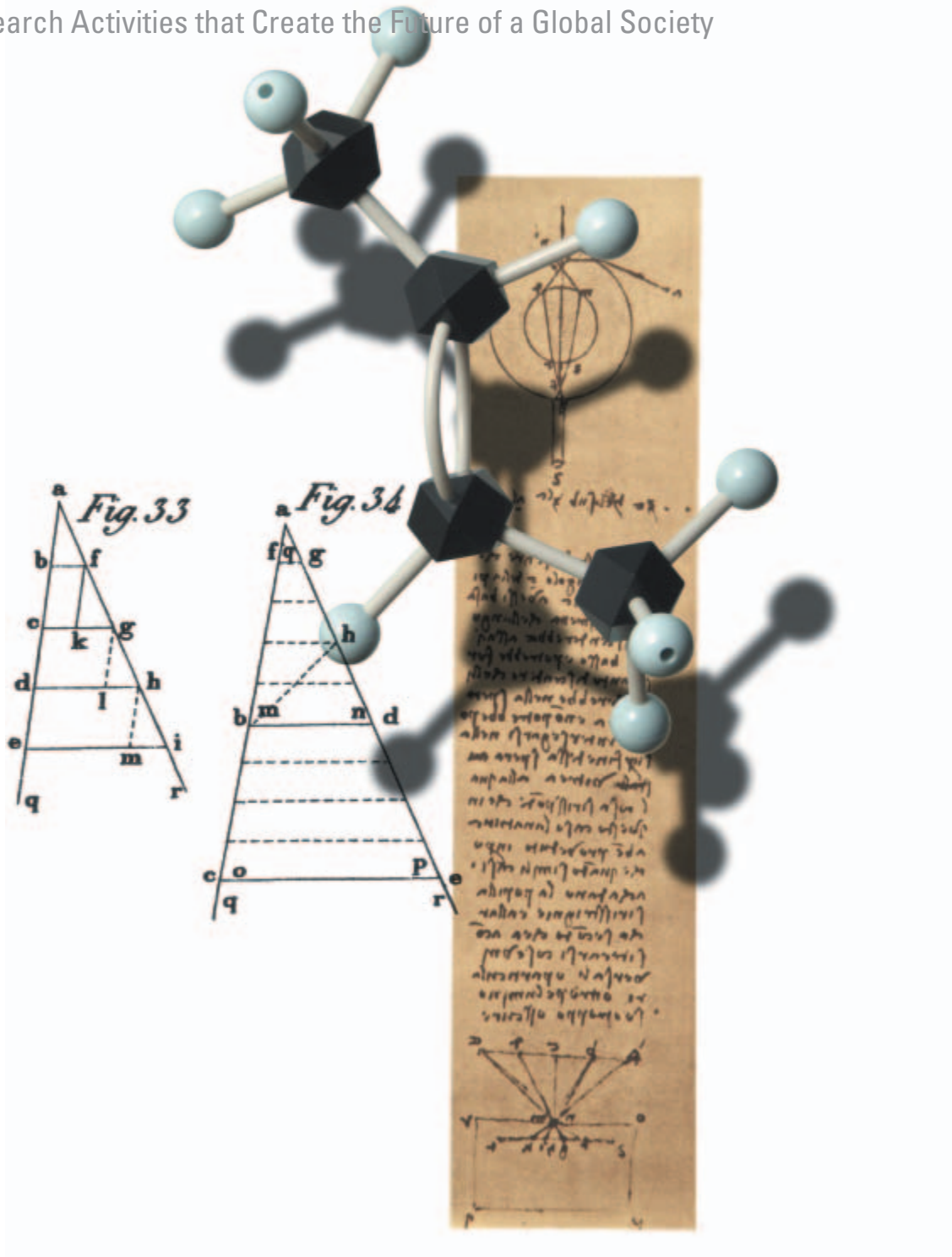


Keio University

Annual Report on Research Activities

2006–2007

From Collaborations to Innovations:
Research Activities that Create the Future of a Global Society



Keio University



Keio University, which will celebrate the 150th anniversary of its founding in 2008, has produced graduates who have contributed not only to Japanese society but to international society as well, based on the ideals of Yukichi Fukuzawa; namely, that the university should be a "leader of society as a whole." Looking back through the history of the world, even since the founding of the first universities in Bologna and Paris in the 12th century, the mission of universities has been the creation and accumulation of knowledge. This mission has traditionally involved maintaining a distance from short-term social trends and social demands; universities have thus played an important role in terms of making dramatic leaps into a future that differs fundamentally from the character of society at any given time.

In our modern era, which is facing unpredictable and complex changes both domestically and internationally, universities are expected to play a greater role than ever before, as a leader in a wide range of fields including education, research, medicine, and social contributions, or as a central core for society as a whole. In terms of research activities, there is an increasing demand for universities to make direct contributions to society; not only through traditional academic research, but also through intellectual property activities, industry-academia-government collaborations, and medicine. Based on this awareness, at Keio University, we will create a vision embodying a dynamic balance (a university with an elliptical structure) with a dual focus: on maintaining a distance from short-term social trends (independence) on the one hand, and active involvement with real-world society (collaboration) on the other. We will thus undertake research activities in a wide range of fields, with the goal of creating "intellectual value" and opening up new fields in the real world of industry.

Communicating the university's research activities and research results to the public is important policy from a social perspective, in terms of creating a university that is open to the world, and a university that opens up new possibilities for the future. In this 5th "Annual Report on Research Activities," our goal is to help readers to gain an understanding of the current status of research activities and current trends, while at the same time providing statistical data and introducing the latest topics, in order to communicate a comprehensive picture of research activities at Keio University.

Keio University has entered an era of new challenges as one of the world's leading universities. We hope that this Report will give you some idea of the future potential embodied in the University's research activities.

Yuichiro Anzai
President
Keio University

Keio University



c o n t e n t s

Keio University Annual Report on Research Activities

2006-2007

- 03 **Organization for Research Advancement and Administration (ORAA)**
- 04 **Guide to Research Activities at Keio University**
- 05 **Research Centers**
 - 05 Mita Campus / Hiyoshi Campus
 - 09 Yagami Campus
 - 11 Shinanomachi Campus
 - 13 Shonan Fujisawa Campus (SFC)
 - 15 Shin-Kawasaki Town Campus
 - 17 Tsuruoka Town Campus
 - 19 Research Institute for Digital Media and Content (DMC)
- 21 **Promoting Research Collaboration and Transmission to Society**
—Activities at the Center for Research Promotion—
- 23 **Internationalization of Research Activities at Keio University**
- 24 **The 21st Century COE Program / Global COE Program**
- 25 **Toward an Integrated Methodology for the Study of the Mind**
—CIRM: Centre for Integrated Research on the Mind—

Development of a Theory of Market Quality and an Empirical Analysis Using Panel Data
- 26 **Designing toward the Ordering of Political Society in a Multi-cultural and Pluri-generational World**

Policy Innovation Initiative: Human Security Research in Japan and Asia
- 27 **Understanding and Control of Life's Functions *via* Systems Biology**

Function Creation Oriented Life-Conjugated Chemistry
- 28 **Optical and Electronic Device Technology for Access Network**

Next Generation Media and Intelligent Social Infrastructure
- 29 **Establishment of Individualized Cancer Therapy Based on Comprehensive Development of Minimally Invasive and Innovative Therapeutic Methods**

Basic Study and Clinical Application of the Human Stem Cell Biology and Immunology: Approaches Based on the Development of Experimental Animal Models
- 30 **Integrative Mathematical Sciences: Progress in Mathematics Motivated by Natural and Social Phenomena**

System Design: Paradigm Shift from Intelligence to Life
- 31 **FY2006 Financial Position**
- 32 **Research-related Facilities and Libraries**
- 33 **Research Funds at Keio University in FY2006**
- 37 **Competitive Research Funds**
- 39 **Researchers at Keio University in FY2006**
- 41 **Technology Transfer: Activities at the Intellectual Property Center**
- 43 **Awards for Research Activities, FY2006**
- 44 **Index**
- 45 **Access Information**

Organization for Research Advancement and Administration (ORAA)

Advancement of Research at Keio University

Keio University believes that its mission of returning the fruits of research to society is equally as important as that of research and education. Based on the principle of "*Gakujitsu Sento* (leadership for scientific progress), the University aims to make significant contributions to international society in the 21st century through original and creative academic research. At five campuses — Mita, Hiyoshi, Yagami, Shinanomachi, and Shonan Fujisawa — Keio University is currently conducting numerous advanced research projects, including 12 that have been designated as "21st Century Centers of Excellence (COEs)" designated by the Ministry of Education, Culture, Sports, Science and Technology (MEXT). Traditionally, Keio University has been deeply involved in activities by collaborations among industry, government, and academia. Such research activities, in the form of research commissioned from outside parties, joint research, and personnel exchanges, are mainly undertaken at five research facilities: The Keio Leading-edge Laboratory of Science and Technology (KLL) at the Yagami Campus; the Center for Integrated Medical Research at the Shinanomachi Campus; the Keio Research Institute at SFC (Shonan Fujisawa Campus), the Shin-Kawasaki Frontier Research and

Education Collaborative Square (K-FRECS) in Kawasaki City, and the Institute for Advanced Biosciences in Tsuruoka City.

Keio established the Organization for Research Advancement and Administration (ORAA) in October 2003 to further facilitate the full range of research activities undertaken at these facilities, by providing support to researchers, creating and promoting comprehensive, interdisciplinary research throughout Keio University, and returning the fruits of this research to society.

Roles and Functions of the ORAA

The ORAA is comprised of various Centers and Committees, including: the Center for Research Promotion (CRP), the Incubation Center, the Intellectual Property Center (IPC), Keio Advanced Research Centers (KARC), the Intellectual Property Mediation Committee, and the Research Ethics Committee. It supports all aspects of research-related activities, from the start of strategic research to the transmission of results to society. The major roles and functions of each organization in the ORAA are as follows.

Offices of Research Administration

Support research activities at all campuses

The Offices of Research Administration, which support research while maintaining close contact with individual researchers, are located at the five campuses in Mita, Hiyoshi, Yagami, Shinanomachi, and Shonan Fujisawa. In addition to functioning as the contact point on each campus for outside organizations, these Offices provide support for research in collaboration with the Organization for Research Advancement and Administration (ORAA).

Specifically, the Offices provide information to researchers in areas such as research resources, research environments, and opportunities for research subsidies from inside and outside Keio University (public calls for subsidy applications), and also offers a variety of other support services including negotiations and completion of contracts for joint or commissioned research, management of research expenses and research spaces, and compilation and presentation of research results.

Intellectual Property Center (IPC)

The Technology Licensing Organization (TLO) for Keio University

As Keio University's Technology Licensing Organization (TLO), the Intellectual Property Center has a wide a range of responsibilities, including management and operation of intellectual property generated by the University to promoting collaborations with society based on that intellectual property. Based on applications for inventions submitted by researchers, the IPC closely examines patentability and the potential for licensing, taking into consideration the researchers' concepts of practical applications. It then makes selections, files patent applications, and maintains and controls those successful patents. These technology licensing operations open the door to a wide range of other activities, including licensing of Keio University's patented technologies to companies, the creation of new companies with foundations in intellectual property rights, and joint research with companies aimed at developing products for practical applications.

Intellectual Property Mediation Committee

When an inventor lodges an objection regarding a given patent application, the Intellectual Property Mediation Committee acts as a mediator based on the Keio University Regulations for the Handling of Inventions.

Research Ethics Committee

The Research Ethics Committee coordinates and manages policies and regulations related to issues such as research ethics and conflicts of interest. Its main goal is to create structures that are capable of promoting fairness and safety in research activities in response to demands from society, particularly with regard to compliance problems in relation to recent university research activities, and the conflicts of interest that can arise in activities involving collaborations among industry, government, and academia.

Center for Keio Frontier Research and Education Collaborative Square (K-FRECS)

While the University's main campuses maintain the traditional functions of research and education, The Frontier Research and Education Collaborative Square (K-FRECS) functions as a base for cutting-edge, collaborative research based on cooperation with the community, as well as essential research that cuts across various University faculties and departments.

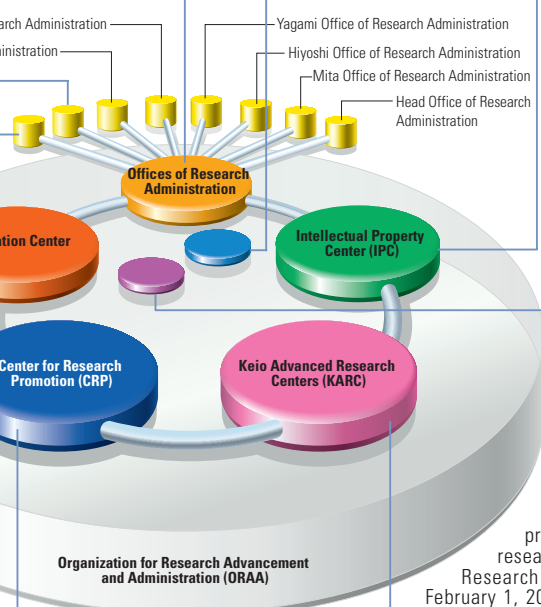
Center for Integrated Education System

The Center for Integrated Education provides front-line support in the primary and secondary education facilities affiliated with Keio University.

Incubation Center

Supports incubation activities throughout Keio University

The goal of the Incubation Center is to support and promote "incubation activities" aimed at transferring the results of research at Keio University to other areas of society. In March 2007, the "Keio Fujisawa Innovation Village," a core facility of the "Keio University Collaborative Entrepreneur Development Program," celebrated its first anniversary. The Village establishes new companies through its incubation manager and provides related support in financial affairs, accounting and intellectual property. The Village also calls on outside experts to provide venture business consultations, introduces university researchers to industry partners, and supports the acquisition of grants. To spread these activities university-wide, "KEIO INCU-NET" was launched in February 2007 as a venture support and planning network. Members include incubation experts from both within and outside Keio.



Keio Advanced Research Centers (KARC)

Supports the creation of advanced, interdisciplinary research

In recent years, Keio University has felt an increasing need to create a new research model based on cooperation between diverse fields. To promote an interdisciplinary approach to research collaboration, the Keio Advanced Research Centers (KARC) was established on February 1, 2007. KARC has an active and flexible modus operandi towards the establishment, revision, and management of research centers. The aim is to stimulate research activities in diverse fields while improving efficiency and speed.

Center for Research Promotion (CRP)

The general contact point for collaborations among industry, government, and academia

The Center for Research Promotion (CRP) promotes interdisciplinary research activities as a general producer of industry-government-academia collaboration. In particular, the CRP 1) proposes joint research projects that match university resources with industry needs, 2) supports the application process to acquire public research funds for joint projects between industry and academia and helps coordinate the launch of projects, 3) encourages interdisciplinary collaboration, including joint research with industry, and manages internal research fund programs that aim to acquire external funding, and 4) communicates research achievements through symposiums and promotes personnel exchanges. These activities are developed in coordination with an advisory board composed of board members, one from each campus.

Guide to Research Activities at Keio University

"I'd like to know about the current status of compliance activities in relation to research activities, and about the rules for issues such as conflicts of interest and research ethics in relation to industry-academia collaborations."	→	Organization for Research Advancement and Administration (ORAA) http://www.oraa.keio.ac.jp/index-e.html E-mail: oraa-jimukyoku@adst.keio.ac.jp
"I'm thinking about doing joint research with Keio University. Who should I contact first?" "I'd like to obtain a copy of the 'Keio University Annual Report on Research Activities'. "Could you send me information on research-related events by e-mail?"	→	Center for Research Promotion http://www.crp.keio.ac.jp/en/index.html E-mail: crp@info.keio.ac.jp
"I'd like to learn more about the intellectual property owned by Keio University." "I need some advice regarding licensing of patented technologies." "I'd like to participate in some of the events and activities held by the Intellectual Property Center, such as the Keio Technology Licensing Forum, the Venture Private Conference, or the Keio Innovation Network."	→	Intellectual Property Center http://www.ipc.keio.ac.jp/english/index.html E-mail: toiawasesaki-ipc@adst.keio.ac.jp
"I'd like to know about research activities at the Keio Advanced Research Centers."	→	Keio Advanced Research Centers (KARC) http://www.karc.keio.ac.jp/index-e.html E-mail: karc-jimu@adst.keio.ac.jp
"I'd like to invest in the _____ Venture originating from Keio University." "I'd like to get into the Incubation Facilities."	→	Incubation Center E-mail: incu-jimu@adst.keio.ac.jp
"I'm interested in the technologies developed by Prof. _____, in the Graduate School of Science and Technology. Would it be possible to get some advice?" "How can I register to receive the KLL mail magazine?" "I'd like to participate in the KEIO TECHNO-MALL."	→	Keio Leading-edge Laboratory of Science and Technology (KLL) Liaison Office http://www.kll.keio.ac.jp/liaison/index.html E-mail: liaison@educ.cc.keio.ac.jp
"I want to search for Keio University research information on the homepage."	→	Keio Researchers Information System (K-RIS) http://www.k-ris.keio.ac.jp/index_en.html
"I'd like to get some detailed information on research activities at the Keio Research Institute at SFC (Shonan Fujisawa Campus), and on events like the Open Research Forum (ORF)."	→	Keio Research Institute at SFC http://www.kri.sfc.keio.ac.jp/en/index.html
"I'm interested in a Research Project at the Shin-Kawasaki Town Campus." "I'd like to participate in a seminar being held at the Shin-Kawasaki Town Campus."	→	Shin-Kawasaki Town Campus http://www.k2.keio.ac.jp/
"I'd like to find out about research and educational activities being conducted at the Institute for Advanced Biosciences on the Tsuruoka Town Campus."	→	Tsuruoka Town Campus http://www.iab.keio.ac.jp/en/

Events

FY2006 (April-March)

DD/MM/YY	Event	Host	Site
24/05/06	The 10th Keio Innovation Network	IPC	Mita
6-7/06/06	Venture Private Conference	IPC	Mita
07/06/06	Intellectual Property Center Symposium "The Future of Venture-Created Japan"	IPC	Mita
27/06/06	The 11th Keio Innovation Network	IPC	Mita
22/07/06	Keio University Center for Research Promotion Symposium "Designing the Future with Sports: The Research and Promotion of Sports Medicine/Sciences and Culture"	CRP	Mita
26/07/06	The 12th Keio Innovation Network	IPC	Mita
30/07/06	"Brilliant and Exciting Science: Welcome to the University Lab"-KAKEANI# Returning and Diffusing the Achievements of Research	Head Office of Research Administration	Mita
3-5/08/06	Keio Summer Bio Camp 2006	Faculty of Environmental Information and Institute for Advanced Biosciences	Tsuruoka Town
21-23/08/06	Summer Bio College 2006	Faculty of Environmental Information and Institute for Advanced Biosciences	Tsuruoka Town
26/08/06	IAB Open Campus 2006	Institute for Advanced Biosciences	Tsuruoka Town
27/09/06	13th Keio Innovation Network	IPC	Mita
1-2/11/06	11th Keio Medical Science Prize Ceremony and Commemorative Symposium	Keio University Medical Science Fund	Shinanomachi
06/11/06	The 14th Keio Innovation Network	IPC	Mita
10-11/11/06	The 1st Metabolome Symposium "The Future of Life Sciences through Metabolomics"	Institute for Advanced Biosciences	Tsuruoka Town
15/11/06	21st Century COE Program International Symposium: "Establishing individualized cancer treatments through the development of new and low-invasive treatments"	Office of Research Administration	Shinanomachi
18/11/06	Open Campus 2006 - Introducing Research Projects at K'	Shin-Kawasaki Keio Frontier Research & Education Collaborative Square	Shin-Kawasaki Town
18/11/06	K' Open Seminar	Shin-Kawasaki Keio Frontier Research & Education Collaborative Square	Shin-Kawasaki Town
22-23/11/06	SFC Open Research Forum 2006	Keio Research Institute at SFC	Marunouchi Building, other venues
30/11/06	The 15th Keio Innovation Network	IPC	Mita
01/12/06	The 7th Keio Science and Technology Exhibition KEIO TECHNO-MALL 2006	Yagami Campus Office of Research Administration and KLL	Tokyo International Forum
14/12/06	1st Seminar on the development of manpower that will be responsible for international industry-academia collaborations (research collaborations, technology transfers)	IPC	Mita
12/15,16,18/06	Hiyoshi Research Portfolio2006 Exhibition	HRP Steering Committee	Hiyoshi
21-22/12/06	Venture Private Conference	IPC	Mita
17-18/1/07	Ministry of Education, Culture, Sports, Science, and Technology Leading Project for Biosimulation - International Symposium Event	Shinanomachi Campus Office of Research Administration	Mita

DD/MM/YY	Event	Host	Site
20/01/07	K' Open Seminar	Shin-Kawasaki Keio Frontier Research & Education Collaborative Square	Shin-Kawasaki Town
24/01/07	2nd Seminar on the development of manpower that will be responsible for international industry-academia collaborations (research collaborations, technology transfers)	IPC	Mita
30/01-01/02/07	3rd Seminar on the development of manpower that will be responsible for international industry-academia collaborations (research collaborations, technology transfers)	IPC	Mita
20/02/07	Keio Symposium for Leading-Edge Science and Technology "Aiming for rapid medical applications of basic research in life sciences"	CRP	Mita
28/02/07	4th Seminar on the development of manpower that will be responsible for international industry-academia collaborations (research collaborations, technology transfers)	IPC	Mita
20/03/07	Intellectual Property Center Symposium: "Changes in the World of Patents: The Arrival of New Business"	IPC	Mita
21-23/03/07	Spring Science Camp 2007	Japan Science and Technology Agency	Tsuruoka Town

FY2007 (April-March)

18/4/07	The 16th Keio Innovation Network	IPC	Mita
2-3/7/07	Venture Private Conference	IPC	Mita
20/07/07	Keio University/NTT Joint Symposium: "Ubiquitous Leadership" - The Future of Industry-Academia Collaborations	CRP	Mita
25/07/07	The 17th Keio Innovation Network	IPC	Mita
2-4/08/07	Keio Summer Bio Camp 2007	Faculty of Environmental Information and Institute for Advanced Biosciences	Tsuruoka Town
07/08/07	"Brilliant and Exciting Science"	Head Office of Research Administration Mita	Shin-Kawasaki Town
20-22/8/07	Summer Bio College 2007	Faculty of Environmental Information and Institute for Advanced Biosciences	Tsuruoka Town
27/10/07	21st Century COE Program International Symposium: "Establishing individualized cancer treatments through the development of new and low-invasive treatments"	Shinanomachi Office of Research Administration	Shinanomachi
22-23/11/07	SFC Open Research Forum 2007	Keio Research Institute at SFC	Roppongi Hills
29-30/11/07	21st Century COE Program International Symposium: "Basic Study and Clinical Application of the Human Stem Cell Biology and Immunology: Approaches based on the Development of Experimental Animal Models"	Shinanomachi Office of Research Administration	Shinanomachi
05/12/07	The 8th Keio Science and Technology Exhibition KEIO TECHNO-MALL 2007	Yagami Campus Office of Research Administration and KLL	Tokyo International Forum
2008 (mid-March)	Spring Science Camp 2008		Tsuruoka Town
TBD	Open Campus 2007 (introducing K' Research Projects)	Shin-Kawasaki Keio Frontier Research & Education Collaborative Square	Shin-Kawasaki Town
TBD	K' Open Seminar	Shin-Kawasaki Keio Frontier Research & Education Collaborative Square	Shin-Kawasaki Town

* Listed here are events implemented by the ORAA, or related events at the campus level. There are many other events scheduled and hosted by various research institutes. For details, see the website of each research institute.
* With the exception of venues outside the University, all sites indicate the names of campuses: E.g. "Mita": Mita Campus; "Tsuruoka Town": Tsuruoka Town Campus.



Research Centers

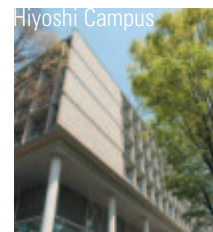
Mita Campus/ Hiyoshi Campus

Pathways to the Future for the Humanities, Social Sciences, and Natural Sciences: Centers for Comprehensive Research and Education

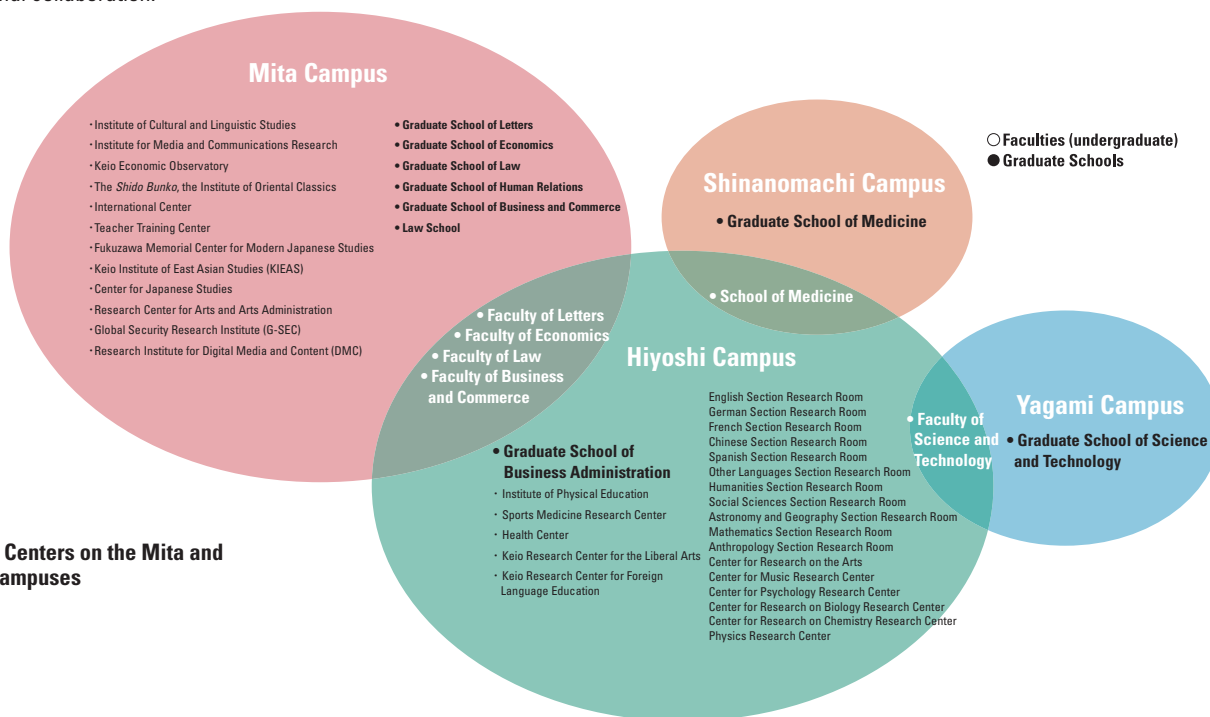
For Inquiries:

Mita Campus
2-15-45 Mita, Minato-ku, Tokyo, 108-8345 Japan
TEL: +81-3-3453-4511 (Main)

Hiyoshi Campus
4-1-1 Hiyoshi, Kohoku-ku, Yokohama-shi, Kanagawa, 223-8521 Japan
TEL: +81-45-563-1111 (Main)



The Mita Campus is home to undergraduate departments (primarily for third- and fourth-year students), graduate schools (six graduate schools), and independent research institutions. The Hiyoshi Campus houses undergraduate departments in the humanities, social sciences, and natural sciences (primary for first-year and second-year students), research institutes, and the Graduate School of Business Administration (including Keio Business School). The following is an introduction of research institutions located on these two campuses centering around recent activities, including international collaboration.



Research Centers on the Mita and Hiyoshi Campuses

Institute of Cultural and Linguistic Studies

The Institute of Cultural and Linguistic Studies is a research institution staffed with 7 full-time researchers. It carries out basic research on the various languages of the world, on the ideas and cultures of different regions and time periods, and on linguistics and linguistic theory. Its active research activities have attracted both domestic and international attention. The Institute is organized into project units. In FY2006, five projects were organized: the public research project "Writings of Intellectuals and Civilian Culture in Asia" (Principal Investigator (PI) : Eiji Yamamoto), "Concept of 'the Individual' in Western Ideas" (PI: Sumio Nakagawa), "Cognitive Science Group" (PI: Yukio Otsu), "Southeast Asian Languages Research Group" (PI: Naomitsu Mikami), and "Reception and Transformation of Philosophical Tradition in Middle Eastern Monotheistic Intellectual Culture" (PI: Shin Nomoto). In addition, ten individual research projects were established. Research achievements of the Institute are published in its bulletins and monographs. Members of the Institute are also primary participants in Keio University's 21st Century COE Program (Humanities) "Toward an Integrated Methodology for the Study of the Mind" and the Global COE Program "Centre for Advanced Research on Logic and Sensibility."



Scene from TCF2007

The Institute offers an abundance of activities for the general public. It invites prominent domestic and foreign linguistic theorists for its language colloquia, which are held four times a year. In 2006, public lectures based on the theme "Japanese Life and Identity" were held. The Institute is gaining attention from both academic and general audiences.

The Tokyo Conference on Psycholinguistics, held annually, is a high-level international conference. It steadily offers research achievements, and its proceedings are published in English. On the educational front, the Institute offers special lectures not organized by academic departments, including lectures on Asian and ancient Middle Eastern languages. In 2006, the institute offers 23 lectures on 11 languages.

In FY2006, the Institute published *Bulletin of Keio University Institute of Cultural and Linguistic Studies* No. 38 (March 2007).

