Tohoku University Kazuyoshi Ichikawa, Project General Manager, Japan Chemical Innovation and Inspection Institute Yukihiko Yamauchi, Deputy Director of The Research Institute of Instrumentation Frontier, National Institute of Advanced Industrial Science and Technology
Minister of MEXT Award	Development of Casting CAE System "ADSTEFAN"	Koichi Anzai, Professor, Tohoku University Graduate School of Engineering Isamu Takahashi, Senior Researcher, Hitachi Research Laboratory, Hitachi, Ltd. Masatoshi Tanimoto, Deputy Director, ADSTEFAN Center, Ibaraki Hitachi Information Service Co. Ltd.
Minister of MEXT Award	Development of "AllerCatcher Product Aggregate"	Hirofuki Shirai Professor emeritus, Shinshu University, Baiwabo Co. Shinshu TLO Co.
Minister of Health, Labour and Welfare Award	Development of "New Digital Mammography Method"	Tokiko Endo, Director of Department of Advanced Diagnosis, Clinical Research Center and Director of Department of Radiology, National Hospital Organization, Nagoya Medical Center Tomonari Sendai, Senior Researcher, Development Center of Medical Systems, Fujifilm Co.
Minister of Agriculture, Forestry and Fisheries Award	Development and commercialization of "Plant Viral Disease Vaccine"	Yoshitaka Kosaka, Director, Biotechnology Research Department, Kyoto Prefectural Agriculture, Forestry and Fisheries Technology Center Tomohide Natsuaki, Prof. Faculty of Agriculture, Utsunomiya Univ. Kyoto Biken Laboratories, Inc

Minister of Economy, Trade and Industry Award	Development of “Next Generation Hard-Disk (Patterned Media) Electron Beam Mastering System”	Seigo Honme, Chairman of the Board, CEO, ELIONIX INC. Isao Nakatani, Fellowship Researcher, National Institute for Materials Science Hidenori Shinno, Professor, Precision and Intelligence Laboratory, Tokyo Institute of Technology
Minister of Economy, Trade and Industry Award	HoPE – an industry-academia-government collaboration system in which small- and medium-sized enterprises take center stage and yield steady results	Tsunehisa Arais, Professor and Deputy Executive Director of Hokkaido University’s Center for Innovation and Business Promotion; Director of the Center’s Technology Licensing Organization (TLO) section; Chair of the HoPE Steering Committee Shuichi Kamoda, Director, former Hokkaido Industrial Research Institute’s Technology Support Center; former Chair of the HoPE Planning Committee Tamitsugu Watanabe, President, Sankou Kagaku, Inc.; Representative Manager of HoPE
Minister of Land, Infrastructure, Transport and Tourism Award	Development of “Warning Sheet for Falling Asleep at the Wheel”	Shigehiko Kaneko, Professor, The University of Tokyo, Chairman, “Prediction of Sleep Research Group”(*) [literal translation] (*) The group is made up of The University of Tokyo, Oita University, Shimane Institute of Health Science and Delta Tooling Co.
Minister of Land, Infrastructure, Transport and Tourism Award	Advanced Construction Technology for “Twin Arch Concrete Bridge with Steel Strut”	Junichiro Niwa, Professor, Tokyo Institute of Technology Hitoshi Yamada, Professor, Yokohama National University Yuhei Takatoku, Construction Chief, Obayashi Corp./PS Mitsubishi Construction Co. Joint Venture
Minister of Land, Infrastructure, Transport and Tourism Award	Development of a highly efficient ground-source heat pump system using less water	Yasushi Nakamura, Senior Manager, Nippon Steel Engineering Co. Katsunori Nagano, Professor, Graduate School of Engineering, Hokkaido University Takao Katsura, Lecturer, Faculty of Environmental Engineering, the University of Kitakyushu
Chairman of Nippon Keidanren Award	Development of ultra long-life insulating material which enables compatibility of electric insulation and softness	Kazuhiko Sato, Principal Research Scientist, Research Institute for Innovation in Sustainable Chemistry, National Institute of Advanced Industrial Science and Technology Hiromichi Shimada, Deputy General Manager, Tsukuba Center, National Institute of Advanced Industrial Science and Technology Hiroshi Uchida, Corporate Fellow, Showa Denko K.K.
President of Science Council of Japan Award	Development of a new safety bio-marker utilizing large-scale toxicogenomics database	Yasuo Ohno, Deputy Director General, National Institute of Health Sciences, Toxicogenomics/Informatics Project (TGP2) Leader Tetsuro Urushitani, National Institute of Biomedical Innovation, Dean of Pharmaceutical Department, Doshisha Women’s College of Liberal Arts, Professor of Pathophysiology 13 companies participated in TGP2

Furthermore, MEXT and METI, in cooperation with JST and NEDO, held the “Innovation Japan 2010: University Fair,” a nationwide industry-academia matching event to disseminate research results of universities and public research institutions concerning state-of-the-art industrial technologies, etc.