<http://www.icl.keio.ac.jp/>

Institute for Media and Communications Research

The Institute for Media and Communications Research is participating in the 21st Century COE Program "Designing toward the Ordering of Political Society in a Multi-cultural and Pluri-generational World." For this, it forged an intimate partnership with the 21st Century COE-CCC for its research activities. In 2006, financed by its own research funds, special donations, and promotional funds, the Institute carried out five research projects. For each project, a research group was convened, and its achievements were published in the bulletin *Keio Media and Communications Research* and *Keio Communication Review*, as well as in authored publications. Members of the Institute hosted the 21COE-CCC International Symposium held on the Mita campus from November 25 to 26, and also participated in its discussions. The bulletins of the Institute are not only published physically, they are also offered in digital format on the Institute's home page.



Portion of research results

In FY2006, published material of the Institute included *Keio Media and Communications Research* No. 57 (March 2007); *Keio Communication Review* No.29 (March 2007); *International Exchange of Culture and Civic Consciousness* edited by Youichi Ito (Keio University Press, January 2006, 21COE-CCC *Library Dynamic State of Civic Consciousness in a Multicultural World* Vol. 18); *Digital Contents in a Transnational Era* edited by Minoru Sugaya and Tatsushiro Shukunami (Keio University Press, March 2007, 21COE-CCC *Library Dynamic State of Civic Consciousness in a Multicultural World* Vol. 19); *Capital Formation and Civic Consciousness in Net-Era Society* edited by Minoru Sugaya and Tomoko Kanayama (Keio University Press, March 2007, 21COE-CCC *Library Dynamic State of Civic Consciousness in a Multicultural World* Vol. 20); *Communication Research: Media in Society* 2nd Ed. by Yutaka Oishi (Keio University Press, April 2007); *Location of Media Transnationalism: Investigating China-Japan Friction* edited by Yutaka Oishi and Nobuto Yamamoto (Asahi Shimbun Company, October, 2006, Asahi Selected Book Vol. 807); *Power and Journalism* edited by Yutaka Oishi (Sekaishisosha Co., December 2006); and *Community Media* edited by Tomoko Kanayama (Keio University Press, March 2007).

<http://www.mediacom.keio.ac.jp/english/about.html>

Keio Economic Observatory

The Keio Economic Observatory (KEO) was established in 1959 on the occasion of the 100th anniversary of the founding of Keio University. Its purpose since its inception has been to conduct theoretical and empirical research on the economy and industries in the context of Japan's existing economic conditions.

The KEO consists of research sections; economics, law, and behavioral science. Full-time staff and research members from faculties convene on a project-basis to perform research.

In recent years, the Observatory has carried out distinctively international research based on a uniform framework that span the construction of databases to the development of analysis methods and simulation of policy. In FY2006 especially, for the construction of an international dataset on economy, energy and environment, the KEO expanded its capabilities using the accumulation of the dataset as its focus, and performed analysis through academic exchanges with various institutions such as OECD and the National Bureau of Statistics of China. Its findings were transmitted to the world.

Research results have been published and disseminated in volumes such as *the Library of Keio University Sangyo Kenkyujo*, *KEO Monograph Series* and *Keio Discussion Papers*. The KEO also holds regular seminars which are becoming places to report findings and exchange viewpoints among researchers.

From the standpoint of fostering human talent, the KEO seeks to create collaborations among a wide range of researchers that transcend nationality and age differences by enhancing its intake system for young researchers who include research fellows and students under training.

http://www.sanken.keio.ac.jp/index_e.html

Shido Bunko, Institute of Oriental Classics

Shido Bunko, or the Institute of Oriental Classics, is affiliated with Keio University. In addition to the director, the Institute has six academic members and three temporary researchers. The staff of the institute investigates Japanese and Chinese classical works stored in Japan and abroad, collect them by means of microfilming and digitizing, and inspect them using standard bibliographical methods. *Shido Bunko* maintains a special library that contains 140 thousand volumes of books and six thousand reels of microfilm; it is open to the public. In addition to these activities, for graduate students the staff provides three "Shido Bunko Courses" each Spring and Fall semester. The course instructors use lectures and exercises from which students may master bibliographical methods by using real classical materials.

In 2006, using research grants from the Ministry of Education, Culture, Sports, Science and Technology (MEXT), members of Shido Bunko visited the People's Republic of China, the Republic of China and the United States of America to study archives of ancient text. One member also worked as a lecturer in Columbia University (U.S.)'s summer course. On November 2, Shido Bunko held its annual open lecture, entitled "Conservation and Repair of Ancient Texts." This talk featured Mr. Yuji Takahashi, curator of historical documents at Tokyo National Museum.

Bulletin of the Shido Bunko Institute No.41 was issued in February 2007, and *A Catalog of annotated books for Kokin-shu* was published by Bensei Publishing in February 2006.

<http://www.sido.keio.ac.jp/>

International Center

The International Center is at the core of Keio University's international activities. It is responsible for sending numerous students and scholars abroad every year, as well as welcoming those coming to the University. The Center provides support to international students on both academic and lifestyle levels, and is also in charge of exchange programs and overseas short-term research programs. For that purpose, it holds information sessions on studying abroad in general, and also provides information on exchange programs.



Xi'an Jiaotong University Chinese language and culture summer course (September 2006)

In addition, in the International Studies and Japanese Studies courses, the Center conducts various lectures and seminars on international topics and Japanese culture, history, politics, and economics in English, in order for both international students and Japanese students to understand different cultures.

Besides formal educational activities above, in 2006 one of the professors at the Center, researching intercultural communication, became concurrent members of the Keio Research Center for the Liberal Arts. She participated in the "Mita no le" Project, as one of the "Designing Inter-campus Projects," and provided opportunities for cultural exchange between international and Japanese students. The "Mita no le" seeks to connect the University with the local community. It is a lounge-like classroom outside the campus where diverse people can conveniently meet and study together.

<http://www.ic.keio.ac.jp/en/index.html>
<http://mita.inter-c.org/>

Teacher Training Center

The Teacher Training Center acts as a Keio University-wide magnet for attracting educational and scholarly activities in all areas of school education. The Center provides a teacher-training course for college students who intend to be high school teachers, and has produced many outstanding teachers since its founding in December 1982. It is not only a "teacher's college," but is also a research institute for teacher education in Keio University. Accordingly several research projects concerning educational issues are carried out by the Center.

The main research theme at the Center since 2004 has been the assessment of the suitability of student teachers for the teaching profession. The Center has also developed an advanced curriculum for teacher-training courses since FY2005. Based on these two research efforts, the Center's project "Logbook for the Ideal Teacher," which seeks to develop a multi-assessment system of aptitude for the teaching profession, has been selected for the "Nurturing of Outstanding Teachers Program" (FY2006-2007) by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) since FY 2006. This project has been undergoing its field test phase since the end of FY2006. With the cooperation both within and without the University, in FY2006 the Center offered a continual lecture series "Conversations with Society and Third-Parties" and a training forum for nurturing teachers. From FY2006, it also started implementing an achievement test in social science for prospective student teachers.

The successive results of these efforts demonstrate the fruition of the Center's activity in the development and improvement of teacher-training curricula and programs. The Center also returns its fruits to society through public research groups and the summer seminar for active teachers. The Center published its *Annual Report* No. 16 (March 31, 2007).

<http://www.ttc.keio.ac.jp/>

Fukuzawa Memorial Center for Modern Japanese Studies

The Center has three major roles in the activities of the University. The first role is to serve as a University archive that collects, organizes, and stores the historical documents of Keio University and of its founder, Yukichi Fukuzawa. The second role is to provide a research institute in which scholars may study a comprehensive selection of modern Japanese history related to Fukuzawa and Keio University. The third role is as an educational organization that returns the fruits of these scholarly activities not only to the students but also to the public through its courses, lectures, and seminars.

Since 2005, the Center has provided special courses at the Mita campus. In 2006, the courses were "Modern Japanese Studies": "The Encouragement of Learning" and Its Era, the origins of *To Be Independent and Self-sufficient*, seminars on Fukuzawa text "Popular Discourse on People's Rights" and "Popular Discourse on National Rights", seminars on Fukuzawa's letters, and two courses on "Fukuzawa and the idea of womanhood in the Meiji Era." The University has approved these courses; as such, students will receive credits towards their graduation for enrolling in the Center's courses.

As part of its research activities, since its founding the Center has continued to uncover and collect material kept privately by families related to students of Yukichi Fukuzawa. Also in recent years, to bring its research into public view, the Center has held lecture series and seminars on unified themes such as entrepreneurs in the early-modern era and Yukichi Fukuzawa, and law in the Meiji era and Yukichi Fukuzawa. These lectures and seminars invited researchers from abroad, and has contributed to the influence of Keio University and Yukichi Fukuzawa to world intellectual history of the early-modern period.

The Center's staff is continuing editing the 21-volume collection of historical data of Keio University, as part of the Center's preparations to commemorate in 2008 the 150th anniversary of the founding of the University. The investigation, organization, and analysis of material both within and outside the University have produced a collective effort in this endeavor. For its publications, the Center issued *Bulletin of Modern Japanese Studies* No. 23 (2006) and *Newsletter of Fukuzawa Memorial Center for Modern Japanese Studies, Keio University* (published twice a year).

<http://www.fmc.keio.ac.jp/fmc/eng.html>

The Keio Institute of East Asian Studies (KIEAS)

The Keio Institute of East Asian Studies (KIEAS) supports four research projects each year. The following four projects were conducted in 2006: "New Perspectives on China's Medium and Small-Sized Enterprises," "Modern Japan's Legal and Political Thoughts: In Search of a Re-evaluation of Fukuzawa Yukichi," "The Possibility of Intermediary Organizations and Pluralistic Civil Society in Asia and Latin America," and "Reconstruction of Religious Culture in East Asia." Each project presents its research results at academic forums held annually at the Institute. It is also an obligation of each project to publish its findings as an academic book.



Japan - Korea Symposium, "Possibilities of Peace-Building in Northeast Asia"

In 2006 the Institute held international conferences such as an emergency discussion session on Northeast Asian affairs and a joint international symposium with the Japan Association for Asian Studies. The Institute also hosted a lecture series, aimed toward a wide audience, on the theme "Japan and the Early-Modern Era of East Asia." Besides these events, the Institute regularly holds talks and seminars open to the public. Please check our homepage which provides information of activities held by the Institute, including seminars and lectures.

<http://www.kieas.keio.ac.jp/>

Center for Japanese Studies

The Center for Japanese Studies offers Japanese language and Japanese studies courses to international students. In addition, research on various topics related to second-language education is carried out, as well as the education and training of next-generation Japanese language teachers.

The Center is in charge of the Japanese language and culture courses offered at the University, and of the 188 students, coming from 27 countries and regions, who participate in its Japanese Language Program. It also holds Japanese language courses for the international students enrolled in the undergraduate program at the Hiyoshi campus and in graduate studies at the Graduate School of Science and Technology at the Yagami campus. The Center also implements various courses for those who participate in the Program for Teaching Japanese as a Foreign Language.

In the 2006 academic year, the Center published *Nihongo to Nihongo Kyoiku No. 35 (Japanese and Japanese Language Education, March 31, 2007, ISSN 0286-5742)*.



Nihongo to Nihongo Kyoiku No. 35 (Japanese and Japanese Language Education, March 31, 2007, ISSN 0286-5742)

<http://www.ic.keio.ac.jp/nncenter/>

Research Center for the Arts and Arts Administration

The Research Center for the Arts and Arts Administration at Keio University is a research center that pursues the arts such as the fine arts, architecture, music, literature, theater, cinema, and dance, as well as their cultural appreciation in contemporary society from a holistic and academic stance. The staff members, faculty members, and museum curators, in cooperation with experts, develop domain-transcending activities such as seminars, lectures, exhibitions, performances, workshops, case studies for art management, and construction of art archives. Their original style of research has brought forth fruitful results.



November 28 - December 9, 2006 Art Archive exhibition "Introduction to Archives, Note: HUKAKATA Tatsumi, TAKIGUCHI Shuzo, YUI Shoichi, and Noguchi Room"

In 2006, the research lecture "Best Friends — Buckminster Fuller and Isamu Noguchi" was held, as well as an exhibition from the Fuji Xerox print collection and Butoh performances. Also for one of the sub-projects of the Ministry of Education, Culture, Sports, Science and Technology (MEXT)'s Open Research Center improvement project "An Integrated Establishment of Digital Archives for the Humanities," the Center is expanding the archive model of "production process in art" and training archivists of culture records. For the project, it has also held exhibitions and discussions.

The result of the Center's research endeavors are released to the public through publications such as *ANNUAL REPORT 13* (54 pages, 2005/06), concentrating on reports of activities; newsletters *ARTLET No. 26, Note* (8 pages, issued October 1, 2006); *ARTLET No.27, Shoichi Yui and Aspects in Jazz* (8 pages, issued March 31, 2007); and a special-themed bulletin *Booklet No. 15, Publicness in Art: How to reorganize museums and cultural facilities in Japan?* (120 pages, issued March 31, 2007)

<http://www.art-c.keio.ac.jp/en/>

Global Security Research Institute (G-SEC)

The Institute carries out research activities based on the keywords "Global" and "Security" with a focus on three core projects. Its research seminars and symposia invite experts and businesspersons from industry, government agencies, and international organizations to concretely discuss topics concerning various fields and countries.



The Design the Future Fund Program "Changing Faces of Nationalism in Asia"

In March 2007, a workshop for doctoral students entitled "Changing Faces of Nationalism in Asia" was held. The two-day workshop invited two authorities in the field of nationalism research and 14 graduate students from seven countries. Its discussions from the viewpoint of theory, history, and well-researched studies provided an opportunity to search for the future shape of Asia and nationalism. Also, the Institute began collaborative research with the Energy and Resources Institute (TERI) in India. Along with sending a researcher abroad and providing technical guidance for input-output tables for environmental analysis, the Institute collected local data. Portions of the research results were published in the Global Security Research Institute Working Papers (GWP) in preliminary form to encourage discussions and suggestions to researchers both within and without the University.

1. Studies on Global Innovation Systems

This research focuses on the analyses and international comparisons of policies for R&D and innovation, the business administration of human resource allocation and leadership for innovation, and policies for environmental protection and innovative recycling.

2. Studies on Asian Security Systems

Research on this subject examines pluralistic and diverse security issues in East Asia with academic exchanges engaged with researchers from research institutes and universities in countries including the Philippines, Indonesia, and Singapore

3. Studies on Emerging Crises for Human Security

In cooperation with the European Commission Joint Research Centre's Europe Media Monitor working team, this research project aims to develop and apply a system that can timely monitor and analyze daily news, and create alerts of the world's current situations.

Symposia and Seminars

Innovation Workshops (4 times), Toa Road Corp. & IWD-sponsored research seminar "Risk and Premium in a Recycling-oriented Society" (12 times), "Security and Safety Science" – Infections and Bioterror Study Group (8 times), international conference "Japan's Asia Strategy and Soft Power" (October 24), public symposium "Thinking about Japan's Soft Power: The Challenge of the Post-Koizumi Era" (December 6), international symposium "International Efforts for Guarantee of Health and Safety" (December 7), Keio University 150th Anniversary Event/Design the Future Fund Program – international workshop for doctoral students "Changing Faces of Nationalism in Asia" (March 25 – 27)

http://www.gsec.keio.ac.jp/index_e.html

Research Institute for Digital Media and Content (DMC)

The Research Institute for Digital Media and Content (DMC Institute), established in 2004, promotes international research and collaboration under a project-based contract system. This project system focuses its research on contextual digital content from various perspectives such as: content design, media technology, network technology, and content policy.



Digital Content Studio

As part of pursuing its research in an international context, in addition to Tsinghua University in China and Yonsei University in South Korea in 2005, in 2006 the Institute established Global Studios in Cambridge, England, and in New York. Making use of the studios to transmit its research achievements internationally, the Institute held an international symposium entitled "Global sharing of Wisdom in the Digital Communication Era" in March 2006, and another entitled "Convergence: Towards A New Paradigm for Creative Society" in August 2006. The Institute is also pursuing next-generational video contents capability using 4K digital cinema in collaboration with businesses and other universities.

<http://www.dmc.keio.ac.jp/en/>

Institute of Physical Education

The Institute of Physical Education was established in 1961. It was founded with the purpose of developing University-level physical educational courses. At the same time, the Institute was, from the outset, expected to conduct a wide range of notable research into physical education and sports. Currently the Institute is pursuing five research projects. A collaborative academia-industry project sought to promote sports entrenched in local communities and to vitalize the economy by partnering with the professional soccer team Yokohama FC. This project was reported in Kanagawa Sports newspaper, and is attracting attention as an opportunity to develop new talent in the sports world. A project for evaluating physical attributes and sports ability, entitled "The Road to a Nice Body," is continuing. By offering exercise physiology feedback data, the project is stimulating students' awareness of their health. The Institute has also begun joint projects with Keio primary and secondary schools, technology improvement projects, and research projects in the humanities and social sciences concerning physical education and sports.



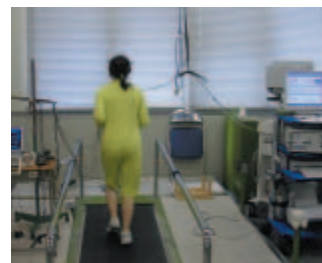
Construction of combined wing (Fujiyama Memorial Hall)

Regular publications of the Institute are the *Bulletin of the Institute of Physical Education* and *Activity Report of the Institute of Physical Education*.

<http://www.hc.keio.ac.jp/ipe/>

Sports Medicine Research Center

Founded at the Hiyoshi campus in 1988, the Sports Medicine Research Center conducts research and clinical studies in sports medicine and science with a central focus on health. For studies commissioned by industry, the Center regularly conducts collaborative research with the School of Medicine and the Faculty of Science and Technology.



Testing in progress for research on functional sportswear

From 2004 and continuing into 2006, the Center is conducting joint research (with Fast Retailing Co., Ltd.) on functional sportswear and on human ergonomics. As a result of research, the project produced high-functional wear that went on sale from June 2005. Research on higher value-added wear is continuing from 2006. In 2006, the Center was also responsible for the preparation and analysis of experiments in a collaborative research project on sleep. The Center is also continuing its creation of evidence-based wellness guidance manuals for different specialized areas. This project is intended as a new health-related business enterprise.

Academic publication: *Bulletin of the Sports Medicine Research Center*

<http://www.hc.keio.ac.jp/sports/>

Health Center

The Health Center's research is divided into aspects of physical and mental health.

The Center is continuing its research into hypertension, diabetes, metabolic syndromes, lifestyle diseases such as obesity, anorexia nervosa, cardiac diseases, liver diseases, infectious diseases, stress, and mental disorders.

The Center collaborated internationally on research on high blood pressure, strokes, and metabolic syndromes; research papers were published (Nestel P, Saito I et al: *Asia Pac J Clin Nutr* 2007; 16: 362-367, Liu SL, Saito I et al: *Int J Stroke* 2006; 1: 150-157). On the mental health front, the Center is preparing a paper comparing eating disorders in Japan and the U.S.

Domestic-focused research was also presented at international conferences, and the Center is seeking to disseminate its papers in English. In 2006, it participated in the conferences of the International Society of Hypertension, the European Society of Hypertension, the Endocrine Society (U.S.), and the Asia Pacific All board meeting.

The Center publishes *Keio Health Research* and the *Annual Report of Keio University Health Center* once a year.

<http://www.hcc.keio.ac.jp/hc-e.htm>



Health Center reception window (in Hiyoshi campus)

The Keio Research Center for the Liberal Arts

The Keio Research Center for the Liberal Arts was founded in July 2002 to search for the ideal form and contents of the "liberal arts" to pass down to following generations. Thus far, it has conducted various full-fledged research and analyses, suggested new systems and curricula based on proposals brought about by the research, and examined the educational efficacy of those proposals through experimental classes and induction courses.

There are three research programs conducted by the Center: the "Core Research Program," "Specialized Research Program," and "Individual Research Program." The "Core Research Program" has run two research projects starting in the academic year 2005. One is "Research on the Curricula of Keio University" which investigated the actual situation of cross-departmental courses at Keio University. Another project, "Body and Mind," has tried to establish a new "scientia" concerning a holistic approach to students' personal development. The project aims to theorize the new "scientia" through experimental classes. "Specialized Research Program," or "Multi-lateral Research on Meta-Representative Culture," as a part of the Academic Frontier Promotion Projects under the Ministry of Education, Culture, Sports, Science and Technology, started its second phase in 2005. Its goal is to make model contents and campus environments for higher education and to make available the results in various media.

The Center also actively exchanges opinions and works with other academic institutions in Japan and abroad.

<http://www.hc.keio.ac.jp/lib-arts/en>



Faculty Development Seminar

Keio Research Center for Foreign Language Education

The Keio Research Center for Foreign Language Education was founded in October 2003. One of the Center's primary missions is to consider foreign language education across all Keio affiliated schools, from elementary school to graduate school. Currently, the Center has six major research projects: (1) Language Education Policy Project, (2) Plurilingual and Pluricultural Competence Development Project, (3) ELT Coordination Project, (4) Intercultural Communication Project, (5) Action Oriented Autonomical Learning Project, and (6) Digital Contents Project.

The Center's "Action Oriented Plurilingual Language Learning Project" was selected as the Ministry of Education, Culture, Sports, Science and Technology's "Academic Frontier" Project in 2006. The "Action Oriented Plurilingual Language Learning Project" views language education from elementary school to graduate school holistically, and seeks to propose a better-integrated language curriculum throughout the students' educational career. Another aim of the project is to provide students with communication skills that will enable them to better function in a plurilingual environment. To create individuals who can thrive in today's international world, the Keio Research Center for Foreign Language Education seeks to provide an action-oriented approach toward language learning in three ways, through: language education policy making, pedagogy development, and improvement of language education facilities.

Publication: *Journal of Foreign Language Education, Newsletter, Summary of Research Activities*

<http://flang.keio.ac.jp/>



Symposium: "Keio University Foreign Language Education: The Ideal Graduate"

Hiyoshi Research Portfolio 2006

Hiyoshi Research Portfolio (HRP) 2006, whose mission was to create a meeting ground for connecting the University and society so as to exchange and produce new values and new "scientia," was held at the Hiyoshi campus on December 15, 16, and 18, 2006. Besides poster sessions by research groups and individual researchers, four symposia were held in which many participants took part. The HRP, held for the second time, simultaneously presented information such as posters on the Web.



Scene at HRP 2006

Graduate School of Business Administration

The Graduate School of Business Administration hosts several research projects. Two examples are presented here. First, as part of Keio University's 2006 advancement of graduate research plan, the school carried out joint research for its "Holistic Analysis of Strategic Decision-Making" project (continued from the previous year), in which six members of the School participated. This research, spanning two years, investigates decision-making methods from aspects such as business management and human organization. The School also worked on its "Keio-style case method" for MEXT's "Distinctive Graduate Education Assistance Program." This project has two hopes. One, the School hopes to develop the Harvard case method to be a style more suited to Japan's economic and business climate, and thus develop revolutionary leadership in Japanese business and non-profit sectors. Another hope is to contribute to the advancement of practical graduate education that transcends the business school setting.

Main publication: *Keio Business Review*

<http://www.kbs.keio.ac.jp/english/index.html>



Results from research of case method classes

Other Journals (in Japanese) on Mita and Hiyoshi Campuses

Journals Issued by Faculties and Academic Associations on Mita Campus

Shigaku (The Historical Science)

Philosophy

A Literary Magazine Mita Bungaku

Library and Information Science

Journal of Arts and Letters

Mita Journal of Economics

Journal of Law and Political Studies

Studies in Sociology, Psychology and Education

BC Mita Business Review

Keio Business Review

Hiyoshi Review

Hiyoshi Review
<http://review.keio-up.co.jp/>



Yagami Campus

Aspiring and Working for the Next Frontiers of Science and Technology

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<http://www.kll.keio.ac.jp/liaison/index.html>

Faculty/Graduate School of Science and Technology

The Faculty and Graduate School of Science and Technology is located at the Yagami Campus, where research and education centered on scientific and technological fields are conducted. In accordance with the principle of pursuing "emerging" themes, work on the campus will continue to be more open and multifaceted, in the form of joint studies into various issues in as-yet-unknown interdisciplinary areas that go beyond conventional fields of specialization. Our mission is to foster human resources; to have researchers not only study the leading edge, but also open it up for themselves and become leaders of society. <http://www.st.keio.ac.jp/>



Keio Leading-edge Laboratory of Science and Technology (KLL)

The Keio Leading-edge Laboratory of Science and Technology (KLL), a stage for industry-government-academia collaboration, was established at the Graduate School of Science and Technology in 2000 as a center for leading academic research and new business creation in science and technology. Its goal is to return research achievements to society, to conduct research activities that transcend areas of specialization, and to provide networking forums with the industrial world. The KLL has promoted and advanced research projects which are based on the originality of Keio University and take advantage of its strength as a comprehensive university. <http://www.kll.keio.ac.jp/>



Here is an introduction to the activities of the KLL.

Activities of the KLL

Coordination for Research Work

The KLL acts as a point of contact between Keio University and groups outside of Keio University such as industrial circles, promoting cooperation for research work in the pre-patent, or germination, stage. It promotes the research activities of the Yagami Campus from various perspectives (see <http://www.kll.keio.ac.jp/>), flexibly responds to individual consultations, and establishes an interactive flow between enterprises and university research activities. By utilizing these dynamics, the KLL coordinates optimal joint and commissioned research projects, both domestic and international.

Promotion of Research Activities

With the objective of focusing on the development of "germinating" research areas that are expected to be important to society in the future, the KLL calls for research projects (page10, "KLL Specified Research Projects"), and advances research aggressively and systematically in terms of both finances and research environment. In order to more vigorously advance general research projects that have been established, "KLL Research Space" is loaned on a fee-paid basis. There is usable space in the Sousoukan of the Yagami Campus (a total of 2,519m² available; see page 34), as well as on the Shin-Kawasaki Town Campus. Furthermore, researchers from corporations and elsewhere outside of the University who participate in research are granted the status of "Researcher of KLL." They are able to perform research activities smoothly at Keio by, for example, utilizing the Information and Media Center for Science and Technology (library).

Fostering Young Researchers

In order to foster outstanding researchers in science and technology, the KLL offers research aid in the form of Research Grants for Doctoral Programs, which assists research activities performed by doctoral students. In FY2006, the KLL extended grants of ¥300,000 each to 114 students, thereby financially assisting the start of research activities by the students as bona fide researchers.

(In 2007, KLL will offer a Research Grant for Master's Programs. This program will subsidize a portion of travel expenses for students who present papers at international academic conferences.)

Returning of Research Achievements to Society

Every December, the KLL holds the Keio Techno-Mall, an exhibition aimed at corporate managers. The exhibition introduces research achievements and explores ways to generate new businesses. In 2006, there were 57 booths and 12 panels introducing research achievements and over 1,200 attendees. (The Keio Techno-Mall 2007 is scheduled for 5 December 2007 at the Tokyo International Forum in Yurakucho.) In cooperation with the Intellectual Property Center, the KLL supports the patenting and commercialization of research achievements and fulfills the cycle of intellectual creation by returning the achievements to society.

KLL Specified Research Projects (For projects launched in 2006. Titles were given at the time of selection.)

The "KLL Specified Research Projects" is a grant program designed to bring up research projects that should lead to the developments of society in the next generation. Following the grant period, the Projects should enable promising future research frameworks. Within three to five years full scale research should be initiated. Some of the projects for which the grant period has been completed are starting to bear results.