MAFF, in conjunction with related governmental ministries and organizations, held “agricultural business creation fairs,” to exhibit the technological seeds of private businesses, universities, public experimental research institutions and independent administrative institutions engaged in research of agriculture and the food industry, and to facilitate cooperation among institutions with relevant technological needs.

- Promotion of voluntary initiatives by universities, etc. -

In order to enhance the system for the creation, protection, and utilization of strategic, intellectual property at universities (actively supporting the acquisition of basic patent rights internationally, development of intellectual property activity system through cooperation between universities, and other activities), MEXT established the “Program for Promoting Self-Sustaining Management of



Industry-Academia-Government Collaboration in Universities, etc.”

From such projects, guidelines and rules that cover entire universities are being developed to promote systematically organized industry-academia-government activities, including an industry-academia collaboration policy, a policy on conflict of interest, regulations on joint research, etc.

- Revitalization and enhancement of collaboration between University Intellectual Property Headquarters and technology licensing organizations (TLOs) -

Based on the “Act on the Promotion of Technology Transfer from Universities to Private Business Operators” (Act No. 52 of 1998), 46 TLOs were authorized as of March 1, 2011. The number of patents licensed was 2,707 as of March 2010.

In recent years, national university corporations have exerted efforts for university-TLO cooperation enhancement such as the establishment of TLOs inside corporations, the change of external TLOs into internal ones, and the funding to authorize TLOs.

- Smooth implementation of intellectual property-related activities -

JST offers a series of comprehensive programs covering the identification of exceptional research results, support for patenting, etc. JST is comprehensively implementing “Technology Transfer Support Center” projects that support technology transfer-related activities. Such projects include: the support of strategic international patenting of research results obtained at universities, the rendering of development services and licensing of research results including patents, the fostering of the human resources who should play a fundamental part in these activities, and the provision of a research environment where patents do not restrict any research by permitting use of universities’ patents, etc. without charge for the propose of conducting basic research.

(4) Promotion of foundation of R&D-oriented ventures

Thanks to efforts by the industrial, academic and government sectors with regard to university-based venture companies, more than 1,900¹ venture companies originated with universities have so far been established nationwide. JST implemented the project, “Adaptable and Seamless Technology transfer Program through target-driven R&D (A-STEP)” as part of its effort to support research related to the creation of university-based start-ups, with 110 new start-ups established as of the end of January 2011.

RIKEN established a system to promote rapid dissemination and practical use of research results through preferential treatment in joint research intended for venture businesses, which are established by researchers based on their own research results.

The National Agriculture and Food Research Organization (NARO) set a framework for training venture businesses in the “Basic Research Promotion Program for Creation of Innovation,” providing assistance for R&D conducted by R&D venture companies that would provide important roles in new businesses or lead to the creation of new industries.

¹ Examined by National Institute of Science and Technology



(5) Promotion of R&D by private companies

R&D activities provide sources of sustainable socio-economic growth and stronger international competitiveness via the creation of new “knowledge” and new industries and markets through innovation. Particularly, R&D activities in the private sector make up more than 70% of all R&D activity in Japan. Thus, further encouragement of revitalization will lead to reinforcement of the foundation necessary to create innovation. The government, while respecting the principle of voluntary efforts being taken by private companies, stimulates motivation by utilizing a tax system that facilitates R&D and by enhancing technology development support programs that reduce the risks involved in the R&D process up to and including the stage of commercialization.

(Promotion of private-sector R&D activities through tax support)

To promote research activities by the private sector, various preferential tax measures are provided as shown in the table below. According to the FY 2010 tax system revision, two types of tax credits are available to chose from: either in relation to increases in experimentation and research expenses (an Expense Increase type), or for research expenses exceeding 10% of total average sales (a High Expense type) and the applicable period was extended by two years (through 2011). (Table 2-3-10)