Started in FY2004 (Research to Explore Next-generation Cutting-edge Areas)

"Simulation Method for Prediction of Explosion Damage"

Akiko Matsuo, Associate Professor, School of Science for Open and Environmental Systems

"Optical Detection of a Single Pair of Charge-transfer Molecules for Angstrom Resolution Bioimaging"

Toshiharu Saiki, Associate Professor, School of Integrated Design Engineering

"Development of the Next Generation of Microfluidic Device for Selective Separation of Specific Material"

Yohei Sato, Associate Professor, School of Integrated Design Engineering

"Rectification of Radio Frequency Current and Magnetization Oscillation Induced by DC Current in a Ferromagnetic Wire"

Akinobu Yamaguchi, Instructor, School of Fundamental Science and Technology

"Material Design for Quantum Computing Devices of Photofunctional Single-Molecule Magnets"

Takashiro Akitsu, Instructor, School of Integrated Design Engineering

"Studies on Isolation of Novel Bioactive Substances and their Biological Functions"

Kiyotake Suenaga, Associate Professor, School of Fundamental Science and Technology

"Development of ER Gel and its Application to Haptic Element for Medical Devices"

Yasuhiro Kakinuma, Instructor (fixed-term), School of Integrated Design Engineering

"Damage Detection of Reinforced Concrete Beam Based on Impact Excitation"

Masayuki Kohiyama, Assistant Professor, School of Science for Open and Environmental Systems

"Autonomous Reconfiguration Method of Control System for Mechanical System"

Masaki Takahashi, Instructor, School of Science for Open and Environmental Systems

"Development of Thermophysical Properties Sensor using Optical MEMS"

Yoshihiro Taguchi, Instructor (fixed-term), School of Integrated Design Engineering

"Establishment of Systems Physiology --Towards understanding of Rhythmic Myoclonus--"

Junichi Ushiba, Instructor, School of Fundamental Science and Technology

"Development of Novel Host-Defence Protein by Molecular Evolutionary Approach"

Kohji Hotta, Instructor, School of Fundamental Science and Technology

"Molecular Interaction between Biomolecule and Glycolipid Nanodomain in Plasma Membrane"

Teruhiko Matsubara, Instructor, School of Fundamental Science and Technology

"Design and Construction of Artificial Genetic Networks based on Systems/Synthetic Biology"

Katsuyuki Yugi, Instructor, School of Fundamental Science and Technology

Started in FY2006 (Research to Explore Next-generation Cutting-edge Areas: One-Year Projects)

"Controlling Phase Equilibrium Conditions in Clathrate Hydrate Forming Systems Based on Compatibility of Guest-Molecular Size with Host Lattice Structure"

Ryo Ohmura, Assistant Professor, School of Science for Open and Environmental Systems

"Viscoelasticity and Structure Analysis of New Peptide Amphiphiles"

Atsushi Hotta, Assistant Professor, School of Science for Open and Environmental Systems

"Development of Micro Reactors for Artificial Organs"

Norihsa Miki, Assistant Professor, School of Integrated Design Engineering

"Development of the Highly Sensitive Automatic Continuous Monitoring System for Hazardous Trace Metals in Atmospheric Particulate Matter"

Tomoaki Okuda, Instructor, School of Science for Open and Environmental Systems

"Detection and Control of a Spin Current in Nano-Structured Metallic Systems"

Eiji Saitoh, Assistant Professor, School of Fundamental Science and Technology

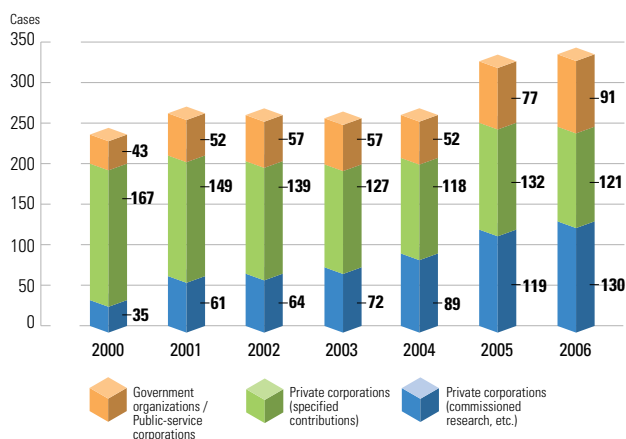
"A Research on Closed-Loop Supply Chain Management System"

De-Bi Tsao, Professor, School of Science for Open and Environmental Systems

"Laser Cooling and Application to Quantum Computations of Doubly-Charged Lanthanum Ions"

Taro Hasegawa, Assistant Professor, School of Fundamental Science and Technology

Number of Commissioned Research and Other Cases Received (FY2000-FY2006)



KEIO TECHNO-MALL 2006 "RE-FOCUSING YOUR TRACKS"



"Researchers discussing their work with guests"



"Techno-Mall in progress"

Commissioned Research Projects (excerpt) (Titles are given at the time of selection.)

"Development of Natural Unnatural Compound Library and Screening of Pharmaceutical Lead Compound from the Library"

New Energy and Industrial Technology Development Organization & Oxygenix Co., Ltd. Masaya Imoto, Professor, School of Fundamental Science and Technology

"A Study on Inter-Chip Communications by Using Inductive-Coupling Channel"

Japan Science and Technology Agency Tadahiro Kuroda, Professor, Integrated Design Engineering

"Development of Devices and Modules for Motion Control"

New Energy and Industrial Technology Development Organization Nobuyuki Yamasaki, Associate Professor, School of Science for Open and Environmental Systems

"Development of Wavelength-Multiplexing High-Speed Photonic Integrated Circuits"

New Energy and Industrial Technology Development Organization & Nozomi Photonics Co., Ltd. Hiroyuki Tsuda, Associate Professor, School of Integrated Design Engineering

"A Large-Scale Analysis of Transcription Factor Complexes by In Vitro Virus Method"

Ministry of Education, Culture, Sports, Science and Technology Hiroshi Yanagawa, Professor, Fundamental Science and Technology

"Development and Practical Implementation of Multianalyte Sensing Systems for Medical, Food and Environmental Analysis"

Japan Science and Technology Agency Koji Suzuki, Professor, Integrated Design Engineering



Shinanomachi Campus

Center for Translational Research: From Bench to Bed

Office of Research Administration at Shinanomachi

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E-mail: k-msf@adst.keio.ac.jphttp://www.ms-fund.keio.ac.jp/index_jp.htm

Shinanomachi Campus

The Shinanomachi Campus houses various education, research and treatment facilities, including the School of Medicine, the Faculty of Nursing and Medical Care, the Graduate School of Medicine, and the University Hospital. The Center for Integrated Medical Research has laboratory spaces called Research Park promoting research in life-sciences fields, allowing researchers from various different fields to form research groups, and promoting strategic joint research based on common objectives among the medical and life sciences. Center for Clinical Research for supporting clinical trials and translational research is planned to be established in a new building in the Campus.

<http://www.sc.keio.ac.jp/index-en.html>

School of Medicine and Graduate School of Medicine

The School of Medicine was inaugurated in 1917 as the Keio University School of Medicine, with world-renowned bacteriologist, Shibasaburo Kitasato as Dean. To overcome problems arising from having independent departments, Professor Kitasato instituted a large-class system of organization, stressing cooperation between basic and clinical medicine and also the practice of medicine as a practical science. The Graduate School of Medicine, doctoral course was established in 1956, and a master's course in 1994, to provide education for high-level specialists and researchers in various fields related to medicine and medical treatment.

<http://www.med.keio.ac.jp/index-e.html>

Center for Integrated Medical Research

The Center for Integrated Medical Research aims to develop interactions among different research fields including medical science, science and technology, social science, and environmental information engineering, and also to contribute to the society by returning fruits of the research activities at Keio. Researchers from various backgrounds who share the same objective join a variety of projects by renting spaces in the Research Park.

http://www.cimr.med.keio.ac.jp/index_e.htm

Center for Clinical Research (CCR)

This is a new organization by which the School of Medicine and the Keio University Hospital, in an integrated manner, strive to conduct clinical trials and clinical / translational research in order to contribute to developing innovative cutting-edge treatments and epoch-making new drugs. The center also provides professional higher education / training and functional support to enable the said research activities. The support and assistance from the center purports to be systematic, so that clinical research and trials by individual investigators / clinical departments and by the school of medicine, the Keio University Hospital and affiliated facilities can both be comprehensively covered.

<http://www.ccr.med.keio.ac.jp/>

Keio University Hospital

The University Hospital contains 27 treatment departments and 13 central treatment groups, handling an average of 4,000 out-patient visits per day, and an average of 950 in-patients. The hospital also accepts over 20,000 emergency patients a year, and handles over 6,900 general-anesthetic surgery cases per year. The hospital also provides advanced treatments as a tertiary hospital, and through staff exchanges and medical collaborations with 110 hospitals all over Japan, provides regional medical care as well.

<http://www.hosp.med.keio.ac.jp/>



Shinanomachi Campus



Kitasato Memorial Medical Library (White-gown ceremony)



Center for Integrated Medical Research

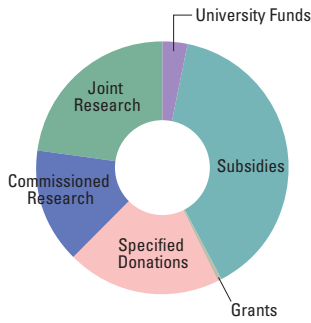


CCR will be located in the new building, which will be built in 2008



University Hospital

Research Funds at Shinomachi Campus



(All yen amounts in thousands)

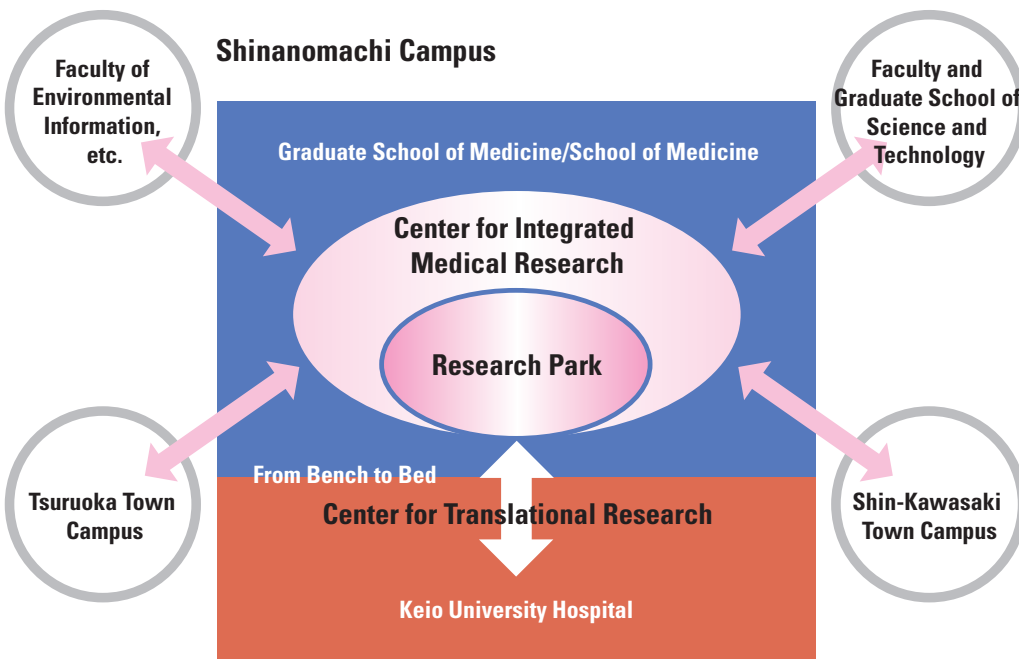
University Funds	202,743
Subsidies	2,672,092
Grants-in-Aid for Scientific Research from the MEXT	1,243,020
Grants-in-Aid for Scientific Research from the MHLW	698,491
21st Century COE Program	466,763
Grants	34,200
Specified Donation	1,821,787
For Endowed Laboratories	589,450
Commissioned Research	951,574
Joint Research	1,426,916
Total	7,109,312

Endowed Laboratories in the School of Medicine and Graduate School of Medicine

- Advanced Cardiac Therapeutics
- Nisshin-Kyorin Asahi Medical Clinical Research Center of Inflammatory Bowel Disease
- Kampo Medicine
- Bridgestone Laboratory of Developmental and Regenerative Neurobiology
- Johnson & Johnson Ocular Surface and Visual Optics
- JMM Musculoskeletal Reconstruction and Regeneration Surgery
- Inaida Research Center for Anti-aging Medicine in Hepato-Gastroenterology
- Endocrinology and Anti-aging Medicine
- Center for Gastroenterology and Clinical Oncology Research (CGCOR)
- Novartis Pharma Program for Clinical Therapeutics of Hematologic Malignancy
- Department of Cell Biology and Neuroscience
- Cancer Stem Cell Research Institute of HanKookSin Yak Pharmaceutical Co.Ltd
- Department of Advanced Treatment for Spine and Spinal Cord Diseases

Joint Research Projects

- Novartis Pharma K. K.**
Exploratory research for new therapeutic targets in cardiorespiratory medicine
- Institute of Medicinal Molecular Design Inc.**
Renoprotective Drug Development targeted to NF-κB
- Daiichi Sankyo Co., Ltd.**
Keio-Daiichi Sankyo Project on Genetics of Thrombosis
- Toshiba Medical Systems Corporation**
Non-invasive radiotherapy and diagnostic system for cancer management
- Chugai Pharmaceutical Co., Ltd.**
Toward a molecular understanding of signaling systems in bone and cartilage development
- GE Yokogawa Medical Systems Ltd.**
Improvement of individualized medicine by use of multi-dimensional non-invasive imaging with CT/MR
- Otsuka Pharmaceutical Co., Ltd.**
Keio Stroke Research Center: The Comprehensive Research Projects for Brain Ischemia
- Otsuka Pharmaceutical Co., Ltd.**
Basic Research and development of novel therapies for digestive diseases
- CANON Inc.**
Development of DNA chip and its application
- Nipro Corporation**
Research & Development of Artificial Oxygen Carrier
- Eisai Co., Ltd.**
Keio Alzheimer Research Center: The Comprehensive Research Projects for Dementia
- NOEVIR Co., Ltd.**
"NOEVIR-Keio Translational Research Laboratory, Department of Cell Biology and Neuroscience"
- Asubio Pharma Co., Ltd.**
Regeneration of cardiomyocytes from human and marmoset ES cells and its transplantation for the treatment of heart failure



Seminar



Research Park



University Hospital

Keio University Medical Science Fund

In 1994, Dr. Mitsunada Sakaguchi, a 1940 alumnus of the School of Medicine, donated five billion yen to Keio, expressly to encourage medical research and creative progress at the University and to promote worldwide medical advances. To fully reflect Dr. Sakaguchi's commitment to medical progress, the University launched the Keio University Medical Science Fund on April 1, 1995. Furthermore, in July 1999, two billion yen were added to the Fund, for a total operating amount of 7 billion yen.

Keio Medical Science Prize

The Keio Medical Science Prize is awarded to researchers in recognition of their outstanding achievements in the fields of medical or life sciences. No consideration is given to nationality. The Keio Medical Science prize consists of a certificate of merit, a medal, and a monetary award of 20 million yen. The award ceremony and commemorative events are held at Keio University in the presence of invited guests.





Research Centers

Shonan Fujisawa Campus (SFC)

Contributing to Social Development with Cutting-edge Research Based on Interdisciplinary Cooperation

For Inquiries and Document Requests:

**Office of Research Administration,
Shonan Fujisawa Campus**
TEL: +81-466-49-3436
FAX: +81-466-49-3594
Participation in research activities:
E-mail: info-kri@sfc.keio.ac.jp
Keio Research Institute at SFC website:
<http://www.kri.sfc.keio.ac.jp/en/>

SFC

Keio University's fifth campus, SFC, was built in 1990 as a site for research and education based on completely new concepts adapted to the changing times. It includes the three faculties of Policy Management, Environment and Information Studies, and Nursing and Medical Care as well as the Graduate School of Media and Governance which opened in 1994. In order to produce top-quality professionals who will be pillars of 21st century society, SFC also opened the Graduate School of Health Management in April 2005. This school further expands and enhances the concept of the Faculty of Nursing and Medical Care by providing a program which enables graduates of the sciences and humanities alike to grapple with the broad theme of "health." Situated on a futuristic 330,000 square meter campus, SFC seeks to maintain a balance between the latest technology and a rich, natural environment. Research projects serve as the core of a participatory curriculum which instills students with specialized knowledge and practical skills.

<http://www.sfc.keio.ac.jp/index.html.en>

Keio Research Institute at SFC

The Keio Research Institute at SFC is an affiliate of the three faculties and Graduate School of Media and Governance which promotes research activities at SFC.

As a leading center of cutting-edge research in the 21st century, the Institute works to further enhance society's advancement by performing ground-breaking research based on interdisciplinary cooperation and by nurturing a two-way partnership between educational and research activities at the campus. This includes all related activities with industry, government, and academia both in Japan and overseas. Specific measures to achieve this include promoting joint research projects with other organizations and supporting venture incubation efforts. One of the unique aspects of the Keio Research Institute at SFC is its SFC Research Consortium, which encourages university-led collaborative research by multiple organizations. There are currently 16 such projects underway (as of 1 August 2007).

Additionally, the Institute was commissioned with 220 funded research projects amounting to approximately ¥1.7 billion from government agencies, local governments, and private companies in FY2006.

Researchers for these projects come not only from within SFC, but outside as well—approximately 300 visiting researchers conduct research at the Institute. The Institute is committed to presenting its research achievements widely to the public so that the results of its efforts flow back to society.

<http://www.kri.sfc.keio.ac.jp/en/>

Number of researchers: (as of 1 July 2007)

Full-time staff: 185

Researchers appointed with external funding: 101

Visiting Researchers: 328

Total: 614

Making Research Achievements Available to the Public

SFC Open Research Forum (ORF)

The Keio Research Institute at SFC believes returning research achievements to society to be an important social duty. In order to make achievements widely available to the public, the Institute annually organizes an SFC Open Research Forum where various research projects at the Institute are disclosed to industry, national and local government agencies, and academic society. The current status and future plans of projects are made public at the Forum through exhibitions, demonstrations, and symposiums. Furthermore, the Institute holds panel discussions between industrial and political experts and formulates proposals based on the discussions which it offers to society. These efforts aim to strengthen cooperation between industry, government, and academia and incorporate external feedback into the planning of future research projects. SFC Open Research Forum 2007 will be held November 22 (Thursday) and 23 (Friday, a public holiday) at Academy Hills 40, Roppongi Hills, Tokyo.

<http://orf.sfc.keio.ac.jp/>

Digital Art Awards

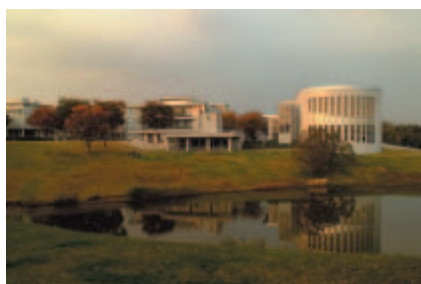
As the information technology revolution accelerates the spread of digital media, there is an increasing demand for digital content, such as films, animation, and interactive games.

The Digital Art Awards 2007 (DAA 2007), presented by Keio Research Institute at SFC, is designed to encourage, support, and promote digital content produced by creative students. The competition aims to become an international gateway to success for students who will lead the next generation digital content industry. The sixth annual competition is currently inviting innovative and experimental digital works in four categories: "Digital cinema," "Interactive," and "Digital Music." and "High School Students." Winners of the Digital Art Awards 2007 are presented with their awards at the SFC Open Research Forum (ORF).

Yellow Pages

In order to introduce the various research activities at SFC to a broader range of people in industry and other external organizations, Keio Research Institute at SFC is preparing the "SFC Research Yellow Pages", a Web search service that allows users to search for research projects by keyword or researcher name. By creating opportunities bringing societal needs together with SFC research activities, we hope to encourage cross-discipline research, with the products of new research and related benefits like technology transfer and development of new businesses.

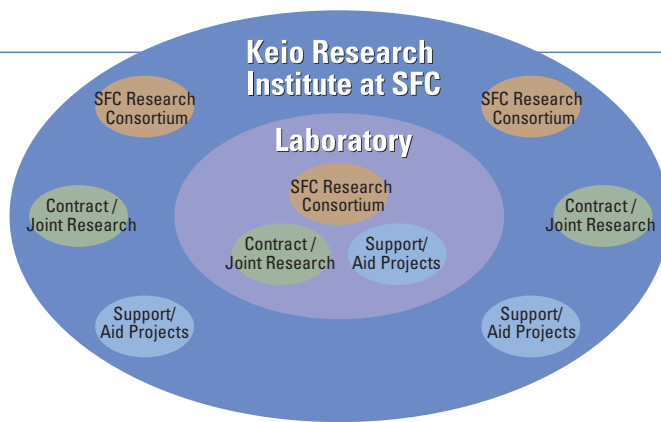
<http://www.kri.sfc.keio.ac.jp/kris-yp/>



SFC Open Research Forum 2006



Yellow Pages



World-Leading Fusion Research Technology

Laboratory

The Keio Research Institute at SFC is proud of having laboratory system which enables SFC's researchers to form research groups of those who have different academic backgrounds yet share the same research interests and objectives. These groups carry out interdisciplinary collaborative research projects.

Currently, the following 15 laboratories are in operation:

- Career Resource Laboratory
- Internet Research Laboratory
- Geo-informatics Laboratory
- Digital Cinema Laboratory
- Bioinformatics Laboratory
- Auto-ID Laboratory
- Ubiquitous Computing & Communication Laboratory
- Platform Design Laboratory
- Healthcare Informatics Research Laboratory
- Keitai Laboratory
- SIV Entrepreneur Laboratory
- Interaction Design Laboratory
- Open Wireless Broadband Platform Laboratory
- Community Collaboration Laboratory
- From SFC: Web-based Social Survey Report Laboratory

<http://www.kri.sfc.keio.ac.jp/en/activity/laboratory.html>

SFC Research Consortium

SFC Research Consortium conducts joint research projects which tackle large issues under the premise of mutual benefit. The University takes the initiative in deciding a research topic and invites participation from multiple external organizations including business and government, to extend efforts beyond a single field of study.

Currently, the following 15 consortium projects have been organized:

- Building Conceptual Media and Application Systems
- VCOM
- Research on Advanced Next-generation Internet Architecture
- Building Advanced Information Infrastructure
- VSI(Virtual Systems Institute)
- Sharing Human Intellect Project
- E-CELL Consortium
- DVTS (Digitized Video Transport System) Consortium
- DMNET: (Digital Media Learning NETWORK)
- e-Care Consortium
- SIV Entrepreneur Education Research Consortium
- Interaction Design Research Consortium
- Ubiquitous Cinema Consortium
- Referenced Code Development for IMS/SIP system
- Multipurpose RFID Tag Platform Research Consortium

<http://www.kri.sfc.keio.ac.jp/en/activity/consortium.html>

Returning Research Achievements to Society

SFC Forum

The SFC Forum provides a setting where business leaders and university staff can engage in discussions that generate and reevaluate the knowledge required by the current age. Its purpose is to give people living in today's dramatically changing society a forum at the university—a place where they can share a wealth of ideas and broad perspectives in order to anticipate issues and build a vision for the future. Specifically, on a monthly basis the Forum holds luncheons at which innovative SFC research is introduced, management seminars with member-led discussions, etc. Additionally, it offers Research Conferences for joint and commissioned projects in the pre-launch stage so that members can exchange ideas with SFC researchers in their field of interest.

<http://sfc-forum.sfc.keio.ac.jp/>

Keio SFC-DNP Seminar

The Keio SFC-DNP Seminar is a collaborative project with Dai Nippon Printing Co., Ltd. (DNP) which was organized through a research conference offered at the SFC Forum. From the view - points of social assumptions and technology, the seminar seeks the future vision toward the realization of "the emergent society" produced by changes in diversification of information communications. In FY2006, we published the mid-term results of our planned three-year research as a book, discussing the meaning and possibility of "the emergent society".

<http://www.kri.sfc.keio.ac.jp/ja/collaboration/sfc-dnp.html>

Case Studies

Community Collaboration Laboratory

Representative: Moriyuki Oe (Professor, Faculty of Policy Management)

From SFC: Web-based Social Survey Report Laboratory

Representative: Masahiro Fukaya (Professor, Faculty of Policy Management)

In order to further increase the breadth and depth of policy management research obtained through the MEXT, 21st Century COE program, "Policy Innovation Initiative: Human Security Research in Japan and Asia", we are undertaking activities in two laboratories

The first of these, Community Collaborator Laboratory, aims to be a place for related parties (citizens, NPOs, administrations, companies, organizations, etc.) to cooperate in creating solutions for societal problems for which administrative or marketplace solutions are difficult, from the perspective of improving the ability of the related parties to resolve the problem themselves. As well, From SFC: Web-based Social Survey Report Laboratory, conducts research into communication schemes related to discovery and resolution of problems related to societal, political and economic matters.

Referenced Code Development for IMS/SIP system

Representative: Jun Murai (Professor, Faculty of Environment and Information Studies)

The range of applied fields covered by the next-generation Internet environment is becoming extremely broad. Related to this, it is becoming more important to be able to present and share the information and knowledge distributed over the Internet to users with a user interface that is intuitive and easy to use. A goal of this project is to establish the technology that will make this possible. Through this, not only will users reap large benefits from the rapid improvement in usability of so-called end-user-oriented network services, but we believe it will greatly influence the increase in number of users. It is also expected to help the network itself permeate society more widely.

Venture Incubation

Keio University is expanding incubation facilities (Keio Fujisawa Innovation Village) for entrepreneurs in joint cooperation with the Organization for Small & Medium Enterprises and Regional Innovation (SMRJ), Kanagawa Prefecture and Fujisawa City.

These facilities are offered for rent at reasonable rates to entrepreneurs who utilize SFC knowledge and information in fields such as IT, biotechnology, environment-conscious technology, nursing and health care, health management, city design, and social system design, and desire to begin a start-up business in alliance with Keio. After the initial public offering in November, 2005, seven new start-up businesses were created. However, as of April, 2007, none of these organizations had yet cleared certain conditions and become established independently, so a number of incubation managers will continue to be available to assist with advice and matching their activities with business needs.



Keio Fujisawa Innovation Village



Research Centers

Shin-Kawasaki Town Campus

Open and Cutting-edge Research Facility Pursuing Industry-Government-Academia Collaboration for Regional Development

For Inquiries:

Shin-Kawasaki Town Campus
Shin-Kawasaki Frontier Research and Education Collaborative Square
 144-8 Ogura, Saiwai-ku, Kawasaki-shi, Kanagawa,
 212-0054 Japan
 TEL: +81-44-580-1580 FAX: +81-44-580-1570
 E-mail: k2-tc@adst.keio.ac.jp
 http://www.k2.keio.ac.jp/

The Shin-Kawasaki Town Campus, popularly known as the K² Town Campus, was established in the spring of 2000 as a facility responsible for cutting-edge joint research among industry, government, and academia through collaboration and cooperation with the city of Kawasaki. K² ("K Square") represents the double meaning of (1) Keio (one "K") and Kawasaki (another "K") teaming up and thereby producing a squared effect by joining forces, and (2) the campus square (plaza). This is where the Shin-Kawasaki Frontier Research and the Education Collaborative Square were established as a frontier research organization within Keio University.

This roughly two-hectare site surrounded by greenery houses four two-story research buildings and one welfare building where a total of approximately 350 (as of March 2007) researchers including graduate students, joint researchers, and others work day and night to advance research.

In FY 2006, 13 representative Keio University frontier research projects rooted in industry-government-academia collaboration were carried out. In addition to using frontier research to enhance the technologies of local businesses and cultivate local industry through the generation of new industries, the K² Town Campus also held open seminars (three seminars were held in FY2006), on open campus day, and other events that serve to make city residents and young people aware of numerous types of learning centered on science and technology.

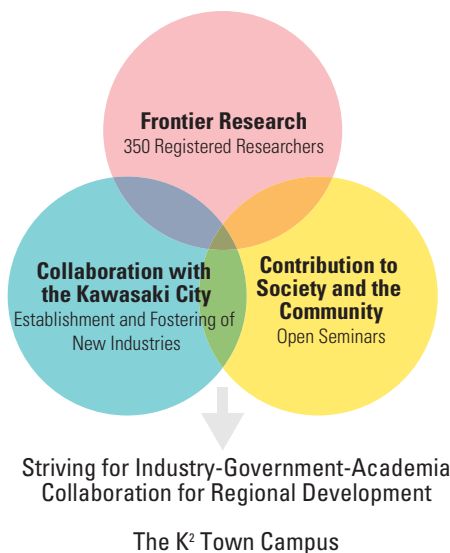
Toward Industry-Government-Academia Collaboration for Regional Development

The Shin-Kawasaki Frontier Research and Education Collaborative Square is a center which aims for not only industry-government-academia collaboration, but also collaboration with the local community. It leads to the vitalization of the local community by transmitting its research achievements to the world at large, as well as by cultivating new industries and contributing the human resources to support them.

Moreover, Keio University is also participating in the establishment of the Kawasaki Innovation Liaison Council for the purpose of building a network for industry-government-academia collaboration, advancing innovation within the community, and supporting the founding of new business and fostering of entrepreneurs.

It also aims to make global contributions to research activities from a comprehensive perspective that includes research centers outside of Japan.

The K² Town Campus will continue to work as an advanced center for collaboration with a focus on Keio University and Kawasaki City, which contributes to opening up new possibilities for the future.



Frontier Research Projects

13 frontier research projects rooted in industry-government-academia collaboration were carried out across faculties and research courses, with a staff of over 350 researchers (including full-time teachers, joint researchers, and graduate students) working day and night to advance research.

Contributing to Society through Frontier Research

The campus functions as a center for industry-government-academia collaboration by using intellectual property and research on cutting-edge technology in order to enhance technologies for local businesses, as well as to create and foster new industries.

Contributing to Society through Science Education and Awareness Campaigns

Under the cooperation of each frontier research project, various seminars are held in order to inform residents and young people of the numerous types of learning centered on science and technology.

Research Projects * Completed in FY2006 ** New Project starting in FY2007

K-Building	Project on Flexible Network for Hard-real-time and Hard-real-world System Kouhei Ohnishi (Professor, Faculty of Science and Technology)*
K-Building	Genome-based Drug Discovery Project Masaya Imoto (Professor, Faculty of Science and Technology)
K-Building	Technology of Air Cleaning for Creating the Comforts of Life Shigeru Tanaka (Professor, Faculty of Science and Technology)
K-Building	Experimental Research Project on Autonomous, Distributed, Cooperative Control by Space and Outdoor Robots Kazuo Yoshida (Professor, Faculty of Science and Technology)
K-Building	Project on Developing High Reliability of Devices with Mechanical Contacts Koichiro Sawa (Professor, Faculty of Science and Technology)* Toshiyuki Murakami (Professor, Faculty of Science and Technology)**
K-Building	Visible Light Communication Project Shinichiro Haruyama (Visiting Professor, Faculty of Science and Technology)* Yoshinori Matsumoto (Associate Professor, Faculty of Science and Technology)**
K-Building	Distributed Real-time Processing Project Nobuyuki Yamasaki (Associate Professor, Faculty of Science and Technology)
K-Building	NEDO Device Development Project for Next Generation Robot Motion Control Nobuyuki Yamasaki (Associate Professor, Faculty of Science and Technology)

K-Building	CREST 3D Display into Space Project Hideo Saito (Professor, Faculty of Science and Technology)**
E-Building	ERATO-SORST Koike Photonics Polymer Project Yasuhiro Koike (Professor, Faculty of Science and Technology)
I-Building	Beyond the Human Genome Project Nobuyoshi Shimizu (Professor, School of Medicine)*
I-Building	High-Level Global Cooperation for Leading-Edge Platform on Access Spaces Kouhei Ohnishi (Professor, Faculty of Science and Technology)**
O-Building	Future Vehicle Project Hiroshi Shimizu (Professor, Faculty of Environment and Information Studies)
O-Building	Next Generation Nano-technology Thin Film Project Seimei Shiratori (Associate Professor, Faculty of Science and Technology)
O-Building	The WIDE Project Jun Murai (Professor, Faculty of Environmental Information)
O-Building	Co-Mobility Society Creation Project Yuichiro Anzai (President, Keio University)**



One day, on campus



FY2006 Open Campus (13 Project Exhibits) November 18, 2006 (Saturday) 10:00-16:00

The Open Campus began with greetings from the Yuichiro Anzai, President of Keio University, and Takao Abe, the mayor of Kawasaki City, and was attended by many residents, students, and individuals from businesses, among others. On the same day, President Anzai and Mayor Abe conducted a passionate discussion on the active promotion of collaborations between the university and the City with regard to the future of Shin-Kawasaki Town Campus.

FY2006 Open Seminars

Comments from President Yuichiro Anzai



DD/MM/YY	Instructor	Topic
18/11/06	Professor Keisuke Shimizu, Professor Nobuyoshi Shimizu, Professor Shigeru Tanaka, Professor Masaya Imoto, Associate Professor Seimei Shiratori	K ² -based University Venture (I) —Research and New Enterprise—
18/11/06	Professor Hiroshi Shimizu	Next-generation Electric Vehicles: Development and Outlook
20/01/07	Professor Keisuke Shimizu, Professor Nobuyoshi Shimizu, Professor Shigeru Tanaka, Associate Professor Seimei Shiratori	K ² -based University Venture (II) —Research and Corporate Activities—



Kawasaki Mayor Takao Abe tours the laboratories

Various seminars related to numerous different types of learning centered on science and technology are organized to enlighten residents, young people, and individuals from the business world. In FY2006, a total of three open seminars were held that were attended by many participants. Additionally, numerous seminars are also planned for FY2007.

The K² Corner Starts on Kawasaki FM

From January 2005, the Shin-Kawasaki Town Campus (K² Town Campus) is being presented on radio by Kawasaki FM 79.1. Once every month (Tuesday) a researcher of the K² Town Campus appears at the studio and introduces frontier research that is currently being advanced. (Positions noted below are positions at the time of the broadcast.)

DD/MM	Instructor	Content
2005		
18/01	Professor Yasuhiro Koike	Plastic Optical Fiber and Broadband Society
15/02	Professor Masao Nakagawa	Progress in Mobile Phones and Visible Optical Communication
15/03	Professor Hiroshi Shimizu	Vehicles in the Near Future
19/04	Professor Kouhei Ohnishi	Evolving Robot: From Grasping to Touching
17/05	Associate Professor Seimei Shiratori	Nano Technology Changes Our Life
21/06	Professor Nobuyoshi Shimizu	The Forefront of Genome Research
19/07	Professor Shigeru Tanaka	Simple and Convenient Scrubber can Eliminate Indoor Contaminants
16/08	Chief Administrator Eiji Tomizawa	Information about This Year's Open Campus and Open Seminars
20/09	Professor Masato Nakajima	For the Graying Society: Putting K ² 's Research into Action
18/10	Vice-President Jun Murai	Toward Industry-Government-Academia Collaboration for Regional Development
15/11	Associate Professor Nobuyuki Yamasaki	Developing Necessary Real-time Processing Devices for Next-Generation Robots
20/12	Visiting Professor Shinichiro Haruyama	Communicating with Visible Light: New Illumination Techniques for Transmitting Information
2006		
17/01	Chief Administrator Eiji Tomizawa	A Review of 2005 and Resolutions and Hoping for 2006
21/02	Visiting Lecturer Akihiro Tagaya	Developing Indispensable High-Precision, Low-Cost LCD Displays
21/03	Associate Professor Manabu Omae	The Progress of Automotive Technology
18/04	Professor Masaya Imoto	Development of Therapeutic Drugs Using Human Genomic Information as the Base
16/05	Chief Administrator Eiji Tomizawa	Introducing a new project and Schedule of the Coming Year
20/06	Professor Koichiro Sawa	Research to Improve the Reliability of Switches
2007		
12/06	Chief Administrator Eiji Tomizawa	The Present and Future of K ²
17/07	Professor Hideo Saito	3D Displays into Space Using Laser Plasma Light

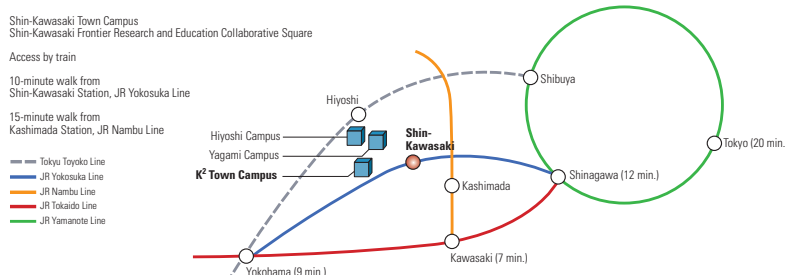
Kanagawa Shimbun

The column "Campus NOW" in the newspaper Kanagawa Shimbun posts hot topics about the Shin-Kawasaki Town Campus (K² Town Campus), about every other month.

DD/MM/YY	Topic
27/04/04	Advancing Industry-Government-Academia Collaboration for Regional Development
06/07/04	Exchanges at Open Seminars
31/08/04	Familiarizing Oneself with the Sites of Cutting-Edge Research
02/11/04	Finding out about Cutting-Edge Research through Stamps
01/03/05	Ride on the FM for Cutting-Edge Research
26/04/05	Changing Lives with Cutting-Edge Technologies
21/06/05	Commercializing Cutting-Edge Technologies
23/08/05	Learn about the Cutting-Edge Technologies at Open Lectures
01/11/05	Touch and See the World of Tomorrow
27/12/05	The Green Campus
28/02/06	The Sparkling Eyes of Children
25/04/06	Research Announcements You've Been Waiting For
20/06/06	How about A Simulated Walk through the "Street of Dreams"?
22/08/06	Reluctant to take even a Moment to Rest in Midsummer
31/10/06	A Day to Touch the Future
26/12/06	A Year for Deepening Collaborations with the Community
23/02/07	The Campus in Silence K ² Continues to Evolve
20/04/07	K ² Continues to Evolve
22/06/07	Research Begins... and Results are Passed On



Guests of K inspecting various research projects



Visiting Guests

The Shin-Kawasaki Town Campus (K² Town Campus), keeping foremost in mind collaboration between industry, government, and academia, supports visits by businesses, organizations, and media to showcase its leading-edge research being pursued daily.

Principal Guests in FY2006

- Liberal Democratic Party, "Committee for investigating the promotion of a Nation established on the platform of scientific and technological creativity"
- Chiken Kakazu; Vice-Minister in charge of Science and Technology
- Schools of Advanced Professional Technologies in Kanagawa Prefecture; Principals' Association
- Kanagawa Prefectural Yokosuka High School
- Tsinghua Science Park
- Haruo Shimada; Kawasaki City Municipal Policy Advisor

Media Coverage

During 2006, the K² Town Campus was introduced on various TV programs, including NHK's "Good Morning Japan," TV Tokyo's "World Business Satellite," and TBS News, and was the subject of a total of 104 reports in newspapers and other printed media.

Tsuruoka Town Campus



Research Centers

Tsuruoka Town Campus

K-FRECS: Keio Frontier Research & Education Collaborative Square

For Inquiries:

Tsuruoka Town Campus

Keio Frontier Research & Education Collaborative Square (K-FRECS) at Tsuruoka

14-1 Baba-cho, Tsuruoka-shi, Yamagata, 997-0035 Japan

TEL: +81-235-29-0800 (Main)

FAX: +81-235-29-0809

E-mail: office@ttck.keio.ac.jp

<http://www.iab.keio.ac.jp/>

In April 2001, Keio University established the Tsuruoka Town Campus of Keio (TTCK) in Tsuruoka City, Yamagata Prefecture, with the cooperation of Yamagata Prefecture and the municipalities of the Shonai region. The cornerstone of the campus is the Institute for Advanced Biosciences (IAB).

Research at IAB is conducted at two facilities: the Center Building and the Bio-lab.

TTCK conducts, closely and jointly with the other campuses of Keio, research and development in advanced areas and enhances research and educational activities. It proactively transfers newly created technologies to local governments and businesses to encourage industry-government-academia collaboration, for contributing to regional development as well as to the advancement of science and technology in Japan.



Bio-lab

Institute for Advanced Biosciences (IAB)

The Institute for Advanced Biosciences (IAB) is a full-fledged laboratory for bioresearch set up at the TTCK in April 2001. The IAB, using the leading-edge biotechnology, comprehensively measures and analyzes the cellular activities of organisms and microbes, simulates various cell functions and activities by computer, and applies its findings to areas such as medical care and food fermentation.

The IAB attracts attention of the world as a pioneer of "integrated systems biology," a new IT-driven bioscience.

<http://www.iab.keio.ac.jp/>

Major Research Projects

Ministry of Education, Culture, Sports, Science and Technology (MEXT)

"Development and Application of Computer-based Biosimulation Assisted by Metabolome Analyses" (2003-2007)

21st Century COE Program

Global COE for Human Metabolomic Systems Biology (Period: 2007-2011)

Ministry of Health, Labour and Welfare

Health and Labour Science Research Grants

Research on Risk of Chemical Substances: "Research related to the development of methods for evaluating the harmfulness of chemical substances using metabolome analysis and biomarkers" (Period: 2007)

Health and Labour Science Research Grants

Third Term Comprehensive Control Research for Cancer

"Research related to the construction of multidisciplinary treatment algorithms targeting primary breast cancer based on the introduction of biomarkers, and to the formulation of decision-making processes" (Period: 2007)

Ministry of Health, Labour and Welfare (MHLW), Grant-in-Aid for Cancer Research

"Research on Development of New Medical Treatment Based on Cancer Biology: Cancer metabolomes" (2005-2007)

New Energy and Industrial Technology Development Organization (NEDO)

Functional RNA Project

"Analysis of the functions of functional RNA" (Period: 2005-2009)

Japan Science and Technology Agency

Basic Research Programs (CREST)

"Modeling and Construction of Simulation Environments for Systems Biology" (2004-2008)

Basic Research Programs (PRESTO)

"Development of ultramicro-electrospray ionization approaches for -omics research" (Period: 2006-2007)

Bioinformatics Operations

"Development of Metabolome MS Spectral Integration Database" (2006-2010)

Comprehensive Support Programs for Creation of Regional Innovation

Research for Promoting Technological Seeds

"Studying culture conditions related to higher production efficiency of fatty acid derivatives for biofuels using new green algae" (Period: 2007)

Yamagata Prefecture and Tsuruoka City

"Development of Fundamental Technologies Using Systems Biology (Simulations Software Techniques, Metabolome Analysis Techniques, Genome Design Analysis Techniques, Proteome Analysis Techniques) and Their Applications (Medical, Food, and Environment)" (2006-2010)

Research System

Major Joint Research Organizations

The Faculty of Science and Technology, the School of Medicine, Shonan Fujisawa Campus, RIKEN, and Human Metabolome Technologies, Inc.

Educational Activities

The IAB develops and deploys educational activities for students with different majors in undergraduate or graduate school of Keio University, under the ideal that advanced research and education should be inseparable. In FY2006, 34 students in the spring semester and 37 students in the fall semester participated in the programs and activities offered at TTCK.

Bio Camp

The Bio Camp is a program for students of the Shonan Fujisawa Campus (SFC) at Keio to spend two semesters (or one semester) at the TTCK and experience the basics of biotechnology. The program begins with an introduction to the handling of laboratory instruments because the students have no experience with experiments. Each student extracts his/her own DNA and analyzes the gene for alcohol-degrading enzymes, and self-diagnoses through genetic testing whether his/her level of tolerance for alcohol is high or low. At the end, the students decode the genome sequences through state-of-the-art DNA sequencers

Advanced Biosciences Program

The Bioinformatics Program is a rare graduate program in the world in the sense that students can earn credits using the abundant research resources of both the SFC (bioinformatics) and IAB (systems biology). At the TTCK, a number of experiments and laboratory trainings are provided, such as "metabolome analysis" and "proteome analysis," using the most advanced DNA sequencers, bioreactors, and CE/MS equipment.

Events

Introduction to Bioscience for Tsuruoka Citizens

The introductory bioscience course for general public and taught by researchers of the IAB. There were 96 participants in FY2006.

Summer Bio College

This is a basic hands-on program in biotechnology aimed at high school students in Tsuruoka City, Yamagata Prefecture, and those in the Keio's affiliated high schools. There were 20 participants in FY2006.

Keio Summer Bio Camp

This is a basic hands-on program in biotechnology aimed at high school students in Tsuruoka City, Yamagata Prefecture, and those in the Keio's affiliated high schools. There were 20 participants in FY2006.

Spring Science Camp

This is a basic hands-on program in biotechnology for any high school students from all over Japan. In FY 2005, 16 students participated.

Other Related Facilities

Tsuruoka Metabolome Campus is a research facility located in Tsuruoka City aimed at cluster formation of bioresearch and development, with IAB as its cornerstone. HMT moved into the facility in 2005, and in 2006 RIKEN, Kirin Brewery Co., Ltd. and Nishikawa Keisoku Co., Ltd. moved in and started up their activities. Now, IAB's Metabolome group is also on the campus conducting research.

Overall View of Tsuruoka Metabolome Campus



Metabolome Group Research Facility in Tsuruoka Metabolome Campus

Commercialization

A Bio-venture Company from Keio University Human Metabolome Technologies, Inc. (HMT)

<http://humanmetabolome.com/>

Human Metabolome Technologies, Inc. (HMT) is a venture company established in July 2003 by professor Masaru Tomita, associate professor Tomoyoshi Soga, and others from the IAB, based on the IAB's measurement and analysis technology for metabolomes. HMT conducts R&D aimed at industrial applications in medical care, drug discovery, food fermentation, etc. In October 2003, HMT became the first company to be invested by the Entrepreneur Assistance Fund of Keio University. The company began joint research with Mizkan Group Co. Ltd. in January 2004, Ajinomoto Co., Inc. in June 2004, Mitsubishi Pharma Corporation in February 2005, and Chugai Pharmaceutical Co., Ltd. in September 2005. HMT is headquartered at the Tsuruoka Metabolome Campus.



High-throughput and quantitative CE-MS methods which can measure thousands of charged metabolites. This is a powerful new research device developed by IAB.



Major Awards

November 2001
"Yamagata Keizai Doyukai (Association of Corporate Executives) Grand Prize, Yamagata Landscape Design Award"

June 2003
"Nihon Kogyo Shimbunsha Award in the 17th Dokusousei wo Kirihiraku Sentan Gijutu Taishou (Leading-edge Technology for Originality and Creativity)"

November 2003
"IBM Shared University Research Award"

June 2004
"Industry-Academia-Government Collaborative Distinguished Service Commendation (Award of the Minister of State for Science and Technology Policy)"

April 2005
"First Prize in the 5th Japan Biotechnology Business Competition"

April 2007
"Prize for Science and Technology in the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science, and Technology"



Research Institute for Digital Media and Content (DMC)

Research Centers

Research Institute for Digital Media and Content (DMC Institute)

The "Encouraging Development of Strategic Research Centers" of the Special Coordination Fund for the Promotion of Science and Technology, MEXT

For Inquiries:

DMC Institute
 c/o KEIO University
 2F, West Annex, 2-17-22 Mita, Minato-ku, Tokyo
 108-0073 Japan
 TEL : +81-03-5418-6432 FAX : +81-03-5418-6437
 E-mail : info@dmc.keio.ac.jp
 http://www.dmc.keio.ac.jp/en

The Research Institute for Digital Media and Content (DMC Institute), established in 2004, promotes international research and collaboration under a project-based contract system. This project system focuses its research on contextual digital content from various perspectives such as content design, media technology, intellectual property management, and industry-related policy. The Institute established Global Studios as international research centers at Tsinghua University in China and Yonsei University in South Korea in 2005, and in Cambridge in the UK and in New York in the United States in 2006. The Institute also makes efforts to transmit the results of research on an international scale, for example through international symposiums held at these Global Studios. Past symposiums include "Global Sharing of Wisdom in the Digital Communication Era," in March 2006, and "Convergence: Towards A New Paradigm for Creative Society," in August 2006.



Studio at Yonsei University



Studio at Tsinghua University



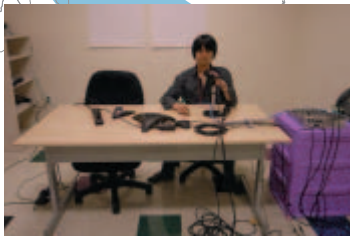
Studio at the University of Cambridge

The studios are:

- Facilities for high-quality digital video & audio communication
- Hubs located in key places of digital content development
- Centers shared by research communities with diverse academic backgrounds
- Part of a global digital network connected by a standardized communication system



Studio at Keio University



Studio in San Francisco



Studio in New York

Project List

Special Projects: Under the strong leadership of the institute director, the DMC Institute supports three special projects.
DMC System OCW e-Learning

Task Force: The Task Force oversees all research projects and handles specific issues related to personnel and the DMC Lab.
Communication Strategy Human Resource Development

DMC Lab: Five Research Areas

Content Creation

- Art Ensemble Digitization
- Resources of Butoh Body Movements
- Sound Education
- Musical Source Digitization
- 3D Digital Media Capturing and Presentation
- Post Encyclopedia

Content Digitalization & Distribution

- Post-Encyclopaedism
- Creation of a Remote Collaboration System and State-of-the-Art Digital Content
- Medical Education Digitalization
- Re-creation and Archive of 40s Mining Town Using Advanced 3D Computer Graphic Technology
- Historical Image Database of Yukichi Fukuzawa at Keio University

Media Environment

- Digital Cinema LyKEIO Project
- Digital Archives for Architectural Space Project
- Digital Archive System
- Research on Ubiquitous Media Infrastructure Technologies and Applications
- Barter Currency Project
- Content Cruising System
- Next Generation Application Development

Intellectual Property Management

- Digital Intellectual Property Project
- Project for Developing Education Programs for Strategic Standardization

Content Industry & Policy

- Content Industries & Policy Research Project

Main events held in 2006

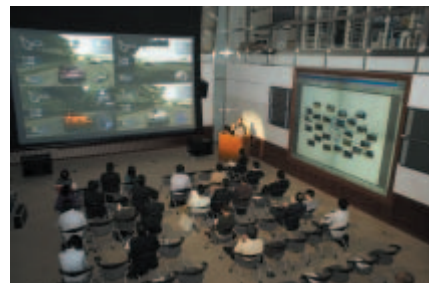
April 25, 2006	Creative Industries Policy Forum "Media Convergence Policy: the Next Step."
June 13, 2006	Creative Industries Policy Forum "Content Policy in the Age of Media Convergence."
July 3, 2006	Art Ensemble Digitization Project Workshop, "The Blindfolded String Quartet Workshop."
July 14, 2006	First 4K Applications Workshop: "Bringing World Heritage Sites to Life with 4K Technology."
July 15, 2006	International Workshop: featuring Adam Greenfield and his recently published <i>Everyware: The Dawning Age of Ubiquitous Computing</i> (Indianapolis: New Riders, 2006).
August 28/29, 2006	The 5th International DMC Symposium: "Convergence: Towards A New Paradigm for Creative Society."
September 15, 2006	Second 4K Applications Workshop: "Showing 300-inch Digital Pictures Using 4K Technology."
October 23, 2006	An experimental multi-point live transmission of "Ridge Racer 7" motion pictures at "Digital TIFF Symposium" during the Tokyo International Film Festival.
December 2-16, 2006	Art Ensemble Digitization Project: "Our Important Things: Art Workshop featuring Otaka Miyuki."
December 15, 2006	Envisioning the future of film making...reflecting of the 7th Tokyo FILMeX
December 16, 2006	Digital Communication Tools in the Perspective of Socio-Media Studies Project: Workshop: "News Now: The Case of the Standing Lesser Panda, 'Fuuta.'"
February 19, 2007	Lecture: Professor Ulrich Weinberg (Hochschule für Film und Fernsehen) "How Film Schools in Germany Prepare for the New Challenges."
March 12, 2007	The Sixth Creative Industries Policy Forum: "Why the Delay? Questioning the Way Content is Disseminated."
March 19, 2007	The Seventh Creative Industries Policy Forum: "Should We Have a Ministry of Communications? Good and Bad Ideas for Designing a Regulatory Scheme in an Era of Media Convergence."
March 20, 2007	The Eighth Creative Industries Policy Forum: "Summing Up: Talking with Regulatory Policymakers."



'Blindfolded String Quartet' Workshop



The 5th International DMC Symposium: "Convergence: Towards A New Paradigm for Creative Society."



Tokyo International Film Festival event "Digital TIFF Symposium"

Steering Committee

Yuichiro Anzai
Jun Murai
Masahiko Inakage
Motoaki Ibane
Junko Iwabuchi
Sadayasu Ono
Hideyuki Tokuda
Susumu Furukawa
Jungmoon Kim
Kenji Saito

Researchers, Specialists
Collaborators within Keio,
Part-time, RAs
Total: 123 persons



Promoting Research Collaboration and Transmission to Society: Activities at the Center for Research Promotion

In order to most effectively utilize the broad-ranging research capabilities of Keio University, the Center for Research Promotion has established a Research Grants Program to promote "Differing Fields Collaboration" within the University, and holds open symposiums to inform society of industry-academia collaboration activities. The Research Grants Program promotes the formation of joint research projects that transcend the boundaries of existing organizations or disciplines. Meanwhile, the open symposiums are important events because they provide an opportunity for general participants to learn about research at Keio University, and also act as a means of promoting broader interactions among individuals from universities and the industrial world.

1 The Center for Research Promotion's Grant Programs for Researchers

Goal of the Programs

The goal of these programs is to fully utilize the potential of Keio University as a general university to open up possibilities for the creation of new academic fields by combining advanced research in multiple and diverse fields, and at the same time to conduct research that meets the needs of the world at large, thereby supporting an expansion in opportunities to secure research funding from outside.

Recently, universities have been facing demands to dramatically expand and strengthen their research activities. In addition to fortifying fundamental research activities, a major mission of universities is to respond to global environmental issues and the dropping birthrate and aging population in Japan, and to meet the needs of the real world, such as ensuring a safer, more secure society.

The Center for Research Promotion initiated research grants for researchers within Keio University in 2005, with the goal of developing joint research projects that respond to the social needs, and of promoting research collaborations among differing fields that will act as a primer for such development. Specifically, it aims to further strengthen the research capabilities of Keio University by providing research grants for research that is expected to receive research capital from outside parties.

Outline of the Programs

In the 2006 Research Grant Program, we put out a call for research themes in two divisions: "Young and New Researchers" and "Differing Fields Collaboration."

Grant for New and Young Researchers

[Program Requirements]

- The research must be creative and offer possibilities for the future.
- The research must be expected to be eligible to apply for competitive research funding (Grants-in-Aid for Scientific Research, etc.) related to the research in the following year.

[Application requirements]

- On April 1, 2006, the applicant must have been 40 years of age or younger, or have been with Keio University for five years or less, and must be a full-time researcher, a non-tenured contract researcher, or a special researcher (if qualified to apply for external funding).

[Amount of Grants]

- The maximum shall be one million yen per grant.

Differing Fields Collaboration Grant

[Program Requirements]

- Two or more researchers must be participating from different specialized fields

- Project must be comprehensive, taking advantage of collaborations between different fields, and must be creative and offer possibilities for the future (e.g., "drug creation," "safety/security," etc.)

- The research must be expected to be eligible to apply for competitive research funding (Grants-in-Aid for Scientific Research, etc.) related to the research in the following year.

[Application requirements]

- The applicant must be a full-time researcher, a non-tenured contract researcher, or a special researcher (if qualified to apply for external funding).

[Amount of Grants]

- The maximum shall be five million yen per grant.

The researchers selected to receive grants through this Program are required to conduct the research during the year in which the grant is provided, and to present the results of that research at a research seminar held in the following year. During that presentation, they are required to outline the status of acquisition of external research funding.

During the 2006 fiscal year, there were 57 applications, of which nine were selected for the Grant for New and Young Researchers and four for the Differing Fields Collaboration Grant. Details of selected research themes are shown in the table below.

Selected Researchers and Research Subjects in 2006 (titles at time of selection)

Grant for New and Young Researchers		
Name	Affiliation/position	Subject of Research
Manabu Omae	Associate Professor, Graduate School of Media and Governance	Research on automatic in-line running of small electric vehicles
Wataru Kakegawa	Instructor, Physiology, School of Medicine	Dean and Professor, Faculty of Environment and Information Studies
Sho Kanzaki	Instructor, Otorhinolaryngology, School of Medicine	Clinical research on cytokine and stress responses in sudden deafness
Eiji Kikuchi	Instructor, Urology, School of Medicine	Enhanced chemosensitivity to CPT-11 by a novel NF-kappa B inhibitor, DHMEQ in bladder cancer
Ken-ichiro Kubo	Assistant Professor, Anatomy, School of Medicine	Clarification of pathologies in mentally ill patients using functional analysis of candidate gene DISC1
Shinji Sasaki	Instructor, Anatomy, School of Medicine	Clarification of the molecular basis of neuronal migration and formation of neuronal network in the developing cerebral neocortex
Akira Hirasawa	Instructor, Obstetrics and Gynecology, School of Medicine	Development of genetic polymorphism diagnostic tools for the prevention of hyperlipemia and osteoporosis following premenopausal ovariectomy
Shinji Makino	Instructor, Regenerative Medicine, School of Medicine (non-tenured)	Screening of cardiac regeneration genes in zebrafish & Medaka
Taisuke Mori	Instructor, Pathology, School of Medicine	Clarification of liver cancer mechanisms in solid cancers in cancer/stem-cell-related gene Bmi1
Differing Fields Collaboration Fund (● indicates research representative)		
Name	Affiliation/position	Subject of Research
●Kosaki Kenjiro	Associate Professor, Pediatrics, School of Medicine	Strategic development of genetic diagnosis using microreactor technologies
Norihisa Miki	Assistant Professor, Department of Mechanical Engineering, Faculty of Science and Technology	
Miki Akiyama	Senior Assistant Professor (Non-tenured) (Part-time), Graduate School of Media and Governance	Research related to information platforms for cancer treatment information provision
Yasushi Kiyoki	Professor, Faculty of Environment and Information Studies	
Yuko Takada	Professor, Faculty of Nursing and Medical Care	
●Masaru Tomita	Dean and Professor, Faculty of Environment and Information Studies	
Shoko Miyagawa	Assistant Professor, Faculty of Nursing and Medical Care	Analysis of a dimeric transcription factor network
Kumar Selvarajoo	Research Assistant, Graduate School of Media and Governance	
Yasunari Takada	Instructor, Microbiology/Immunology, School of Medicine	
Seiji Tateyama	Special Research Assistant, Graduate School of Science and Technology	Research in effect mechanisms of general anesthetics from the perspective of water molecule nano-environments
Kenichi Horisawa	Special Research Assistant, Graduate School of Science and Technology	
●Koichi Matsuo	Associate Professor, Microbiology/Immunology, School of Medicine	
Hiroshi Yanagawa	Professor, Department of Biosciences and Infomatics, Faculty of Science and Technology	
●Masato Yasui	Professor, Pharmacology, School of Medicine	Research in effect mechanisms of general anesthetics from the perspective of water molecule nano-environments
Kenji Yasuoka	Associate Professor, Department of Mechanical Engineering, Faculty of Science and Technology	

2 Transmission of Research Activities to Society

The Center for Research Promotion conducts public symposiums twice each year at the Mita Campus as part of activities aimed at showing a broader segment of society the day-to-day research activities undertaken at the University in a multi-faceted, three-dimensional format. "Collaboration" is a key word for a unique feature of the symposiums held at the Center for Research Promotion. The Center is planning programs that will provide opportunities for meetings between "fields," or meetings between the "University" and "Society," based on themes presented in the symposiums. Symposium activities would include, for example, approaches to common issues in medicine

and engineering from separate research fields, discussions between University researchers and invited guests from industries closely related to the themes in question, or exhibits displaying the results of joint research conducted by companies and the University.

The symposium held in February 2007, entitled "Aiming for rapid medical applications of basic research in life sciences," was based on the theme of "Translational Research"; that is, where the results of fundamental research are quickly applied to the front lines of medicine, and where knowledge obtained from clinical cases is in turn applied to fundamental research. There

were lectures and panel discussions on what should be done by government, companies, and universities to establish the roots of translational research in Japan, and the participants shared a new awareness regarding the urgency of fostering researchers with a broad knowledge base and perspective with respect to front-line clinical work, medicine, and engineering. The symposium welcomed about 220 participants, ranging from specialists representing companies and universities to high school students and other members of the general public, all of them could be seen listening intently and taking detailed notes.



Participants listening to a lecture



Panel Discussion

In July 2007, Keio University held a Joint Symposium with NTT Corp. entitled "Ubiquitous Leadership" - The future of Industry-Academia Collaborations. Keio University and NTT Corp. has been conducting research activities through industry-academia collaborations in the telecommunications field based on a comprehensive collaboration contract completed in March 2006. The symposium, which focused on the themes of

February 2007 Keio University Advanced Science and Technology Symposium: "Aiming for rapid medical applications of basic research in life sciences"

Opening comments	Yuichiro Anzai (President, Keio University)
Suppression of cancer and diabetes by cellular signal transduction inhibitors	Kazuo Umezawa (Professor, Keio University, Department of Applied Chemistry, Faculty of Science and Technology)
Medical applications of molecular dynamic simulations	Masato Yasui (Professor, Keio University, School of Medicine, Department of Pharmacology)
The minimum invasive therapy system using laser radiation	Tsunenori Arai (Professor, Keio University, Department of Applied Physics and Physico-Informatics, Faculty of Science and Technology)
Bioengineering that protects blood vessels	Kazuo Tanishita (Professor, Keio University, Department of System Design Engineering, Faculty of Science and Technology)
Development and applications of high-functioning nano-magnetic beads	Hiroshi Handa (Professor, Tokyo Institute of Technology, Graduate School of Bioscience and Biotechnology)
Application of human medicine platform and metabolomics for preclinical biomedical researches	Makoto Suematsu (Professor, Department of Biochemistry & Integrative Medical Biology, School of Medicine, Keio University)
Roles and challenges of biology statistics in clinical tests and clinical research	Masahiro Takeuchi (Professor, Kitasato University, School of Pharmaceutical Sciences, Director of the Kitasato Center for Clinical Pharmacology)
Current status in new drug development and clinical research and establishment of the Center for Clinical Research in Keio University	Yasuo Ikeda (Dean, Keio University, School of Medicine; Professor, Department of Internal Medicine, School of Medicine)
Panel Discussion	Toru Takebayashi (M.C.) (Professor, Keio University, School of Medicine, Department of Preventive Medicine and Public Health)
Issues for increasing speed: From a Human Resource Development Perspective	Kazuhiro Araki (Ministry of Health, Labour and Welfare, Health Policy Bureau, Research and Development Division)
	Masahiro Takeuchi (Professor, Kitasato University, School of Pharmaceutical Sciences, Director of the Kitasato Center for Clinical Pharmacology)
	Kazuhiisa Yanagisawa (Executive Officer, Olympus Corp.)
	Kazuo Tanishita (Professor, Keio University, Department of System Design Engineering, Faculty of Science and Technology)
	Yasuo Ikeda (Dean, Keio University, School of Medicine; Professor, Department of Internal Medicine, School of Medicine)

M.C.: Prof. Junji Yoshihara (Director, Keio University Center for Research Promotion)

"Ubiquitous Society" and "Industry-academia collaborations," included lectures, dialogues, and panel discussions regarding actual cases of research and development and applications of telecommunications technologies that will serve to make our lifestyles more convenient, and to resolve a wide range of problems being faced by society, as well as specific approaches to research collaboration between universities and

companies. They were also presentations on the results of research carried out through such industry-academia collaborations. Display booths were also set up within the venue, to introduce elements of research through demonstrations and posters. On the day of the symposium, they were more than 1000 visitors, including persons affiliated with companies, universities, and government agencies.



Discussion. Heizo Takenaka, Director, Keio University Global Security Research Institute, and Jiro Kokuryo, Professor, Faculty of Policy Management



Display Booths

July 2007 Keio University/NTT Joint Symposium: "Ubiquitous Leadership" - The future of Industry-Academia Collaborations

Opening Speech	"Research Collaboration on Global Information Society"	Jun Murai (Vice President, Keio University)
Opening comments	"Leadership in the Future through Industry-Academia Collaborations"	Yuichiro Anzai (President, Keio University)
	"Expectations for Industry-Academia Collaborations"	Noritaka Uji (Vice-President, NTT Corp.)
Part 1:	"Contributing to the Ubiquitous Society"	
	Discussion "The Goal of Ubiquitous Policies"	Heizo Takenaka (Director, Keio University Global Security Research Institute, Former Minister of Internal Affairs and Communications)
		Jiro Kokuryo (Professor, Faculty of Policy Management; Director, Incubation Center)
Part 2	"Advanced Research in Ubiquitous Applications"	
	(Coordinator)	Hideyuki Tokuda (Professor, Keio University, Faculty of Environment and Information Studies, Chairperson, Graduate School of Media and Governance)
	(Presentations) Joint Researchers at Keio and NTT	<ul style="list-style-type: none"> Location Future Project: The Future of Mobile Solutions Low-speed Ubiquitous Wireless Networks: The Future of Visual Light Communication Technologies HF Band semi-passive Tags: The Future of Active RFID Technologies Ubiquitous Information Distribution Platform Software: The Future of Sensor Network Platform Technologies
Part 3	"Designing Ubiquitous Societies"	
	Presentation: "Media Design Innovations that Support Creative Societies"	Masahiko Inakage (Professor, Keio University, Faculty of Environment and Information Studies)
Part 4	"Promoting Industry-Academia Collaboration Models that Open up the Future"	
	Presentation: "From Broadband to Ubiquitous Innovations: The Paths and Future of Collaboration between Keio University and NTT Laboratories"	Akira Nambu (Director, NTT Cyber Communications Laboratory Group)
	Panel Discussion	Akira Nambu (Director, NTT Cyber Communications Laboratory Group)
	"New Approaches to Supporting the Information Society"	Junji Yumoto (Director, NTT Basic Research Laboratories)
		Sawako Nohara (President, IPSe Marketing, Inc.)
		Yasuhiro Koike (Professor, Keio University, Professor, Faculty of Science and Technology; Director, Keio Leading-edge Laboratory of Science and Technology)
	(Moderator and Panelist)	Jiro Kokuryo (Professor, Faculty of Policy Management; Director, Incubation Center)

MC: Minako Nagai (Freelance Announcer)

Internationalization of Research Activities at Keio University

International research interactions, for example through joint research, staff exchanges, joint symposiums, and the writing of joint papers, are increasing steadily on all levels, from projects at individual laboratories to projects at large-scale research centers, including 21st Century COE programs. Here, we will introduce some of these research activities, with a list of press conferences held by the University (excerpts) and two articles on international joint symposiums.

Research-related press conferences in Japan and overseas during 2006 (excerpts)

- * April 14, 2006: Shiseido - Keio Leading-edge Laboratory of Science and Technology (KLL) - Kickoff of Joint Industry-Academia Project on Skin Interface Science
- * May 8: Start of Video Content Distribution Platform "VOLUME ONE"; Research Institute for Digital Media and Content, Keio University
- * May 30: Completion of one of the world's top-level digital cinema screening/evaluation facilities at an educational institute: strengthening collaborations with Hollywood's international research institutes, etc.
- * June 19: Clarifying the new role of responsive astroglia in central nervous system injuries
Published in Nature Medicine, July 2006 Ed.
- * June 20: Keio University and Nozomi Photonics Co., Ltd. conduct open tests of the world's first optic slot allocation networks using Generalized Multi-Protocol Label Switching (GMPLS) next-generation optic network control method
- * July 10: Oxidation stress as a cause of aging-related illnesses: Keio University School of Medicine, Department of Ophthalmology, makes an important discovery in support of the "Free Radical Aging" hypothesis
Published in Proceedings of the National Academy of Sciences, July 10, 2006, Early Edition
- * July 13: Full-scale startup of joint research in digital content technologies involving research institutes in Hollywood and University of Southern California, etc.
- * July 18: Keio University Center for Research Promotion Symposium: "Sports as a Guide to the Future: Research and advancement in sports medicine, science, and culture"
- * August 8: Collaboration between Keio University Institute of Physical Education and Yokohama FC (Pro Soccer Team: J2)
- * August 16: Start of joint research in content digitalization involving Keio University Research Institute for Digital Media and Content and Kawasaki City Museum
- * August 23: Keio University Research Institute for Digital Media and Content Workshop and Symposium: "5th DMC International Symposium: Integration: Aiming for a Cultural Creation Society"
- * September 1: Giants of Modern Art: The first visit to Japan in 7 years: Lecture by Christo & Jeanne-Claude
- * September 14: Announcement of 11th Keio Medical Science Prize Recipients
- * September 20: 60th Anniversary Commemorative Open Course held by Keio University Institute for Media and Communications Research and Nippon Television Network Corp.
- * October 5: Ten years as a driving force behind secondary education and Internet research and development in Asia
- * October 10: Keio University Research Institute for Digital Media and Content conducts successful tests of world's first 4K Video and multi-channel audio synchronized playback: Initiatives in remote production and editing of 4K Video and high-quality digital audio
- * October 17: "Business Competition and Seminar" aiming for the creation of new business in the Keio University community; held in commemoration of Keio University's 150th Anniversary
- * October 20: Keio University verifies controls in 10ns ultra-high-speed optical switches in international interconnectivity tests in the U.S. using Generalized Multi-Protocol Label Switching (GMPLS) next-generation optic network control method
- * October 23: Keio University conducts successful tests of multi-location on-line game distribution using 4K video—Conducted at Tokyo International Film Festival Digital Tiff Symposium—
- * International Criminal Court (ICC) Symposium held in commemoration of Keio University's 150th Anniversary "The present and future of the International Criminal Court: Its meaning, record, and challenges"
- * October 26: Technical collaboration in video distribution for Tokyo FILMeX International Film Festival
- * November 10: Guided regeneration of injured spines using semaphoring 3A inhibitors
Published in Nature Medicine; on line edition
- * November 20: Development of "IP over digital broadcast" technologies for construction of IP networks in digital broadcasting
- * November 24: Keio University Global Security Research Institute (G-SEC) International Seminar: "International activities aimed at ensuring health and safety"
- * December 21: Keio University SFC 4th year student discovers large volumes of unknown amino acid "transporter" genes
- * January 26, 2007: Keio University Advanced Science and Technology Symposium
"Aiming for rapid medical applications of basic research in life sciences"
- * January 26: Keio University School of Medicine research Group: Creation of endometriosis model mice and Development of related real-time analysis systems. *Published in Proceedings of the National Academy of Science of the United States of America; February 6, 2007 Edition*
- * January 31: "Babies hear language through a handoff between circuits in the brain": First clarification of the development of language sound recognition development processes in the brain in infants
Published in The Journal of Neuroscience; Vol. 2, No.27, January 10, 2007
- * February 13: Predictions and testing of life phenomena using computer science: Results of the Keio University "Cell bio-function Simulation Project" *Published in The Journal of Biological Chemistry on line Edition; Early Edition, February 9, 2007*
- * February 20: Development of new technologies for saving data in bacteria; Keio University Institute for Advanced Biosciences et al.
- * February 21: Collaboration in network-based live broadcast of Kyoto Prize Recipients' Symposium: High-quality digital video transmissions between Tokyo and San Diego
- * March 19: Toshiba Corp. and Keio University install "PANA/Diameter" next-generation Internet authentication platform protocol jointly as part of "WIDE Project"
- * March 23: World's first quantitative verification of "Tenaciousness of Cells" *Published in Science; April 27, 2007 Edition*

10 years of Leadership in Research and Development on Internet & Applications to Higher Education in Asia AI3 Project and SOI Asia Project Symposium

11 October 2006
ITB, Bandung, Indonesia

Prof. Jun Murai, Professor of Faculty of Environmental Information at Keio University has been leading Widely Integrated Distributed Environment (WIDE) Project to contribute to the development of the Internet infrastructure and the higher education in Asia by starting the two leading projects, namely, Asian Internet Interconnection Initiatives (AI3) Project, and School on the Internet Asia (SOI Asia) Project. AI3 project aims to research and develop the Internet technologies and SOI Asia Project develops distant learning applications for the advanced usage of the Internet as a tool of higher education. SOI Asia constructed distance learning systems utilizing AI3's internet infrastructure which delivered live Internet lectures to partner institutions. In total, 24 universities and research institutions in 13 Asian countries have joined the AI3 and SOI Asia projects as of October 2006. This initiative has successfully resulted in developing human resources in the IT technology field in the Asian partner countries.

AI3 and SOI Asia have constructed a network with large dimensions and diversities of 24 partner institutions in 13 Asian countries including Myanmar and Laos. 10 years of development and deployment of Internet infrastructure in Asia by the projects can well be described as the history of the Asian IT infrastructure development, looking back to the start of the project when Internet itself was yet very undeveloped in the region. As a result of a successful human resource development and network of people in IT in Asia, engineers and staff of both projects now play the key roles of IT development in their countries. SOI Asia was among the first to support Syiah Kuala University which suffered a devastating damage of losing more than 100 faculty members by The earthquake off the west coast of Northern Sumatra and the giant Tsunami in the Indian Ocean on Dec.26, 2004. Syiah Kuala University's function recovery was strongly supported by the distance learning system of SOI Asia.

Brief Summary of the symposium

ITB, Bandung, Indonesia and Keio University Mita Campus were connected in real-time by high quality video conferencing system using Digital Video Transport System (DVTS) technology. Participants in each site enjoyed very clear audio and video. From Mita Campus, Dr. Heizo Takenaka, former Minister of Public Management, Home Affairs, Posts and Telecommunications, Prof. Yuichiro Anzai, President of Keio University and Prof. Tatsuya Sakamoto, Vice President of Keio University in International Affairs gave a congratulatory address. From ITB, Dr. Ir. Richard Mengko, Minister's Advisor for Information Technology Affairs, State Ministry of Research and Technology, Ir. Cahyana Ahmad Jayadi, Director General of Telematics Applications, Department of Communication and Information, Prof. Djoko Santoso, rector of ITB gave congratulatory address. H. E. Mr. Shin Ebihara, Ambassador Extraordinary and Plenipotentiary of Japan to the Republic of Indonesia sent his congratulations to the symposium.

At ITB, more than 120 participants from partner institutions and Indonesian local universities attended the symposium. It was also broadcasted to AI3 and SOI Asia partners. Partner institutions signed the "Bandung Declaration" to promote further collaboration and friendship. From the Mita campus, Prof. Anzai signed the declaration remotely over the Internet. At ITB, as a representative of 24 partners, Prof. Dami M. Daud, rector of Syiah Kuala University signed the declaration and gave a message that partners would continuously collaborate together.

After the Bandung Declaration signing ceremony, Prof. Jun Murai presented the AI3 award and SOI Asia award. AI3 award was given JSAT Corporation, and Mr. Hideaki Kido, director of JSAT corporation received the award representing JSAT Corporation. SOI Asia award was given to an individual- Mr. Hitoshi Shozawa, ex-chairman of Asia SEED.

Project overview was explained by Prof. Jun Murai, Chair of WIDE, AI3 and SOI Asia, vice president of Keio University, Prof. Suguru Yamaguchi, Nara Institute of Science and Technology, director general of AI3 and Prof. Keiko Okawa, Keio University, director general of SOI Asia. Researchers of the projects presented technologies and histories of AI3 and SOI Asia.

Project achievements were summarized in "Memorial Web Book" and CD-ROM of the web pages was distributed to participants. At the final part of the symposium, a panel discussion was held inviting leading researchers in ICT fields from partner institutions and Mr. Thomas Tai, Sr. Vice President of Asia Pacific, VSNL. Panelists conducted active discussion on ICT development and human resource development.

The International Symposium on the International Criminal Court (ICC) "The International Criminal Court Reviewed -Significance, Accomplishments and Challenges"

November 4, 2006
Global Security Research Institute Lab., 6F East Research Building,
Mita Campus, Keio University, Tokyo

This was the commemorative event with two ICC judges participating for the first time in Japan. In addition, experts of criminal law from Humboldt University, Berlin and Cologne University as well as Congress members from Japan joined as panelists of the symposium.

As one of the pioneers in the field of research on International Criminal Law, Keio University provides two advanced courses which focus on crime against humanity and genocide at Keio Law School, established in 2004. It also carries out cutting-edge research and encourages excellence in research and education.

There was much lively debate between participants at the workshops and panel discussions, where there was also lively exchange of opinions.

The 21st Century COE Program / Global COE Program

In the 21st Century COE (Center of Excellence) program, one of Japan's most notable competitive research grants, five research centers from Keio University were selected in 2002 and seven centers were selected in 2003, and all of these centers have continued to demonstrate outstanding results.

For example, the number of doctoral degrees granted increased dramatically from an average of about 190 per year from 1998 to 2001, before the start of the 21st Century COE program, to about 260 per year in 2002 to 2005, after the start of the program. Each of the COEs has hired numerous young researchers, including research assistants (RAs) and post doctorates, and has trained employees to undertake advanced research. They are also actively involved in developing young researchers by encouraging them to accumulate experience through the submission of papers, and by having them give presentations on research and participating in debates at academic conferences, symposiums, and other venues in Japan and overseas.

One of the unique features of COEs at Keio University is

that they promote close collaboration in education and research with outstanding universities and research institutes not only in Japan but overseas. This is demonstrated by the fact that several overseas universities and research institutes recognized as being among the best in the world have been positioned as centers for collaboration by global COEs selected in 2007.

Please refer to the following pages for details on activities being undertaken at these COEs.

Incidentally, COEs selected in 2002 have completed their five-year programs, and have entered a new phase of activities; namely, the start of the Global COE Program mentioned above. "Global COEs" are positioned as continuations of the 21st Century COE Program, and in 2007, three centers were selected as Global COEs at Keio University.

Each of these programs proposes further developments of the research and Education centers built through the 21st Century COE Program. In the

screening process, the centers were highly valued based on their record of activities in the 21st Century COE Program, research plans over the next five years based on those activities, and world-class researcher training plans with a focus on Doctoral Programs.

The three Centers selected as Global COEs have been established as key research facilities within the Keio Advanced Research Centers (KARC). KARC was established within the Organization for Research Advancement and Administration (ORAA) under the leadership of the President of Keio University in February 2007, and is a crosscutting organization that is not limited by the boundaries of Faculties and Departments, even in terms of personnel.

These Centers within KARC are expected to collaborate with the existing Graduate Schools, while growing as world-class research institutes and venues for promoting the development of outstanding researchers.

Centers selected in the 21st Century COE Program (Centers selected in 2002 based on 2006 data; Centers selected in 2003 based on 2007 data)

Page	Adopted Year	Field	Home Campus*	Center	Program Leader
P.25	2002	Humanities	Mita	Toward an Integrated Methodology for the Study of the Mind— CIRM: Centre for Integrated Research on the Mind—	Taro Nishimura, Professor, Graduate School of Letters
P.25	2003	Social Sciences	Mita	Development of a Theory of Market Quality and an Empirical Analysis Using Panel Data	Naoyuki Yoshino, Professor, Graduate School of Economics
P.26	2003	Social Sciences	Mita	Designing toward the Ordering of Political Society in a Multi-cultural and Pluri-generational World	Yoshiaki Kobayashi, Professor, Graduate School of Law
P.26	2003	Social Sciences	Shonan Fujisawa	Policy Innovation Initiative: Human Security Research in Japan and Asia	Jiro Kokuryo, Professor, Graduate School of Media and Governance
P.27	2002	Life Sciences	Yagami	Understanding and Control of Life's Functions via Systems Biology	Hiroshi Yanagawa, Professor, Graduate School of Science and Technology
P.27	2002	Chemistry, Material Sciences	Yagami	Function Creation Oriented Life-Conjugated Chemistry	Haruma Kawaguchi, Professor, Graduate School of Science and Technology
P.28	2002	Information Sciences, Electrical and Electronic Engineering	Yagami	Optical and Electronic Device Technology for Access Network	Toshiaki Makabe, Professor, Graduate School of Science and Technology
P.28	2002	Interdisciplinary, Combined Fields, New Disciplines	Shonan Fujisawa	Next Generation Media and Intelligent Social Infrastructure	Hideyuki Tokuda, Professor, Graduate School of Media and Governance
P.29	2003	Medical Sciences	Shinanomachi	Establishment of Individualized Cancer Therapy Based on Comprehensive Development of Minimally Invasive and Innovative Therapeutic Methods	Yutaka Kawakami, Professor, Graduate School of Medicine
P.29	2003	Medical Sciences	Shinanomachi	Basic Study and Clinical Application of the Human Stem Cell Biology and Immunology: Approaches Based on the Development of Experimental Animal Models	Hideyuki Okano, Professor, Graduate School of Medicine
P.30	2003	Mathematics, Physics, Earth Sciences	Yagami	Integrative Mathematical Sciences: Progress in Mathematics Motivated by Natural and Social Phenomena	Yoshiaki Maeda, Professor, Graduate School of Science and Technology
P.30	2003	Mechanical, Civil, Architectural and Other Fields of Engineering	Yagami	System Design: Paradigm Shift from Intelligence to Life	Kazuo Yoshida, Professor, Graduate School of Science and Technology

* Home Campus: Affiliate region of research representative

Global COEs Selected in 2007

Life Sciences

Global COE for Human Metabolomic Systems Biology
Makoto Suematsu; Professor, Graduate School of Medicine

The goal of the Center is to promote "Global COE for Human Metabolomic Systems Biology," which aims to reveal regulatory mechanisms of metabolism in human physiology and pathology through systems biological technology such as high-throughput metabolome and computer-assisted biosimulation, and to form a world-class interdisciplinary research and education center to foster young researchers who will create new life science research that combines different fields including medical science, computer-assisted engineering, information sciences, and pharmaceuticals.

This Center has been formed within the Center for Integrated Medical Research, and uses super immunodeficiency mice in which organized cell populations originating from humans are recreated *in vivo* to promote *in vivo* Metabolism System Biology studies under cancer tumor or parasitic infection conditions. It also actively promotes research and education activities, and collaborates with the Karolinska Institutet in Sweden, Boston University, etc. to achieve synergistic effects taking advantage of the strengths of each institution in each respective field.

As part of activities aimed at fostering young researchers, the Center encourages students to experience trips and short-term study periods at collaborating universities overseas, and conducts research activities in multiple departments, so that they who have achieved an exceptionally high level can be granted double degrees. The Center also plans to initiate a Research Incubation Program in the Faculty of Science and Technology and the Graduate School of Media and Governance for young researchers at the Post-Doctorate level to provide a venue for establishing career paths.

This Center will actively invite instructors and young researchers from collaborating Centers overseas to promote the internationalization of Graduate School education at Keio University.

Information, Electricity, Electronics

High-Level Global Cooperation for Leading-Edge Platform on Access Spaces

Kouhei Ohnishi; Professor, Graduate School of Science and Technology

There is a growing demand for new digital technologies that can accommodate individual differences in users, as opposed to technologies for use by the masses. By creating an access space that connects individuals with other individuals, society, and the environment, and controlling that access space, it will be possible to offer services and security that meets these demands. The goal of this Program is to establish these types of science and technology platforms through high-level international collaboration Centers on a global scale.

While utilizing collaborations with Harvard University, Xi'an Jiaotong University, and the Ecole Centrale de Lyon-Lyon Nanotechnology Inst., which have already been cultivated through the 21st Century COE Program, this Center will promote research with advanced synergistic effects in four fields – "Basic engineering physics for innovative photonic/electronic device creation," "Environment-embedded device technology," "Real-world and real-time network for multi-dimensional processing and communication," and "Perception and expression technology," – in order to provide advanced human support in access spaces.

Particularly in terms of fostering young researchers, the Center has expanded its international internship program and established a multiple instructor system and a double-degree system so that students can acquire adaptability and a broad range of problem-solving skills in addition to their original areas of specialty. As a result, career paths for young researchers with degrees are rooted firmly in an approach of "Producing world-leading researchers and CTOs with leadership qualities that enable them to utilize advanced research and development capabilities and knowledge to play important roles in global society."

Humanities

Centre for Advanced Research on Logic and Sensibility
Shigeru Watanabe; Professor, Graduate School of Human Relations

Recent developments in cognitive sciences and neurosciences are showing that logic and sensibility in human judgement work as a single unified system, rather than as separate processes. This is referred to as the "convergence of logic and sensibility."

The goal of this Program is to gain an integrated understanding of the convergence of logic and sensibility, from the most fundamental biological level to the level of culture. Through participation in this Program, we will grow researchers in humanities who have learned experimental scientific methods, and experimental researchers with knowledge of the humanities. The researchers grown up in this Program should have deep knowledge, a broad perspective, and advanced skills at world class level and are expected to contribute progress of science internationally.

We have established five "Education and Research Programs," which will conduct joint education and research with overseas institutes based on contracts of collaboration with Keio. Graduate students will complete the "Education and Research Programs" as a Graduate School course, and will learn approach to research in combined fields through practical research activities.

Overseas collaborations will also be actively undertaken, encompassing not only joint research with Cambridge University, the University of Vienna, Bielefeld University, Ecole Supérieur d'Electricité (Supelec), and Ecole polytechnique, but also collaborating with Keio University in the education of young researchers to foster researchers who can take part in international activities.

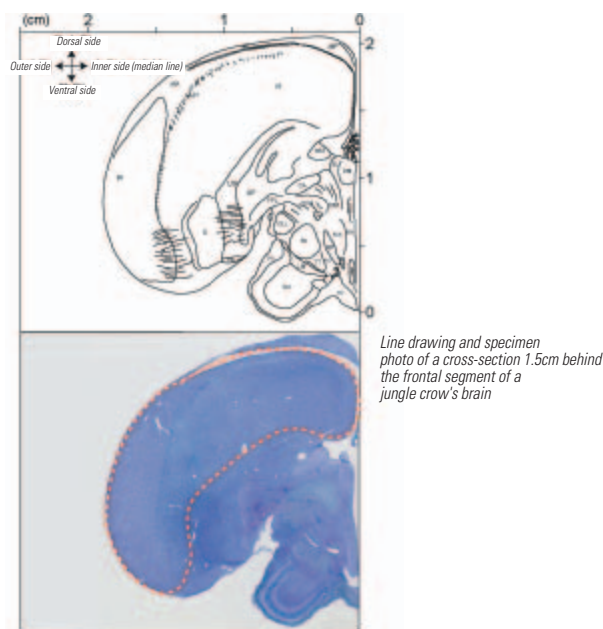
Toward an Integrated Methodology for the Study of the Mind —CIRM: Centre for Integrated Research on the Mind—

Program Leader: Professor Taro Nishimura, Graduate School of Letters
<http://www.cirm.keio.ac.jp/en/>

Because 2006 is the last year of this program, based on the results achieved up to now in five projects, extensive research has been conducted in combined fields cutting across all these projects, in order to develop an integrated methodology. As a result, results have been demonstrated in joint research between projects. Examples of this joint research includes research on mechanisms in the brain for making aesthetic judgments ("Evolution/development" and "Representation" Projects), research on mechanisms in the brain for making logical judgments ("Evolution/development" and "Logic/Language" Projects), and research related to genetic factors in logical judgments. Six international research gatherings have also been held to bring together past research achievements, including international symposiums on language, the mind, and the brain. The international symposium held in August 2006, entitled "Integration of Comparative Neuroanatomy and Comparative Cognition," included presentations by eight researchers active on the front lines of comparative anatomy and comparative psychology (six from overseas and two from Japan), along with presentations by six young researchers and eight poster presentations by graduate students. The goal of this symposium was to integrate comparative cognitive research and comparative neuroanatomy. A summary of the results have been published in "Integration of Comparative Neuroanatomy and Cognition" (CIRM / Keio University Press). This text also contains the world's first mapping of a crow's brain, which was created through the program. This brain map was published on the Internet, and had received 6,400 hits at the time of this writing. Among the other events were three multi-field international round table discussions including a discussion meeting on neuro-aesthetics with Prof. Zeki and a discussion meeting on self-cognition with Prof. Keenan; seven lectures including a lecture on concepts and images in the middle ages by Prof. Saunders; ten seminars and workshops including a seminar on logic by Prof. Melli_s; and three exhibitions.

In terms of international interactions, active efforts were made to promote a shift from the international collaborations of the past, which focused mainly on personal interactions, to formal collaborations based on contracts between research institutions. In order to achieve this goal, research institutes with a past record of

research interactions (e.g., publication of joint papers or hosting of joint symposiums) were selected, and collaborations involving these institutions were actively undertaken. As a result of these activities, it was possible to complete interaction contracts regarding education and research with Cambridge University, the University of Vienna, the University of Paris, Ecole Sup_rieur d'Electricit_ (Supelec), and Bielefeld University.



Development of a Theory of Market Quality and Empirical Analysis Using Panel Data

Program Leader: Professor Naoyuki Yoshino, Graduate School of Economics
<http://www.coe-econbus.keio.ac.jp/>

Research on a Theory of Market Quality

As explained in the texts "System Reform in the Age of Quality" (Iwanami Shoten; 2006) and "Law and Economics" (2007) by Makoto Yano, the term "Market Quality," which is central to the theory of this COE research, refers to appropriately designed laws and systems supporting markets, and the creation of environments in which those markets can function. As part of efforts to form new strategies and international research centers based on this theme, the International Journal of Economic Theory (Blackwell) was published to inform the world at large about this research. To further promote the growth and development of new researchers, a teleconferencing system was put in place in May 2007, with joint seminars being held for researchers in this program as well as Kyoto University Institute of Economic Research COE Program researchers and graduate students from both universities.



Remote seminar with the Kyoto University Institute of Economic Research COE

International Journals

Asian Economic Papers / International Journal of Economic Theory
Asian Economic Papers (MIT Press)

The International Journal of Economic Theory (Blackwell)

(Many editorial pieces have appeared in several national newspapers, such as the *Asahi Shimbun*.) / Through participation in the editing of submitted papers, these Journals provide the researchers in our program and graduate students with a valuable opportunity to learn while coming in contact with cutting-edge international research.

International Research Networks

Princeton University / Erasmus University Rotterdam (The Netherlands) / Bruegel (Belgium) / Columbia University / Chinese Academy of Social Sciences (CASS) / Korea Institute of Economic Policy (KIEP) / Thai Ministry of Finance Research Institute / United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)

Transmission of information and graduate school education through international conferences

International conferences related to theoretical economics / International conferences in Japan, Korea, China, and Europe / Asian Economic Panel Meeting in Washington / Asia Europe Economic Forum in Brussels
 These international conferences and seminars are used as a venue for the education of graduate students.

Analysis of Keio Household Panel Data

An empirical analysis of market quality focuses on the roles of laws and policy administration which must be implemented to create high quality markets. This requires well-designed longitudinal data, with appropriate set of questions in line with our research theme, which

surveys the same individuals, households and companies, repeatedly overtime. The Keio Household Panel Survey (KHPS) is the first comprehensive panel survey covering a wide range of topics such as income and savings, employment, attitudes towards jobs, and working hours. A total of 4,000 households, 7,000 male and female respondents are repeatedly surveyed so far. The main research findings using the KHPS are published in the Program's research findings report, "The Dynamism of Japanese Household Behavior" each year [Higuchi et al. (2005, 2006, 2007)]. The report presents detailed analyses of the influence of changes in legal and taxation systems on household employment, savings behavior, family structure, and market quality. These research findings have influenced Japanese government policies towards, for example, fertility decline, amendments to the Equal Employment Act, and the growing presence of part-time workers.

One of the purposes of the KHPS is to contribute the overall improvement of research activities in the field of social sciences. Accordingly, the micro data of the first survey will be released in August 2007. The data will also be given to the Luxembourg Income Study, an international research institute that collects household panel surveys in various countries and provides them to the researchers all around the world, so the KHPS can be used by foreign researchers. Furthermore, based on research activities in this Program, Keio University has been officially accepted as a member of the Global Network on Inequality, hosted by Princeton University, and the conferences and research projects will be conducted jointly by Keio and Princeton. In line with these activities, a formal agreement is expected to be completed in the near future regarding an exchange program between Princeton University and Keio University for instructors and graduate students.

Research based on International Collaborations with Institutions in Asia and Europe

In Asia, a large segment of capital was moving in the form of bond investments in Europe and the U.S., and this capital came back to Asia in the form of hedge funds, creating one of the factors that led to the Asian currency crisis. In order to encourage substantial savings in the Asian region, it is essential to increase the "quality of financial markets" in Asia. Elements that are required include diversification of financial products, establishment and maintenance of financial markets, laws, and systems, and exchanges of information. The construction of Asian bond markets and exchanges of information via the Internet are being promoted, and as a part of efforts to develop the bond market, trust information institutions have been established to contribute to the construction of bond markets for the maintenance of these infrastructures (revenue bonds) and the establishment of investment loan markets for small and medium-sized companies. All of these activities have been linked to the formation of actual government policies.

Research at this COE incorporates joint research with the United Nations, the Japan Bank for International Cooperation, the ASEAN Secretariat, the Asian Development Bank, Tsinghua University, Bruegel, G_teborg University, and Columbia University. The Center has also formed a network with Asia, Europe, and the U.S., and publishes the Asian Economic Papers (MIT Press).

Designing toward the Ordering of Political Society in a Multi-cultural and Pluri-generational World

Program Leader: Professor Yoshiaki Kobayashi, Graduate School of Law
<http://www.coe-ccc.keio.ac.jp/en/>

The goal of the 21st-Century COE "The Center for Civil Society with Comparative Perspective" (the 21 COE-CCC) is to "achieve ordering of a political society in a multi-cultural and pluri-generational world." It places a focus on research regarding public opinions and attitudes in a multicultural world, expanding networks in Japan as well as Europe and other parts of Asia, and conducting ambitious research activities aimed at forming an international Center.

Promotion of International Collaborations

In 2006, the 21 COE-CCC established the following new international collaborations to promote a joint research system with overseas research institutes, particularly in Korea.

- Completed a formal agreement regarding academic exchanges with Yonsei University in Korea, which was selected as a "BK21" (the Korean version of the 21st-Century COE) in the field of politics (November 24)
- Completed a formal agreement regarding academic exchanges with the Korean Regional Assembly Development Institute and the National Youth Policy Institute (June 1, October 1). Conferences were held, and a domestic survey was also conducted based on contract research from National Youth Policy Institute.
- Collaborations have been strengthened with a number of other research institutes inside and outside of Japan, including the Asian Consortium for Political Research (APCR), the National Women's Education Center (NWECC), the JES IV Research Council, the Korean Election Study Association (KESA), and the Yonsei University BK21 in Korea. Many sessions were conducted at the 4th International Symposium based on applications from these research institutes.
- In order to further strengthen collaborations with researchers outside of Japan, research cooperation relationships were established with research institutes and universities inside and outside of Japan conducting research on civil society (currently 42 researchers at 35 universities).

The fact that the 21 COE-CCC has been selected as a partner by so many research institutes in Japan and around the world is proof that it is globally recognized as an outstanding center for research in civil society.

International Activities

Utilizing the international collaborations outlined above, the 21 COE-CCC has undertaken the following international activities to transmit the results of that research to the world at large, and to build broad networks of researchers.

- Conducted large-scale surveys of civil society in Japan, Guatemala, India, and Korea. At present, data input and analysis of survey results for a total of 15 countries have been completed, and this data has been stored in "Civil Society Data Archive" equipped with a

multilanguage search function in five languages (patent acquired). This archive is made available to researchers worldwide as a comprehensive database on civil society research.

- The 4th International Symposium was held in November, welcoming 29 persons from other research institutes in Japan and 37 persons from overseas research institutes. There were a total of 63 research reports in 20 sessions, which were attended by 806 participants from Japan and around the world.
- Based on the academic exchange agreement noted above, the 5th Young Researchers' International Symposium was held in collaboration with the Yonsei University BK21 (Yonsei University; Seoul, Korea; December 21-22). With the goal of promoting international manpower development, young researchers were dispatched from centers in both Japan and Korea, and a total of 31 research reports were presented in combination with the joint sessions at the 4th International Symposium outlined above.
- A total of six persons from the 21 COE-CCC of participated as presenters at the 20th meeting of the International Political Science Association (IPSA; Fukuoka; July 9-13). This Center's results were made available to overseas researchers.
- Volumes 6 & 7 of the European refereed Journal of Political Science and Sociology were published to provide a venue for international debate on civil awareness research (available in the libraries of 60 major overseas universities)

Up to now, the results of joint research activities between the 21 COE-CCC and research partners inside and outside of Japan and been published in a total of 21 volumes in a series entitled "Trends in Civil Society in a Multicultural World." This series has been covered in numerous newspaper reviews, and three of these volumes have already been translated into other languages, evoking a positive response that has transcended national borders.



Policy Innovation Initiative: Human Security Research in Japan and Asia

Program Leader: Professor Jiro Kokuryo, Graduate School of Media and Governance
<http://www.coe21-policy.sfc.keio.ac.jp/en>

This 21st Century COE Program has been pressing ahead with its current initiative of establishing a center for *sougou seisakugaku*, or integrated policy management, through the study of human security. In 2006, based on the positioning of integrated policy management as "studies in practical knowledge," this Center accumulated further "practical knowledge" based on specific themes, deepened its perspectives on this field, and endeavored to proliferate and pass on this knowledge both in Japan and overseas.

The approach of *sougou seisakugaku* is a cyclical one, in which research activities are conducted targeting the discovery and resolution of problems in specific fields, and the models are created to extract universal and generalized knowledge from that research. These models are then further refined through proliferation and transfer to other fields. The "venue" for collaborations therefore plays an extremely important role in *sougou seisakugaku*. Since the start of its activities, this COE has emphasized collaborations with research satellites (RS) not only in Japan (Yokoyama, Fujisawa, Yamagata, Nagano, Kita-Kyushu, Saga, Toyama, etc.), but also in Vietnam, Thailand, China, and other countries. This year, based on an awareness that "Research Satellites should not be limited to a single research theme, but should be equipped with continuity and scalability," these RSs were narrowed down, and research activities are currently being promoted at 27 carefully selected RSs. The specific research results derived from these activities have been the subject of ambitious information transmission activities during 2006, including 23 working papers, 53 papers published in journals (including 14 papers in refereed journals and articles in non-academic periodicals), and four jointly authored texts. On January 27, 2007, specialists in the field of *sougou seisakugaku* were invited from across Japan to participate in a symposium entitled "Best Practices in Policy Management Studies," where research results were presented by seven young researchers. The discussions conducted at this symposium are also reflected in the policies for *sougou seisakugaku* doctoral papers and in the selection standards used by the *Sougou Seisakugaku* Journal ("Keio SFC Journal; Special Issue on Policy Management"). The first edition of the *Sougou Seisakugaku* Journal is scheduled for publication in the fall of 2007.

Doctoral students employed as COE research assistants (RAs) have been extremely active in terms of promoting "Studies in practical knowledge" in relation to human security. We are aware that that fostering young researchers is a key mission of the COE,

and in that regard, five doctoral students active as RAs in the past have been awarded doctoral degrees, in addition to two other doctoral students in this COE program. Approximately 15 more doctoral degrees are expected to be conferred upon students affiliated with this program over the next few years.

We believe that the initiative of *sougou seisakugaku* should not only be extended within Japan, but also worldwide. This COE program is working to establish a framework for researchers in Japan to exchange research results with their counterparts in Vietnam, Thailand, and China on an ongoing basis. We also included *sougou seisakugaku* in the curriculum of the International Advanced Degrees Program (in which a master's degree must be completed in English) offered by the Graduate School of Media and Governance. In the 2007 academic year, two *sougou seisakugaku* courses were offered: Policy Management 1 (Development and Human Security) and Policy Management 2 (Policy Formation and Social Innovations). The aim here is the international extension of *sougou seisakugaku* and the fostering of young researchers. In addition, it is hoped that through collaboration and joint operations with domestic universities that have their own policy management faculty, it will be possible to strengthen the domestic-overseas network of *sougou seisakugaku*.



Best Practices in Policy Management Studies (January 2007; Mita Campus)

Understanding and Control of Life's Functions *via* Systems Biology

Program Leader: Professor Hiroshi Yanagawa, Graduate School of Science and Technology

<http://www.coebio.keio.ac.jp/index.cgi?je=1>

After launching in 2002, the COE has completed its fifth year of activity. The center aims to be a world-leader in research and education related to the understanding and control of life's functions through systems biology. Towards that aim, three resource domains at Keio University (namely, genome, proteome, and metabolome analysis; bio-probe technology; and *in vivo* life phenomenon analysis) are used to promote convergence between informatics, experimental life science, engineering, and medical treatment. Over the past five years, the center has had over 322 reports published in international journals such as *Nature*, *Nature Cell Biology*, *Nature Biotech*, and *Science*.

To promote a collaborative research environment in systems biology, the center is strengthening its information network for real-time exchange with sub-campuses. The network enables remote lectures on the latest research results and target-oriented progress workshops. In 2005 and 2006, intensive workshops were held to promote exchange among sub-campuses and research assistants in different fields at the Shonan International Village. Other successful events included hosting three international and local symposia and co-hosting 10 others.

The center has introduced an overseas research aid program to further support post doctorates (PDs) and research assistant (RAs). Each year 50 RAs (including exchange students) are selected to participate in the program. To develop internationally talented researchers in molecular cell biology (wet) and computational biology (dry), the center participates in collaborative research with sub-campuses and awards the COE Research Cooperation Program Certificate for completing appropriate course work in systems biology. A total of 37 RAs have been awarded the certificate thus far.

Students in specific majors participate as short-term visiting fellows in targeted research at sub-campuses. Excellent results have been produced in various fields, including "the discovery and application of new red blood cell function through bio-simulation" and "gene network and protein interaction analysis." Participants in bio-simulation of red blood cell function included three

RAs from the Graduate School of Science and Technology and 5 RAs each from the Graduate School of Medicine and the Graduate School of Media and Governance. These RAs were sent to multiple sub-campuses for extended short-term laboratory work. Two of the RAs were able to complete English papers on the research topic. Participants in gene network and protein interaction analysis achieved big advances in research by combining large-scale analysis through original *in vivo* expression methods of the human gene network (Graduate School of Science and Technology) with informatics analysis of domains and complexes generated from interaction data (Graduate School of Media and Governance). The participants were thus able to efficiently combine wet and dry approaches in biology. The center also collaborates with outside institutions such as RIKEN and UCLA. Students cooperating with these institutions have achieved excellent results in a number of areas, including the prediction of new non-coding RNA from cDNA sequences and the discovery of a new mechanism to improve drug sensitivity of tumor cells.

The center promotes collaboration with overseas institutions. Thus far, seven RAs have been sent abroad to engage in joint research from three to six months at Massachusetts General Hospital (Prof. Rakesh), Duke University (Prof. Jarvis), University Aalborg/Denmark (Prof. Sinkjaer), Forsyth Institute/Boston (Dr. Soukos), University of Nebraska-Lincoln (Prof. Moriyama), University of Auckland/New Zealand (Dr. Connor), and UCLA (Prof. Bonavida). Each year since its establishment, the COE has welcomed exchange students from China, South Korea, Taiwan, Thailand, Bangladesh, and other countries.

For 2007, the center has been selected as a Global COE for "Humanoid Metabolomic Systems Biology." Based on a foundation in collaboration and interdisciplinary research among affiliates and sub-campuses, the center will strive further to fulfill its mission as a research platform for global collaboration. Going forward, we look forward to the continued support and advice of all our partners.

[Chemistry, Material Sciences] FY2002

Function Creation Oriented Life-Conjugated Chemistry

Program Leader: Professor Haruma Kawaguchi, Graduate School of Science and Technology

<http://www.lcc.keio.ac.jp/index.cgi?je=1>

Challenge 2006: LCC as an International Research Center

The 21st Century COE "Function Creation Oriented Life-Conjugated Chemistry" has made great strides during the past fiscal year of 2006 to crystallize efforts as an international research center and to develop human resources. As an international research center, LCC aims to announce its research results globally while placing great emphasis on collaboration and exchange with institutions abroad. In addition to deepening the network of individual researchers abroad, LCC also cultivates partnerships with other institutions. In 2005, Bio groups of Yonsei University (South Korea) and the LCC bio group held a joint symposium in Korea. This was followed up a year later with a symposium in Japan. These joint events have served to strengthen the ties between the two institutions. LCC also forged a partnership with the Aachen University of Technology (Germany). The first fruits of this tie up appeared in October 2006 when LCC members visited Aachen University of Technology.

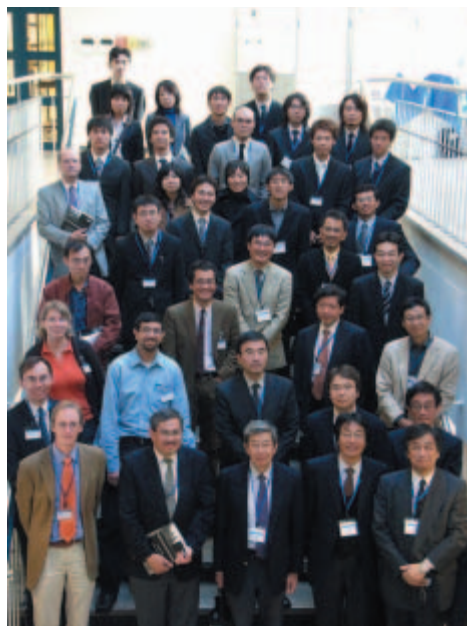
To help disseminate research results globally, LCC decided to team up with Aachen University of Technology, which enjoys a 50-year relationship of exchange with Keio University. On October 3, 10 LCC members and 19 RAs flew to Germany to participate in the COE-LCC Keio-Aachen Joint Symposium held at Aachen University of Technology on October 5. In addition to 10 lectures by LCC members and four by Aachen, LCC showed 19 poster exhibits while Aachen displayed 24. Overall, the symposium was a great opportunity for LCC to promote itself on the international stage. This symposium would not have been possible without the dedicated efforts of Professor Jun Okada from Aachen University of Technology. Through his good services, the ties between Keio and Aachen have been deepened even further. One day after the symposium, an event was held to commemorate 50 years of exchange between Aachen and Keio. The event was attended by Headmaster Inasaki and Director Obi of the International Center in addition to 29 LCC members.

Since its inception as a COE, LCC has held nine international meetings. Three of those meetings were related to diamond electrodes. The last of these events was held in March 2007 as the final COE event. LCC has made every effort to be a global platform for future materials research at Keio University. Through cooperation with Dr. Akira Fujishima and Visiting Professor Yasuaki Einaga, each of three international symposiums was able to host over 10 overseas researchers and over 100 total participants who engaged in lively discussions. We have steadily built upon these successes to steadily strive towards our research objectives.

LCC has also taken the initiative to promote human resource development of young researchers from an international perspective. Each year RAs have been required to

announce their results at international forums. Young RA were also able to participate in the short-term overseas study program. A total of four students were selected to study abroad for two to five months to gain invaluable research experience. Here in Japan, LCC supported PhD students from abroad who wished participate in short-term study at Keio University. Two students have been able to participate in the cooperative student research program under the Graduate School of Science and Technology. The COE-LCC has played a major role in the development of talented students at home and abroad. Since its establishment five years ago, LCC has continued to mature as a global research platform. From this solid base, we fully expect young researchers to flourish in the years to come.

We would like to extend our sincerest thanks to everyone who has supported LCC through the years.



Japanese and German researchers along with LCC RA participants after COE-LCC Keio-Aachen Joint Symposium

Optical and Electronic Device Technology for Access Network

Program Leader: Professor Toshiaki Makabe, Graduate School of Science and Technology

<http://www.coe.keio.ac.jp/index.cgi?je=1>

The 21st Century COE "Optical and Electronic Device Technology for Access Network" completed its fifth year of activity in 2006. From 2007, the center passes the baton to its successor, the Global COE "High-Level Global Cooperation for Leading-Edge Platform on Access Spaces." The Global COE Program is a MEXT initiative for the development of human research resources.

COE activities have produced many achievements or firsts such as 1) research for collaborative convergence between networks and optical & electronic devices, 2) wireless interconnect LSI chips, 3) visible light communications, 4) haptics technology and real-time interactive communications, and 5) PLZT optical switches and video content distribution systems. In addition, 25% of the PhD students participated as COE research assistants have been able to earn their degrees early. Students that received their doctorates in this environment of "academic fusion" where instructors from diverse disciplines converge, launch themselves from a firm global base to embark on career paths full of expectations.

Members of the center have achieved remarkable success with over 608 journal papers, 167 lecture invitations and 846 research presentations at international forums, and 33 international and domestic awards. The center has formed core partnerships with EC Lyon Institute of Nanotechnology (France), Harvard University (USA), and Xian Jiaotong University (China). It has also engaged in joint research with 30 university research institutes overseas. These two initiatives have promoted international collaboration in research and education related to electronic information systems. These invaluable assets will now be transferred to the Global COE where they will be received with great expectations. We would like to extend our warmest thanks to COE members, participants, and the executive office for their precious support in successfully shaping the destiny of this center over the past five years.



"Network of Excellence"

Next Generation Media and Intelligent Social Infrastructure

Program Leader: Professor Hideyuki Tokuda, Graduate School of Media and Governance

<http://www.coe21.sfc.keio.ac.jp/index.html.en>

Overview

At this center, IT & digital media researchers and policy management researchers have engaged in creative cooperation within a single structure, forming a "skewered layer" model of three groups: Next-generation infrastructure, next-generation applications, and advanced empirical experimentation. The objectives of the center are to support the future ubiquitous network society through examination of social infrastructure for the 21st century and to foster international research and education for discovering new solutions to social and technological problems. Researchers and research assistants (RAs) in each group were made aware of the "skewered layer" model to promote an integrated approach from the point of view of both needs and seeds. In addition to its own members, the center has collaborated with other universities, local governments, and private industry to build an advanced empirical experimentation system with a wide social scale. Indeed, the center has established a unique, global, and interdisciplinary approach to education and research.

At the next-generation infrastructure group, members have developed advanced technologies in a number of areas such as satellite-based internet to interconnect Asia, Smart Space, ubiquitous networks, active & multi knowledge bases, human interfaces, and broadband broadcast media. At the next-generation applications group, members have achieved excellent results in Smart Graphics, SmartWeb, micro-archiving, the elucidation of physical skills, language representation, collaboration technology, and the commercialization of e-learning systems based on empirical experimentation. At the empirical experimentation group, members have announced numerous results internationally. For example, the e-learning, e-governance, and e-space subgroups have implemented a distance learning system, a school education evaluation system, a digital earth system, and other systems. The group has also achieved excellent results in other fields such as education, the environment, e-government, social surveying, and nursing & medical care.

On November 11, we hosted the SFC Open Research Forum 2006 at Marunouchi, Tokyo to give research presentations. Then in December, together with overseas researchers we hosted the "International Symposium on Media Convergence and Social Infrastructure." The symposium provided a platform for research presentations on converging media and intelligent social infrastructure as well as lively discussions on R&D methodology. In addition, the research results achieved through this center have been compiled in book form under the title "Collaborate! SFC Campus of Convergence." For the development of human research resources, the center has helped over 80 young researchers obtain advanced degrees over the past five years. The center's young researchers have also been the recipients of numerous accolades from Japan and overseas, such as the Laval Virtual Grand Prix du Jury & Trophees Sciences et Education Award, the Prix Ars Electronica Honorary, the MIC Minister's Award from the JGN2 R&D Idea Contest, the Young Researcher's Award (Japan Human Interface Society), and the Special Award by Jury (Japan Institute of Marketing Science).

Through international symposiums and workshops, the center has become an essential node for connecting research networks in Japan and overseas. These activities have made significant contributions to research related to social infrastructure for the 21st century. Finally, this center has been able to establish a collaborative R&D model based on interdisciplinary and multiple domain perspectives. This new model is far different from those based on conventional and non-interdisciplinary approaches.

Establishment of Individualized Cancer Therapy based on Comprehensive Development of Minimally Invasive and Innovative Therapeutic Methods

Program Leader: Professor Yutaka Kawakami, Graduate School of Medicine
<http://www.coe-cancer.keio.ac.jp>

In 2006, the COE program focused on four translational research projects that could be evaluated through clinical trials.

The objective of the first project for "individualized medication based on characteristics of both cancer cells and patients" is to search for and evaluate biomarkers that can predict anti-cancer drug sensitivity and to develop individualized medication through evaluating anti-cancer drug metabolism. The objective of the second project for "development of diagnostic and therapeutic methods targeting sentinel lymph nodes" is to develop sentinel node navigation surgery for gastric and breast cancers through joint clinical trials with multiple facilities. The objective of the third project for "development of high performance master-slave manipulators and tactile sensing technology in robotic surgery" is to develop the control mechanism for a robot with built-in tactile sensing and to promote clinical applications of minimally invasive heart surgery by the port-access MICS method. The objective of the fourth project for "development of minimally invasive therapy focusing on immunotherapy and cryoablation" is to evaluate clinical trials in cryoablation and immunotherapy. The combined treatment of cryoablation and immunotherapy using dendritic cells which were manufactured at a cell processing facility in the university hospital was also conducted.

The COE program established 4 new facilities to promote translational research. The medico-engineering coordinating section promotes collaborative works between researchers from School of Medicine and Faculty of Science and Technology. At the Minimally Invasive Surgery Training and Education Center (MISTEC), in addition to training young surgeons in preoperative procedures, the center evaluates preclinical safety of newly developed technology. The sample storage facility has been built to provide comprehensive preservation of pathological dissection, surgical, and clinical specimens. And the Vector Processing Center (KVPC) has introduced a computer automated control system and preparation of HSV adjuvants began for clinical use.

To cultivate a rich global orientation in young researchers, the COE program has

invited foreign researchers to give lectures, conducted teleconferencing with overseas research institutions, and promoted joint research projects. "Act Now for the Future-Recent Advances in Individualized Cancer Therapy" was held in the Shinanomachi Campus. The symposium included a live demonstration of sentinel node navigation surgery for gastric cancer, performed at the Seoul National University in South Korea. At a subsequent international forum, the center gave a live demonstration of mitral valve reconstruction using port-access MICS, which is a minimally invasive method for heart surgery, was also performed. These demonstrations were received with wide acclaim by researchers in Japan and overseas.



Live demonstration of sentinel navigation surgery for gastric cancer performed in Seoul, South Korea at the international symposium held in the shinanomachi campus.



Invited overseas lecturers for the same symposium
 Jacques Marescaux (center left) and Dr. Dave S. B. Hoon (center right)

Basic Study and Clinical Application of the Human Stem Cell Biology and Immunology: Approaches Based on the Development of Experimental Animal Models

Program Leader: Professor Hideyuki Okano, Graduate School of Medicine
<http://www.coe-stemcell.keio.ac.jp/>

Based on prior research, in 2006, the center focused on the 10 themes listed below.

1. Elucidation of stem cell control mechanism in the adult brain and neuronal regeneration
2. Mechanism of maintenance of undifferentiated state of hematopoietic stem cells and molecular analysis of niches
3. Analysis of pluripotency in human peripheral blood mononuclear cells and related applications in regenerative medicine
4. Isolation of tissue stem cells and functional analysis
5. In vivo experimental medicine using disease animal models
6. Operation of cell processing center for regenerative medicine and development of cell therapy
7. Development of autoimmune disease animal models
8. R&D for new vaccine using dendritic cells
9. Pathology of autoimmune disease and development of new therapy method
10. Analysis of the role of infection in autoimmune disease pathology

As a result of this focused approach, members of this COE program have become the senior (corresponding) authors of four papers related to regenerative medicine and stem cell research published in the journal, *Nature Medicine*. This COE has thus established itself as a world-leading research base.

In addition, the center engaged in the following special activities during 2006.

COE animal database (SCAD)

The Shinanomachi Campus Animal Database provides an archive of genetically modified animals. The database promotes the efficient use of experimental animals and joint research projects. (Person in charge: Associate Professor Matsuo Koichi) Since January 16, 2007, six groups from the center have registered over 150 items in the database. In addition, group members interested in the maintenance of these data items have received an access password.

Cultivating a global orientation in young researchers

In October 2006, the center held a symposium and a luncheon discussion for Nobel Laureate in Chemistry Dr. Peter Agre. These events provided graduate students and young researchers with a precious opportunity to exchange ideas with Dr. Agre. To forge research exchange with the Stem Cell Research Center at Lund University, main COE members visited Sweden to help launch the center and to participate in the Joint Keio-Lund Symposium.



Keio COE-Lund Stem Cell Research Center Kick Off Meeting held at Lund University in June 2006

Integrative Mathematical Sciences: Progress in Mathematics Motivated by Natural and Social Phenomena

Program Leader: Professor Yoshiaki Maeda, Graduate School of Science and Technology

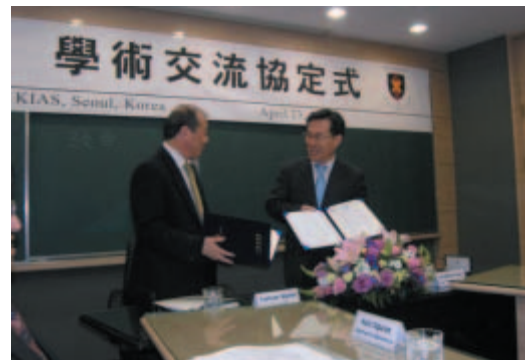
<http://coe.math.keio.ac.jp/index.htm>

The 21st Century COE "Integrative Mathematical Sciences: Progress in Mathematics Motivated by Natural and Social Phenomena" has placed great emphasis on becoming a center of international activity. For example, in 2006 the center took the initiative in forging collaborative agreements with many international education and research institutions related to mathematical sciences. These agreements were made possible thanks to the many international exchange activities hosted over the years through the Department of Mathematics (Faculty of Science and Technology) and the Center for Mathematics (School of Fundamental Science and Technology (Graduate School of Science and Technology)). Through invitations to overseas researchers and joint research efforts, the COE has further enhanced this already excellent record of exchange. COE also cooperates with Keio University Organization for Global Initiatives (OGI), which has a long history of comprehensive international activities. Under the auspices of OGI, COE has been able to create even more opportunities for cooperation in international education and research. One example is collaboration with the Department of Mathematics & Statistics at Boston University, USA. With the help of Keio University, which operates student exchange programs, the COE has promoted joint research through exchange among PhD students and collaboration among faculty members. Students from Boston University have already visited Keio University to engage in stimulating discussions with young COE researchers.

A second example is collaboration with the University of California, Berkeley. Professor Alan Weinstein of Berkeley is a COE advisor who has provided invaluable counsel in the formation of our center. Through his efforts, the center has been able to tie up with Berkeley for collaboration on education and research. We are now planning to invite faculty and young researchers from Berkeley to visit our center. A third example is the collaborative agreement made with Ecole Polytechnique in Europe. This institution already has a broad agreement with Keio University. So the COE has been able to forge ties with the Department of Mathematics.

In addition, based on the resounding success of the UK-Japan Winter School held annually, the center has been able to make a collaborative agreement in education and

research with Warwick University. For activities in Asia, the center has forged collaborative agreements with Yonsei University (South Korea) and the Korea Institute for Advanced Study (KIAS). (The image shows the agreement ceremony.) The center has also made collaborative agreements with the Rumanian Academy of Sciences, the Vietnamese Academy of Sciences, and the Universidad de Los Andes (Colombia). These agreements have enabled young researchers from abroad to visit Keio University and participate with young COE researchers as part of an invitation program for the cultivation of research talent. In addition to international collaboration agreements, the COE is currently promoting cooperation with various other institutes. Through these efforts, the COE has received approval to establish the Center for Integrative Mathematics as one of the Keio Advanced Research Centers (KARC). The aim of the new center is to become a platform for global education and research.



Agreement ceremony with KIAS (South Korea)

[Mechanical, Civil, Architectural and Other Fields of Engineering] FY2003

System Design: Paradigm Shift from Intelligence to Life

Program Leader: Professor Kazuo Yoshida, Graduate School of Science and Technology

<http://www.coesys.keio.ac.jp/English/index.html>

In 2006, the center focused on well-defined topics in system life research while promoting close collaboration among COE members and actively pursuing exchange with research institutes overseas. These efforts have led to the following research achievements.

- Establishment of safety technology able to respond to unpredictable conditions (Human-Scale Product Innovation Project)

The center has developed an intelligent control system that uses a cubic neural network, which incorporates multidimensional parallel processing, and has established parallel processing methods for a multi time scale axis. This type of control system is essential for the design of robots that will one day coexist with humans in an open environment. In addition, COE product innovation efforts for designing a new guide robot have led to the development of new information processing methods in robotics, human interface programs, and safety mechanisms.

- System life approach to architectural design (Macro Scale Product Innovation Project)

As an actual example of product innovation in the field of architecture based on the system life concept, the center designed the government building for Yusuhara Town in Kochi Prefecture.

Compared to the old building, the new government building uses 41% less electricity. Office workers have also given the building high praise for its work environment efficiency. Based on the system life concept, we have shown how the use of multiple passive and active controls in parallel is an effective way to reduce the environmental burden and to optimize the living comfort.

- New approach to development of artificial organs (Common platform technology for system design)

In the field of artificial organ research, the center has focused on interaction with cells through physical stimulation. The aim of this research is to achieve regenerative and adaptive bionic design through the expression of environmentally compatible functions. Using a counterintuitive thinking strategy, the required functions are revealed through interactions with the environment. Our results clearly show how organic coordination between hepatic cells can cause systolic function expression in regenerated bile capillaries. This achievement opens a window of opportunity for artificial livers.

For the development of human research resources, the center has implemented a research assistant/post doc employment program and an international internship program. In addition, the center has established an Advanced Design School that offers three courses: Product & System Design, Architecture System Design, and Space System Design. Some course work is given as an English lecture series by internationally reputable instructors. Through these courses, the center has stimulated the development of new fields of study and enabled young researchers to pursue the potential of "system life" design from both research and educational perspectives. In addition, the international lecturers have helped to cultivate a global orientation in our young researchers.

The international internship program has deepened the bonds of exchange by enabling young researchers to pursue studies at institutions overseas such as University of Sheffield, Carnegie Mellon University, Hong Kong University of Science & Technology, Industrial Physics and Chemistry Higher Educational Institution (ESPCI), Université de Lille (France), Institut Curie, Université de Rouen, Dantec Dynamics, Technical University of Denmark, and University of Warwick.

In other activities, the center has also invited Professor Pfeifer, Professor Feng, and other academic luminaries to participate in international workshops (see below) for stimulating discussions on system life research and related topics.

10/6/06	COE Workshop "Challenges for Life-Based Systems Development"
17/11/06	COE International Workshop "Life-Based Approach for Safety & Security of Large Complex Systems"
4/12/06 - 6/12/06	Asia-Pacific Workshop on Structural Health Monitoring
6/12/06 - 8/12/08	US-Japan Workshop on Bio-Inspired Sensor Networks: Learning from Life
12/3/07	The 3rd Symposium on System Design: Paradigm Shift from Intelligence to Life

FY2006 Financial Position

Ended on March 31, 2007

1 Balance Sheet

		Million yen	
Assets		Liabilities	
Fixed assets	288,802	Fixed liabilities	57,208
Tangible fixed assets	182,096	Long-term borrowings	6,634
Land	27,503	School bonds	3,925
Buildings	86,936	Retirement allowance reserve	29,080
Structures	4,603	Pension reserve	17,569
Equipment and supplies for education and research	22,360		
Other equipment and supplies	419	Current liabilities	32,301
Books	36,659	Short-term borrowings *2	2,346
Vehicles	17	School bonds *2	1,727
Construction in progress	3,599	Accounts payable	13,338
Other fixed assets	106,707	Advances received	12,928
Land lease rights	40	Deposits	1,857
Telephone subscription rights	72	School trip deposits	105
Facility use rights	154		
Deposits	12	Liabilities total	89,509
Profit-making business capital	3,750		
Long-term loans	2,229	Funds	
Specified assets *1	58,087	Funds	
School bond assets producing interest	5,652	First fund *3	277,753
Reserve assets for the third fund	36,712	Second fund *4	11,438
		Third fund *5	36,712
		Fourth fund *6	8,622
Current assets	66,492	Funds total	334,525
Cash deposits	25,706		
Accounts receivable	12,511	Balance of income and expenditure	
Inventories	616	Carried forward to next year	△68,739
Negotiable securities	26,589		
Assets for school trip deposits	105		
Others	965		
Assets total	355,295	Total of liabilities, funds, and balance of income and expenditure	355,295



Keio Corporate Administration "Jukukan-kyoku" at Mita Campus

*1 Specified assets

Assets reserved for specific purposes such as the "retirement allowance reserve," the "pension reserve," and the "Second Fund."

*2 Short-term borrowings and school bonds

Current portion of "long-term borrowings" and "school bonds (Jukusai)" expected to be repaid in FY2007.

*3 First Fund

Funds related to the acquisition and maintenance of fixed assets (acquisition cost of fixed assets such as school land, school buildings, equipment and supplies, books, etc. acquired by self-financing).

*4 Second Fund

Fund related to future acquisition of fixed assets (4.2 billion yen transferred in FY2006)

*5 Third Fund

Amount of assets related to scholarships and research funds.

*6 Fourth fund

Required working capital (In accordance with accounting standards, 700 million yen transferred in FY 2006.)

Source: *Activities and Financial Position of Keio Gijuku: FY2006 Business Report*

2 Income and Expenditure Statement

			Million yen		
Income	All of Keio (Keio Gijuku)	University only	Expenditure	All of Keio (Keio Gijuku)	University only
Imputed income			Personnel	63,249	33,395
Tuition and other student fees	44,141	36,464	Expenses for education and research*3	53,119	27,597
Other fees	2,390	2,088	Expenses for general administration	3,990	852
Donations*1	10,463	3,067	Interest on borrowings	202	119
Subsidies*2	12,347	9,542	Loss on disposition*4	753	432
Income from asset management	6,821	204	Provision for allowance for doubtful accounts	13	0
Asset sales differential	180	0	Discretionary reserve	-	-
Income from business	8,009	7,460	Total expenditure	121,327	62,395
Income from medical services	42,008	0			
Miscellaneous income	3,240	2,804	Current excess over expenditure	3,217	-
Imputed income total	129,600	61,628	Brought forward from last year	65,522	-
			Carried forward to next year	68,739	-
Transfer to capital fund	△ 11,490	△ 4,852	Imputed income total -		
			Total expenditure	8,273	△ 766
Income total	118,110	56,777			

*1 Donations

Includes contributions in goods.

*2 Subsidies

In FY2006, subsidies from the Promotion and Mutual Aid Corporation for Private Schools in Japan (PMAC) totaled ¥8,800,939,000. General subsidies account for ¥6,124,939,000 of this amount and special subsidies account for ¥2,676,000,000. Subsidies allocated to individual researchers, such as subsidies for the 21st Century COE Programs and Grants-in-Aid for Scientific Research (Kakenhi), etc., are considered deposits of the school juridical organization. These subsidies, direct research expenses, which take up the bulk of these subsidies, are not included in the subsidies of the financial statement, which are considered imputed income. Accordingly, expenditures corresponding to these subsidies are also excluded from expenditures for education and research.

*3 Expenses for education and research

Research activities funded by subsidies such as Grants-in-Aid for Scientific Research (Kakenhi) are not included (please see *2 above)

*4 Loss on disposition

Most of the loss on disposition in this period is loss on disposal of fixed assets.

The settlement of accounts of the school juridical organization Keio Gijuku is a consolidated account of the following four sectors: the corporation (the head administrative body representing the corporation and various capital funds), the university (including research institutes and libraries), affiliated schools for integrated education (elementary, junior and senior high schools and a foreign language school), and hospitals (Keio University Hospital and Tsukigase Rehabilitation Center).

Source: *Activities and Financial Position of Keio Gijuku: FY2006 Business Report*

Research-related Facilities and Libraries

Research Space for Rent

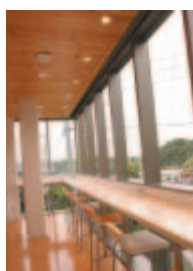
Keio University provides research space and incubation facilities for rent as indicated below. Policies and availability differ by campus, so please inquire in advance for vacancies, rental qualifications, application procedures, application deadlines, etc.

As of July 2007



Sousoukan Building on Yagami Campus

Facility	Outline	For Inquiries
Research Space at the KLL (See pages 9-10)	Total of 32 rooms in <i>Sousoukan</i> Building on Yagami Campus Size: 66.12m ² - 102.49m ² ; Total floor area: 2,519m ² Type A (for chemistry and biology experiments) Type B (for applied physics experiments) Type C (for experiments for heavy materials) Type D (for experiments for light-weight equipments) Type E (for various types of experiments)	Secretariat of the KLL (c/o Office of Research Administration, Yagami Campus) Tel. +81-45-566-1470 E-mail: staff@kll.keio.ac.jp http://www.kll.keio.ac.jp/ Keio Leading-edge Laboratory of Science and Technology (KLL) Tel. +81-45-566-1438 E-mail: liaison@educ.cc.keio.ac.jp http://www.kll.keio.ac.jp/liaison/index.html
Shin-Kawasaki Town Campus (See pages 15-16)	K-Building: 1,388.25m ² I-Building: 1,388.25m ² L-Building: 1,171.36m ² O-Building: 1,388.25m ²	Shin-Kawasaki Town Campus Shin-Kawasaki Keio Frontier Research and Education Collaborative Square Tel. +81-44-580-1580 E-mail: k2-tc@adst.keio.ac.jp http://www.k2.keio.ac.jp
Shinanomachi Research Park (See pages 11-12)	56 units in the Institute of Integrated Medical Research Building Outline: Steel frame with a reinforced concrete structure; 2 under ground floors, 9 above ground floors, and one penthouse floor Total floor area: 24,400m ²	Shinanomachi Office of Research Administration - Administrative Office Tel. +81-3-5363-3879 E-mail: ras-shinanomachi@adst.keio.ac.jp Center for Integrated Medical Research http://www.cimr.med.keio.ac.jp/ Shinanomachi Research Park http://www.rpk.med.keio.ac.jp/ Shinanomachi Office of Research Administration http://www.med.keio.ac.jp/research/index.html
Keio Fujisawa Innovation Village (SFC-IV) (See page 14)	Steel frame structure, 2 floors Site area: 1,825.3m ² Total floor area: 1,470.0m ² Rental space: 906.4m ² Offices: 18; small offices: 3; shared offices: 8 R&D fabrication rooms: 3; office/R&D fabrication rooms: 2 server room: 1	Keio Fujisawa Innovation IM Room Tel. +81-466-49-3910 E-mail: info@sfc-iv.jp http://www.sfc-iv.jp/index.html
Tsuruoka Metabolome Campus (Tsuruoka Leading-Edge Research Industrial Support Center - not a Keio facility.) (See page 18)	29 units, Size: 7m x 10m x 2.8m Steel frame structure, 2 floors Total floor area: approximately 3,700m ²	Planning and Coordinating Division, Department of General Affairs, Tsuruoka City Tel. +81-235-25-2111(ext. 321) E-mail: kikaku@city.tsuruoka.yamagata.lg.jp/ http://www.city.tsuruoka.yamagata.lg.jp/ (HP of Tsuruoka City)



Keio Fujisawa Innovation Village

Library Collections

Keio University has five campuses: Mita, Hiyoshi, Shinanomachi, Yagami, and Shonan Fujisawa, each one of them developing leading-edge research and education in various disciplines, and also high-level medical practice. The Media Centers, centering the library service, branch on each campus to provide intensive support for all these specific activities.

As of March 31, 2007

	Book Stocks		Collections by Material Type				Number of Seats
	Total	Domestic Books	Foreign Books	Domestic Journals	Foreign Journals	Non-book Materials (items)	
Mita Media Center	2,572,403	920,224	1,006,875	235,575	280,677	129,052	1,297
Hiyoshi Media Center	772,911	422,433	207,862	48,051	62,037	32,528	1,368
Shinanomachi Media Center	387,458	63,388	50,105	87,417	180,584	5,964	208
Information and Media Center for Science and Technology	350,431	89,146	43,068	55,177	159,677	3,363	451
Shonan Fujisawa Media Center	349,060	177,879	85,643	39,915	23,600	22,023	1,085
Total	4,432,263	1,659,154	1,393,553	466,135	706,575	192,930	4,409

* There are also more digital media materials (No. of titles: Database - 311, Electronic journal - 29,721, Electronic books - 4,833).



New University Library at Mita Campus



Hiyoshi Media Center



Shinanomachi Media Center

Research Funds at Keio University in FY2006

Research funds at Keio University from national and local public institutions, private businesses, and university funding, etc., totaled approximately ¥15.8 billion in FY2006. The funds include those for the 21st Century COE Program for which Keio University won 12 projects, the largest number for a private university. Other funds include the Special Coordination Fund for the Promotion of Science and Technology "Program to Encourage the Development of Strategic Research Centers," of the Ministry of Education, Culture, Sports, Science and Technology (MEXT).

The charts below show research fund totals classified in various ways, such as by type of fund, by type of external entity making the contribution, by campus, by researcher affiliation and by research field.

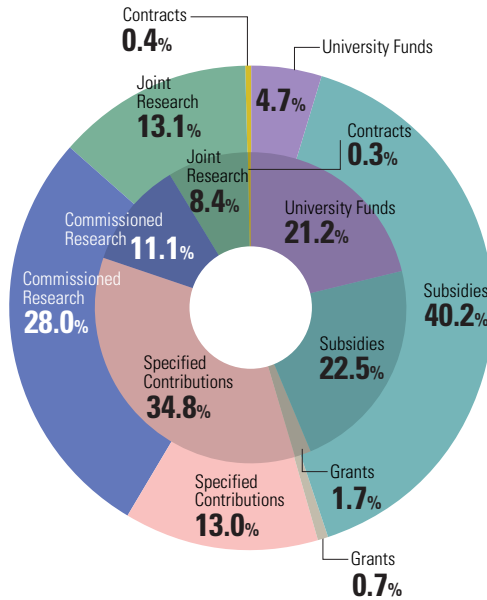
1. Research Funds by Type

When classifying by type of research funds, specified contributions account for the largest number of projects and subsidies account for the largest amount in yen. University funds represent about 5% of the total at 750 million yen. Research funds from external entities represent nearly 95% of the total at 15.1 billion yen.

*The total for university funds includes a contribution from the Private University Academic Research Promotion Project.

Type of Funds	Number of Projects	Amount Thousand yen
University Funds	734	749,592
Subsidies	780	6,387,754
Grants	59	104,794
Specified Contributions	1,207	2,063,242
Commissioned Research	385	4,438,734
Joint Research	291	2,073,601
Contracts	12	59,403
Technical Guidance	0	0
Total	3,468	15,877,120

Research Funding Share by Type
(Amount (outer ring), Number of Projects (inner ring))



Definition

Subsidies: Research funds provided mainly by government and their public offices.

Grants: Research expenses provided mainly by foundations for the purpose of improvement or accomplishment of research.

Specified Contributions: Contributions earmarked for research activities.

Commissioned Research: Research commissioned by government and other public offices, as well as private enterprises.

Joint Research: Collaborative research through personnel exchanges and/or sharing technology/facilities under the joint research agreement, with or without payment of research funds.

Contracts: Research under a contract agreement.

Technical Guidance: Research involving technical guidance such as development of equipment or apparatus.

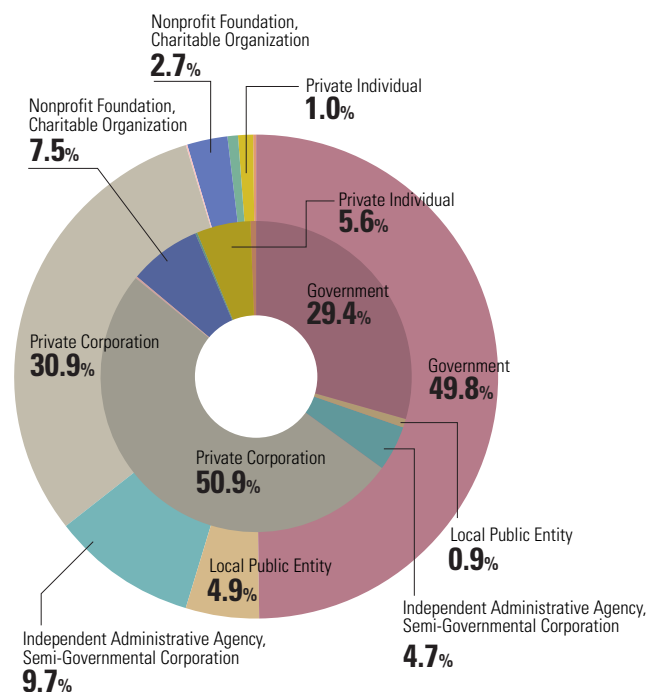
2. Type of External Entity Contributing Research Funds

This category classifies funds by the type of external entity making the contribution. Private corporation account for the largest number of projects while the government account for the largest amount in yen.

*This chart represents the total number of projects and amount in yen excluding the "University Funds" item in "1. Research Funds by Type."

Type of External Entity	Number of Projects	Amount Thousand yen
Government	803	7,528,376
Local Public Entity	24	748,668
Independent Administrative Agency, Semi-Governmental Corporation	128	1,470,643
Private Corporation	1,392	4,677,062
Other University	7	10,699
Nonprofit Foundation, Charitable Organization	204	403,930
Foreign Country	8	90,023
Private Individual	152	151,547
Other	16	46,580
Total	2,734	15,127,528

Contribution Share by External Entity Type
(Amount (outer ring), Number of Projects (inner ring))



3. Research Funds by Campus

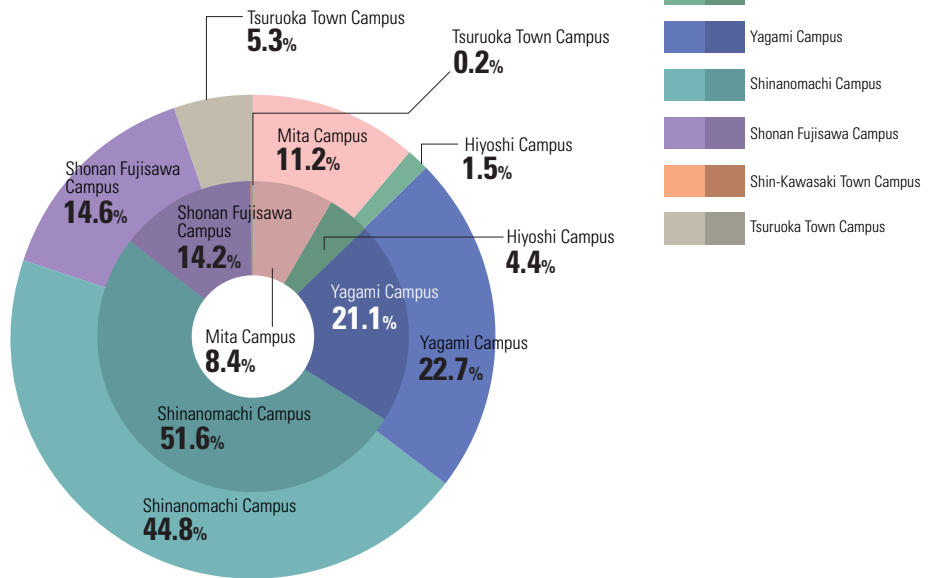
At Keio University, each campus has an Office of Research Administration that manages research funds. Classifying research funds by campus shows that Shinanomachi Campus (home of School / Graduate School of Medicine) accounts for the largest number of projects and the largest amount in yen, followed in both categories by the Yagami Campus (home of the Faculty / Graduate School of Science and Technology).

*The totals are compiled based on the home campus (in principle, the affiliation of the research project representative). However, the actual research may take place at a different campus.

Campus	Number of Projects	Thousand yen
		Amount
Mita Campus	292	1,770,775
Hiyoshi Campus	152	235,735
Yagami Campus	732	3,602,652
Shinanomachi Campus	1,790	7,109,312
Shonan Fujisawa Campus	491	2,320,507
Shin-Kawasaki Town Campus	3	3,170
Tsuruoka Town Campus	8	834,969
Total	3,468	15,877,120

Research Funding Share by Campus

(Amount (outer ring), Number of Projects (inner ring))

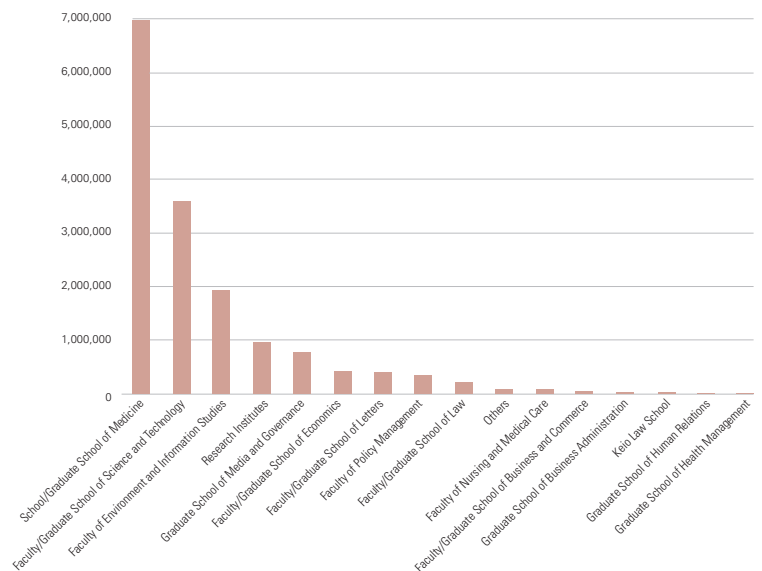


4. Research Funds by Affiliation of Researchers

Classifying funds by affiliation of researcher (in principle, the research representative) shows that the School / Graduate School of Medicine accounts for the largest number of projects and amount in yen, followed by the Faculty / Graduate School of Science and Technology.

Affiliation of Researcher	Number of Projects	Thousand yen
		Amount
Faculty/Graduate School of Letters	122	399,497
Faculty/Graduate School of Economics	109	428,693
Faculty/Graduate School of Law	55	209,521
Faculty/Graduate School of Business and Commerce	57	48,321
School/Graduate School of Medicine	1,765	6,993,934
Faculty/Graduate School of Science and Technology	739	3,604,775
Faculty of Policy Management	167	351,053
Faculty of Environment and Information Studies	252	1,931,416
Faculty of Nursing and Medical Care	32	83,366
Graduate School of Human Relations	1	6,000
Graduate School of Business Administration	18	31,496
Graduate School of Media and Governance	52	708,782
Keio Law School	27	22,904
Graduate School of Health Management	3	2,300
Research Institutes	66	965,474
Others	3	89,588
Total	3,468	15,877,120

Research Funds by Researcher Affiliation (in order of amount)

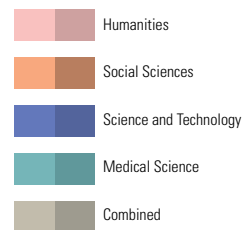
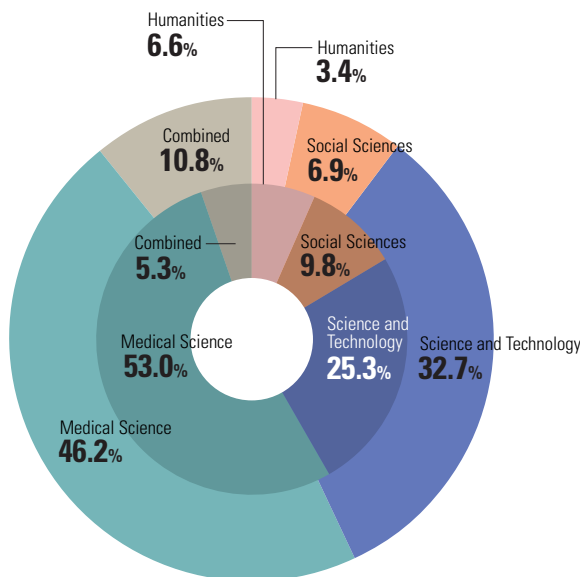


5. Research Funds by Field

Classifying research funds by field shows that medical science accounts for the largest number of projects and the largest amount in yen. The field classifications were derived from the MIC Survey of Research and Development and research expense surveys by the Japan Association of Private Colleges and Universities.

Research Field	Thousand yen	
	Number of Projects	Amount
Humanities	228	541,236
Social Sciences	341	1,099,856
Science and Technology	877	5,184,635
Medical Science	1,838	7,330,701
Combined	184	1,720,692
Total	3,468	15,877,120

Research Funding Share by Field
(Amount (outer ring), Number of Projects (inner ring))



Definition

Humanities:
History, Philosophy, Literature, Languages, and other humanities.

Social Sciences:
Economics, Sociology, Business and Commerce, Political Science, Law, and other social sciences.

Science and Technology:
Applied Chemistry, Chemistry, Mechanics and Shipbuilding, Engineering, Mathematics, Electrics, Communications, Physics, and other science and technology.

Medical Science:
Medicine, Nursing, Pharmaceutical Science, and other health and medical sciences.

Combined:
Interdisciplinary fields.

6. Direct Research Expenses, Indirect Research Expenses, and General Administrative Expenses

Classifying research cost into direct expenses, indirect expenses, and general administrative expenses shows that direct expenses account for 89%, indirect expenses account for less than 5%, and administrative expenses account for 6%.

Definition

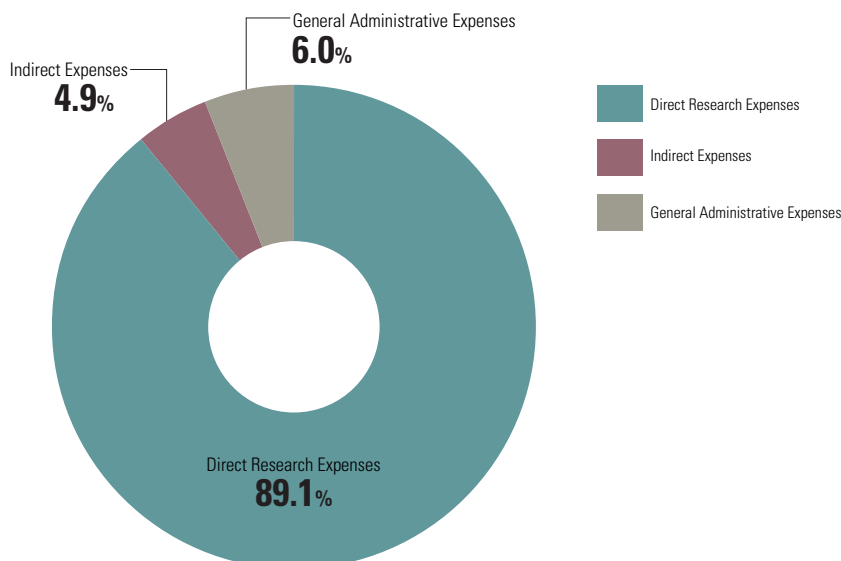
Direct Research Expenses:
For the competitive research funded organization or researcher, this amount covers direct expenses required to conduct research.

Indirect Expenses:
For the competitive research funded organization, this amount (equal to a fixed rate of direct expenses) covers administration and other indirect expenses required to conduct research.

General Administrative Expenses:
For the relevant research organization that uses external funds to conduct research, this amount supplements university operating costs related to the research that are separate from direct research expenses.

Campus	Thousand yen		
	Direct Research Expenses	Indirect Expenses	General Administrative Expenses
Mita Campus	1,617,197	80,903	72,675
Hiyoshi Campus	226,345	2,064	7,326
Yagami Campus	3,158,866	288,782	155,004
Shinanomachi Campus	6,309,397	273,900	526,015
Shonan Fujisawa Campus	2,013,522	127,716	179,269
Shin-Kawasaki Town Campus	2,695	0	475
Tsuruoka Town Campus	814,758	8,370	11,841
Total	14,142,780	781,735	952,605
Total Research Expense	15,877,120		

Direct Research Expenses, Indirect Expenses, General Administrative Expenses



7. Research Fund Data over Past 3 Years

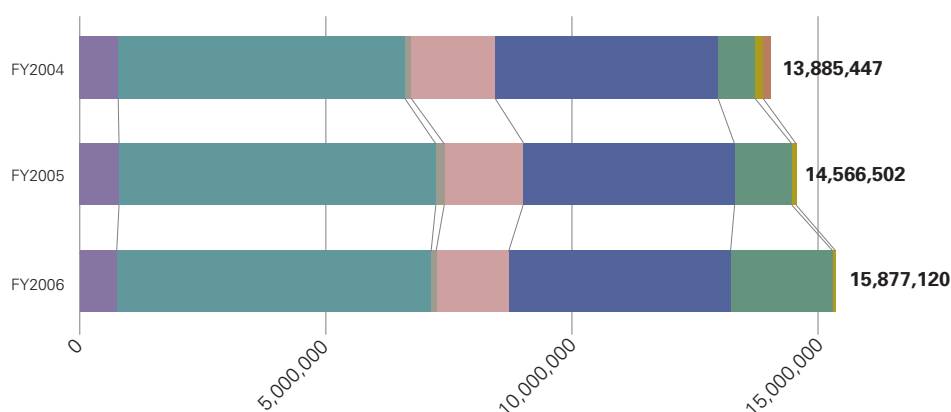
The table shows that research funding over the past three years (FY 2004 to 2006) has been increasing.

Looking at research funds by type reveals a sharp increase in joint research projects. In addition, direct, indirect, and general administrative expenses have also been increasing.

Research Funds by Type over Past 3 Years

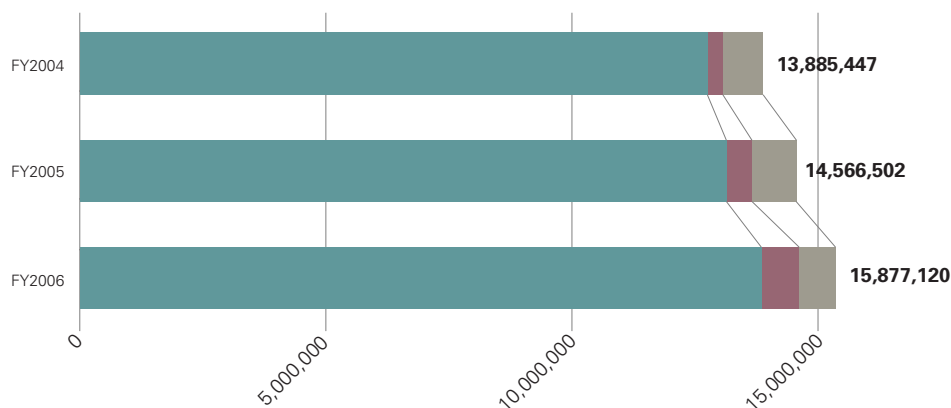
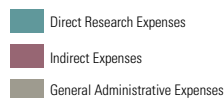
Type of Research Funds	FY 2004	FY 2005	FY 2006
University Funds	761,914	798,164	749,592
Subsidies	5,841,084	6,436,472	6,387,754
Grants	131,297	171,421	104,794
Specified Contributions	1,704,757	1,604,521	2,063,242
Commissioned Research	4,585,094	4,296,684	4,438,734
Joint Research	696,903	1,163,996	2,073,601
Contracts	164,248	88,499	59,403
Technical Guidance	150	6,745	0
Total	13,885,447	14,566,502	15,877,120

* Due to a change in the calculation method, some figures shown here for FY 2004 differ from those found in the "Annual Report on Research Activities 2004-2005."



Direct Research Expenses, Indirect Research Expenses, and General Administrative Expenses over the Past 3 Years

Type of Research Funds	FY 2004	FY 2005	FY 2006
Direct Expenses (Direct Costs)	12,754,240	13,137,388	14,142,780
Indirect Expenses	321,228	529,791	781,735
General Administrative Expenses	809,979	899,323	952,605
Total	13,885,447	14,566,502	15,877,120



Competitive Research Funds

The government's budget for science and technology is increasing every year. However, the 3rd Science and Technology Basic Plan (FY 2006 to 2010) specifies to organizations aiming to become world-class research centers that strategic funds will be given under the principle of competition. Under this policy, competition for research funds among universities is growing more intense every year. In FY 2006, eight government ministries distributed 470.1 billion yen in competitive research funds from the science and technology budget.

One common source of competitive research funds is the MEXT Grants-in-Aid for Scientific Research (*Kakenhi*). The *Kakenhi* budget for FY 2006 was 189.5 billion yen, which is 1.86 times greater than the 1996 budget of 101.8 billion yen. The table under "1) MEXT Grants-in-Aid for Scientific Research" shows rankings by institution from 2004 to 2006 and includes the performance of Keio University.

Another common source of competitive research funds is the Special Coordination Fund for the Promotion of Science and Technology. This policy-encouraged-type competitive research fund is administered by MEXT in accordance with the Council for Science and Technology Policy. In FY 2006, the fund had a budget of 39.8 billion yen, which is 1.85 times greater than the 1996 budget of 21.5 billion yen. Section "2) Special Coordination Fund for the Promotion of Science and Technology" introduces proposals of Keio University in FY 2007 (applied for in FY 2006) adopted under the MEXT program "Creation of Innovation Centers for Advanced Interdisciplinary Research Areas."

Source: Ministry and agency websites

Council for Science and Technology Policy: <http://www8.cao.go.jp/cstp/>
 Ministry of Education, Culture, Sports, Science and Technology (MEXT): <http://www.mext.go.jp/>
 Special Coordination Fund for the Promotion of Science and Technology: <http://www.jst.go.jp/>
 Japan Society for the Promotion of Sciences (JSPS): <http://www.jsps.go.jp/>

1 Grants-in-Aid for Scientific Research (*Kakenhi*)

Kakenhi is designed to remarkably develop any academic research, from basic to applied, in fields ranging from humanities and social sciences to the natural sciences, based on the free thinking of individual researchers. The grants are meant to be provided, after peer review, to innovative and pioneering research projects.

The number of applications submitted in FY 2006 was 116,000 (9,000 less than FY 2005). From this total, 46,000 proposals qualified for research funding (6,000 less than FY 2005).

The table shows the number of *Kakenhi* projects adopted from FY 2004 to 2006 (new and those continuing from the previous year) and the amounts distributed (at the time of selection) of the top 20 institutions. The aggregate of the top 10 accounts for about 42% of the total, and that of the top 20 for about 52%. Keio University was ranked 13th overall and first among private universities.

Kakenhi Distributed by Institution

Rank	FY2004			FY2005			FY2006		
	Institution	Number of Projects	Amount (Million yen)	Institution	Number of Projects	Amount (Million yen)	Institution	Number of Projects	Amount (Million yen)
1	University of Tokyo	2,676	22,101	University of Tokyo	2,750	18,088	University of Tokyo	2,767	16,480
2	Kyoto University	2,031	12,244	Kyoto University	2,170	11,339	Kyoto University	2,255	11,029
3	Osaka University	1,592	9,243	Osaka University	1,627	8,262	Tohoku University	1,819	8,265
4	Tohoku University	1,599	8,475	Tohoku University	1,679	8,079	Osaka University	1,733	7,523
5	Nagoya University	1,079	6,722	Nagoya University	1,212	5,781	Nagoya University	1,216	5,583
6	Kyushu University	1,287	5,415	Hokkaido University	1,312	5,334	Kyushu University	1,432	5,110
7	Hokkaido University	1,183	5,347	Kyushu University	1,347	5,138	Hokkaido University	1,413	5,041
8	Tokyo Institute of Technology	757	4,160	Tokyo Institute of Technology	761	4,278	Tokyo Institute of Technology	763	3,867
9	University of Tsukuba	741	2,611	University of Tsukuba	850	2,760	University of Tsukuba	924	2,774
10	Hiroshima University	842	2,403	Kobe University	735	2,343	RIKEN	530	2,301
11	Keio University	578	2,227	Keio University	585	2,320	Kobe University	752	2,245
12	Kobe University	669	2,216	RIKEN	478	2,312	Hiroshima University	817	2,158
13	RIKEN	437	2,149	Hiroshima University	836	2,245	Keio University	611	1,973
14	Chiba University	538	1,858	Okayama University	600	1,776	Okayama University	625	1,673
15	Okayama University	608	1,695	Tokyo Medical and Dental University	372	1,749	Waseda University	557	1,637
16	Tokyo Medical and Dental University	364	1,494	Chiba University	572	1,698	Tokyo Medical and Dental University	397	1,627
17	Waseda University	460	1,422	Kumamoto University	391	1,448	Chiba University	587	1,508
18	National Institute of Genetics	71	1,422	Waseda University	503	1,409	Kanazawa University	493	1,279
19	Kumamoto University	348	1,241	Kanazawa University	450	1,277	Kumamoto University	404	1,256
20	Tokyo Metropolitan University	266	1,151	Niigata University	489	1,227	University of Tokushima	399	1,094
A			155,051			158,892			161,188
B			78,721			71,402			67,973
B/A			51%			45%			42%
C			95,596			88,863			84,423
C/A			62%			56%			52%

A Total amount distributed (research expenses) B Total of top 10 institutions C Total of top 20 institutions

Source: Japan Society for the Promotion of Science, <http://www.jsps.go.jp/j-grantsinaid/>

* Data here is classified by the research institution with which the research representative is affiliated; it may not reflect the overall ranking by institution because funded research activities are often conducted with co-researchers whose affiliation differs from that of the representative.

2 Special Coordination Fund for the Promotion of Science and Technology

The FY 2006 Special Coordination Fund for the Promotion of Science and Technology has focused efforts on 1) strengthening the control function of the Council for Science and Technology Policy, 2) reforming the science and technology system to stimulate creativity and innovation, 3) advancing strategic R&D for the needs of the nation, and 4) promoting science and technology as an internationally strategic activity. Source: "Basic Policy Report on Science and Technology" and "FY 2006 Basic Approach to Special Coordination Fund for the Promotion of Science and Technology" by the Council for Science and Technology Policy (12/27/2005).

Fiscal year 2006 also marked a transition from the second to the third Science and Technology Basic Plan, along with major concomitant reforms. New programs underway include "Promotion of Environmental Improvement for Independence of Young Researchers," "Creation of Innovation Centers for Advanced Interdisciplinary Research Areas," "Support Model for Development of Women Researchers," "Human Resource Development System for the Revitalization of Regional Industry and Society," and "Strategic Promotion of Science and Technology in Asia."

The proposal by Keio University entitled "Creating a Co-mobility Society" has been selected by MEXT to receive initial funding for the FY 2007 "Creation of Innovation Centers for Advanced Interdisciplinary Research Areas" program (application period: 12/25/2006 to 02/19/2007). Of a total of 26 proposal applications submitted to MEXT from organizations nationwide, nine were selected; Keio University was the only private university to have its theme selected.

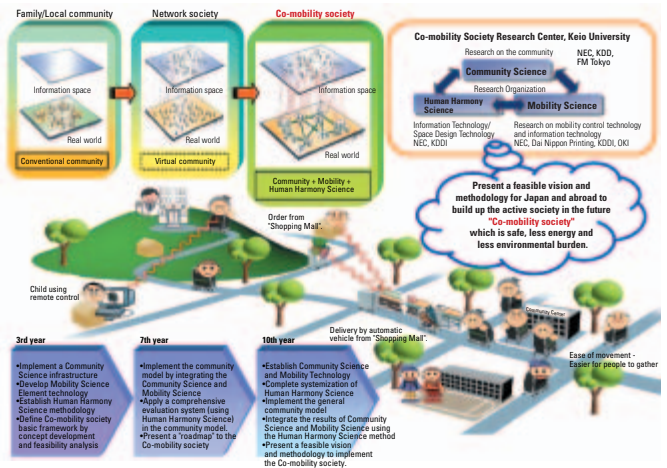
This program was established under the FY 2006 Science and Technology Basic Plan (third term) as a scheme to form research and education centers based on large-scale competitive research funds. These funds are targeted to promotion of innovation in areas of advanced and important interdisciplinary research, through the cooperation of industry, academia, and government. The aims of the program are two-fold; firstly to provide a solid and most advanced environment for junior researchers, and secondly to form a R&D location that will produce future applications in industry, science and society. The total research period is 10 years, with the provision that there will be assessments after three and seven years to determine whether the research merits a further continuation.

The aim of Keio's project is to create new, multi-faceted communities based on the convergence of real living space and information spaces, and a new type of mobility systems to provide easier access in the real space. What we call the "Co-mobility Society" refers to a comfortable, safe and creative living and communication space in which all people —young and old alike— would be able to live and communicate with each other. So far, community research has been limited to either a small scale local

communities, or virtual communities existing only on networks. Many of the traditional regional communities have disappeared and what remain lacks adequate access to information and to transportation means. The "Co-mobility Society" combines advanced information systems support with new information controlled mobility system to form a new and multi-faceted community mode that will provide practical solutions for improving various difficulties and problems of daily life, for instance, in education, care for the elderly.

A salient feature of this project is that it is carried out by a partnership by Keio University and by companies who are leaders in information, telecommunications, broadcasting and mobile technology. Participants from industry include KDDI Corporation, NEC Corporation, Oki Electric Industry Co., Ltd., Dai Nippon Printing Co., Ltd, and Tokyo FM Broadcasting Co., Ltd. The new "Co-mobility Society Research Center" has opened its door on Shin Kawasaki Town Campus. The Center, with cooperation by these leading companies and by the Graduate School of Science and Technology, the Graduate School of Media and Governance, the Faculty of Business and Commerce, the Faculty of Letters among others, is committed to the successful and truly interdisciplinary effort to promote the project.

Selected Theme: Creating the "Co-mobility Society"



2007 Inauguration Meeting for the Co-mobility Society Research Center



Opening comments by University President Anzai



Director Kawashima, Co-mobility Society Research Center



Explanation of program partners



Vice President Murai (foreground) and Professor Kaneko (background) speaking with corporate researchers

Main Researchers and Areas of Responsibility for "Creating a Co-mobility Society" Project

Managing Director	University President Yuichiro Anzai
Community Sciences	
Community model formation with high social capital	Graduate School of Media and Governance Professor Ikuyo Kaneko
Mobility Sciences	
Development of mobile systems	Professor Shimizu, Faculty of Environment and Information Studies
Development of automotive technology	Graduate School of Media and Governance Associate Professor Manabu Omae
Development of fundamental technologies for time-space information systems	Vice President Jun Murai
Human Harmonics Sciences	
Driving simulator evaluation	Professor Hironao Kawashima, Faculty of Science and Technology (Director, Co-mobility Society Research Center)
Designing community spaces and information spaces	Professor Kengo Kuma Faculty of Science and Technology
Evaluating environmental resources and creating sustainable communities	Professor Haruki Sato, Faculty of Science and Technology

In addition to the above themes selected for the "FY 2007 Special Coordination Fund for the Promotion of Science and Technology," Keio University had two more themes selected, one by the "Asia S&T Strategic Cooperation Promotion" program and one by the "Promotion of Versatile Response to Important Policy Themes" program.

Theme selected under the "Asia S&T Strategic Cooperation Promotion" program "Development of Environmental Resources Management Technology for Sustainable Use of Biomass"

Research Representative: Professor Masataka Watanabe, Faculty of Environment and Information Studies

Joint Research Organizations: Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Science; Institute of Agricultural Policy, Chinese Academy of Science

Theme selected under the "Promotion of Versatile Responses to Important Policy Themes" program "Development of Systematic Assessment of Kambo Antioxidant Capacity for the Prevention of Arteriosclerosis and Brain Aging"

Research Representative: Associate Professor Kenji Watanabe, Department of Kambo Medicine, School of Medicine

Researchers at Keio University in FY2006

This section presents data from FY 2006 on researchers involved in research and education at Keio University (professors, associate professors, assistant professors and instructors), doctoral students and awardees of doctor's degrees, and researchers participating in research projects at Keio but not affiliated under the any of above conditions.

1 Number of Researchers

"Tenured researchers" are those employed under full-time contracts without fixed terms. "Researchers with fixed period contract" are either full-time or part-time. Of those with fixed period contracts, "special research professors" are paid by research funds allocated from outside Keio University as a condition of appointment.

"Researchers" in the following data only include researchers in the University (Professors, Associate Professors, Assistant Professors and Instructors) and excludes teachers at affiliated elementary and secondary schools of Keio University.

In contrast to Mita and Hiyoshi campuses, there are more researchers funded by external research sources at the Yagami, Shinanomachi, and Shonan Fujisawa campuses. The number of the non-tenured researchers (that is, the total number of researchers with fixed period contracts and special research professors) accounts for 23% overall, but is a striking 52% at Shonan Fujisawa Campus.

Campus	Number of people			
	Tenured Researchers	Researchers with Fixed Period Contract	Special Research Professors	Total
Mita	364	36	58	458
Hiyoshi	291	21	4	316
Yagami	243	18	36	297
Shinanomachi	597	8	152	757
Shonan Fujisawa	134	42	102	278
Total	1,629	125	305	2,106

As of 1 May 2006

2 Support for Future Researchers

There are two types of doctor's degrees: course and dissertation doctorates. Course doctorates are conferred upon completion of course work with all other requirements. Dissertation doctorates are conferred on those who have submitted a dissertation with consent of a committee of a graduate school, and passed the examination by a board of review.

The standard period for completion of a doctoral course is three years, except for the Graduate School of Medicine, which maintains a four year standard.

Number of Doctorates Awarded

	Number of people
Course Doctorate	
Graduate School of Letters	9
Graduate School of Economics	1
Graduate School of Law	12
Graduate School of Human Relations	6
Graduate School of Business and Commerce	6
Graduate School of Medicine	25
Graduate School of Science and Technology	77
Graduate School of Business Administration	2
Graduate School of Media and Governance	23
Subtotal	161
Dissertation Doctorate	
Graduate School of Letters	12
Graduate School of Economics	2
Graduate School of Law	5
Graduate School of Human Relations	3
Graduate School of Business and Commerce	1
Graduate School of Medicine	67
Graduate School of Science and Technology	12
Graduate School of Business Administration	0
Graduate School of Media and Governance	5
Subtotal	107
Total	268

As of 31 March 2007

Number of Students Registered in Doctoral Courses

		Number of people
Graduate School of Letters	< 45 >	130
Graduate School of Economics	< 15 >	60
Graduate School of Law	< 30 >	101
Graduate School of Human Relations	< 11 >	54
Graduate School of Business and Commerce	< 20 >	47
Graduate School of Medicine *	< 68 >	195
Graduate School of Science and Technology	< 150 >	350
Graduate School of Business Administration	< 8 >	10
Graduate School of Media and Governance	< 50 >	170
Total		1,117

As of 1 May 2006

Figures in parentheses indicate the maximum number of entrants for the graduate school.

* The figure for the Graduate School of Medicine refers to the number of students registered in doctoral courses.

3 Researchers from Outside Keio

Keio University has long emphasized the creation of an environment conducive for intellectual exchange and synergistic cooperation with researchers both within and outside the institution, with the goal of sharing common or related research subject.

Not only undergraduate faculty/graduate school but also research institutes of Keio University accept researchers from other research institutions and universities.

Number of Researchers Accepted—Breakdown by Job Title and Status

Job Title/Status of Researchers	Number of Researchers	Qualifications	Number of people
Research Associates of Faculty of Science and Technology (Yagami)	55	Researchers participating in research without a contract of commissioned research.	
Researchers of Keio Leading-edge Laboratory of Science and Technology (KLL) (Yagami)	185	Researchers participating in research under a commissioned research contract.	
School of Medicine Researcher (Shinanomachi)	240	Researchers employed by research, educational, or medical institutions other than the School of Medicine of Keio University.	
Senior Visiting Researchers, Keio Research Institute at SFC (Shonan Fujisawa)	272	Researchers accepted by Keio Research Institute at SFC upon application from an institution not affiliated with Keio University, or that from the applicant him/herself. Applicants must have a master's degree or qualified as equivalent having experience and achievements as an independent researcher.	
Visiting Researchers, Keio Research Institute at SFC (Shonan Fujisawa)	111	Researchers accepted by Keio Research Institute at SFC upon application from an institution not affiliated with Keio University or from the applicant him/herself. Applicants must have a bachelor's degree or qualified as equivalent having experience and achievements as an independent researcher.	
Visiting Professors and Researchers *1 (See Table A)	351		
Others (See Table B)	1,166		
Total	2,380		

Table A: Visiting Professors and Researchers

Job Title, Status	Mita/Hiyoshi	Yagami	Shinanomachi	Shonan Fujisawa	Total	Number of people
Visiting Professor	32	34	20	1	87	
Visiting Associate Professor	8	10	13	0	31	
Visiting Lecturer	3	7	8	0	18	
Visiting Research Fellow	51	67	77	0	195	
Visiting Research Associate	12	8	0	0	20	
Total	106	126	118	1	351	

Table B: Others

Research Institute	No. of Researchers at Keio University*2	No. of Researchers not Employed by Keio	Total	Number of people
Institute of Cultural and Linguistic Studies (Mita)	30	35	65	
Institute for Media and Communications Research (Mita)	11	44	55	
Keio Economic Observatory (Mita)	32	32	64	
<i>Shido Bunko</i> , Institute of Oriental Classics (Mita)	9	1	10	
International Center (Mita)	67	27	94	
Teacher Training Center (Mita)	39	49	88	
Fukuzawa Memorial Center for Modern Japanese Studies (Mita)	24	39	63	
Institute of East Asian Studies (Mita)	24	41	65	
Center for Japanese Studies (Mita)	13	38	51	
Research Center for the Arts and Arts Administration (Mita)	18	16	34	
Global Security Research Institute (G-SEC) (Mita)	60	37	97	
Research Institute for Digital Media and Content (DMC) (Mita)	90	32	122	
Institute of Physical Education (Hiyoshi)	20	38	58	
Health Center (Hiyoshi)	16	1	17	
Keio Research Center for Foreign Language Education (Hiyoshi)	49	9	58	
Sports Medicine Research Center (Hiyoshi)	9	9	18	
Keio Research Center for the Liberal Arts (Hiyoshi)	200	7	207	
Total	711	455	1,166	

Figures show the totals for FY2006. Place names in parentheses indicate location of the institution.

*1 Generic designation used for visiting professor, visiting associate professor, visiting lecturer, visiting research fellow and visiting research associate. (Excludes researchers at Keio listed in Table B).

*2 Researchers at Keio University: the figure indicates total number of researchers including teachers in the affiliated elementary and secondary schools of Keio, in addition to tenured and non-tenured researchers of undergraduate faculties/graduate schools or research institutes. A researcher affiliated to more than two institutions is counted as one researcher of each.

Technology Transfer: Activities at the Intellectual Property Center

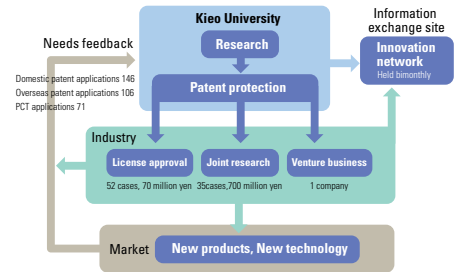
Knowledge created at the university is returned to society through the traditional vehicles of education and academic presentation. In recent years, universities across Japan have been firmly establishing a third vehicle of return, that is, the conversion of research results into commercial products and technologies.

In an environment of intense global competition, the enterprise development structure is becoming more selective and focused. At the same time, the third vehicle of return and the solutions in advanced research fields that contribute to future commercial applications both fall in synch with industry's expectations towards universities.

To promote industry-academia collaboration and to systematically develop new business opportunities through the creation of intellectual value, Keio University established the Intellectual Property Center in 1998. This center helps researchers protect their research results as intellectual property rights. These IP rights, in turn, can be used to promote technology transfer through license approval, joint or commissioned research, and the establishment of venture business.

Through high research standards and furtive support for researchers, countless invention proposals have sprung from the campuses of Keio University. Indeed, over the past 10 years, the center has become a remarkable catalyst in the cycle of technology transfer.

To develop activities even further, the Intellectual Property Center is deepening collaboration from an international perspective between Keio University and industry. An industry feedback system has been established to stimulate researchers and to crystallize efforts towards commercial applications. Opportunities to interact with the world of business are enhancing the dynamism of Keio University.

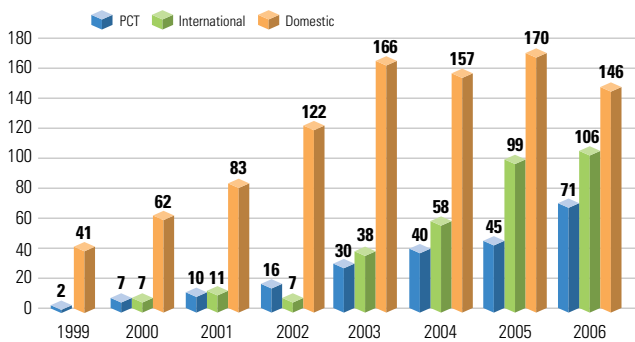


These IP rights, in turn, can be used to promote technology transfer through license approval, joint or commissioned research, and the establishment of venture business.

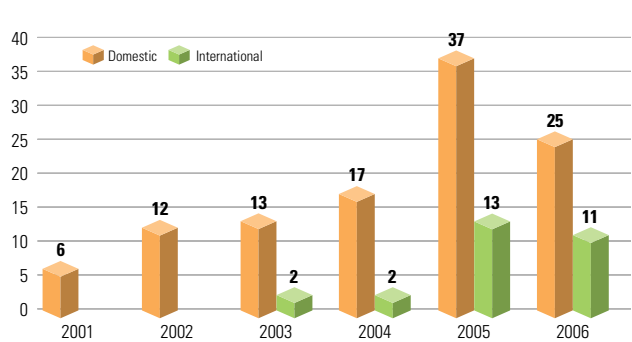
1 Intellectual Property

In FY 2006, the IPC continued to engage in vigorous patent application activity with 146 domestic patent applications, 71 PCT applications, and 106 overseas patent applications. The center also registered 25 domestic patents and 11 overseas patents.

(1) Patent Applications



(2) Registered Patents



(3) Proportion of Applications by Field of Technology (2006)

Bio/ Medical	46%
Information/ Communication	23%
Control/ Measurement	20%
Materials/ Chemicals	11%

(4) Number of Applications by Campus (2006)

Yagami (Faculty of Science and Technology)	93
Shinanomachi (School of Medicine)	46
SFC	7
Mita	0

(5) Total Patent Applications by Inventor (2006)

Professor	78	Associate Professor	37
Lecturer	14	Instructor/Assistant	7
Student	3	Staff members	3
Other	4		

* Each year, over 20% of the new proposals are submitted by new inventors, which achieves a healthy and steady turnover of new faces.

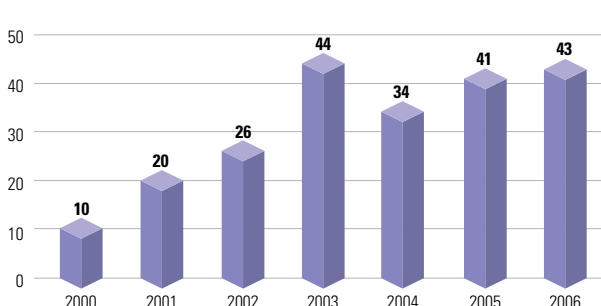
2 Technology Transfer

The IPC technology transfer officer ensures the smooth transfer of technology from university to industry.

Technology transfers are conducted in the following three forms:

- (I) Licensing of Keio University's intellectual property to companies
- (II) Joint research with companies based on Keio University's intellectual property
- (III) Creation of joint venture companies based on Keio University's intellectual property, and continuation of development activities in that company

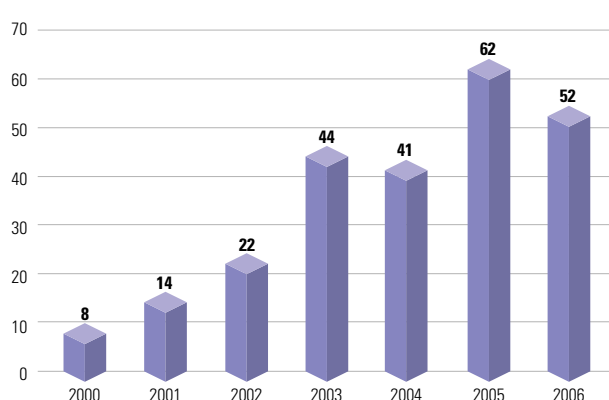
(2) Number of New Licensing Agreements

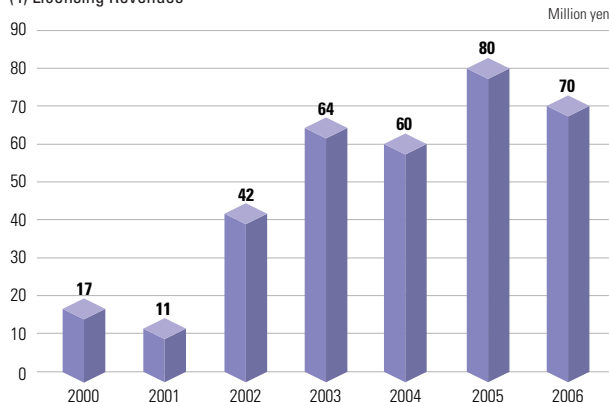


(1) Licensing IP to Enterprise

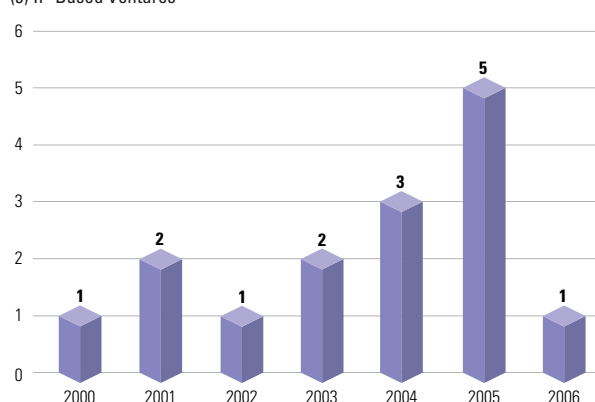
In FY 2006, the IPC made 43 licensing agreements with companies. Total license income in 2006 from current and past agreements was 70.25 million yen. The aggregate total of license income since establishment is 350 million yen.

(3) Income-Generating Licenses



(4) Licensing Revenues**(6) Joint research started based on intellectual property, and research funds obtained**

The Intellectual Property Center promotes joint research with private enterprises and actively strives to acquire public research funds from sources like the "Grant for Practical Application of University R&D Results under the Matching Fund Method" (NEDO) and the "Seeds Cultivation Experiment" (JST).

(5) IP-Based Ventures

In FY 2006, 35 projects based on Keio intellectual property obtained 700 million yen in joint research funds. Matching funds accounted for 590 million of this total.

In FY 2006, one venture based on Keio IP was launched: Articell Systems Corporation. Thus far a total of 15 companies have been established, with Keio University holding an equity stake in 11 of them.

3 Platform for Information Exchange between Industry and Academia

Through the transfer of intellectual property and technologies, in addition to adding further vitality to collaborations between industry and academia, the Intellectual Property Center strengthens information exchanges between industry and academia and actively promotes the blending of knowledge.

(1) Keio Innovation Network (at Mita Campus G-SEC)

Held on May 24	"System for enabling Internet-based home-care information sharing between organizations"	Eiko Uchiyama	Assistant Professor (Non-tenured), Graduate School of Media and Governance
	"Development of a prosthetic device and clinical applications to enable a hemiplegic patient to walk again"	Kitataka Hase	Associate Professor, School of Medicine
Held on June 27	"Advanced and high throughput gene expression detection: Whole mount in situ gene amplification"	Motoyuki Ogawa	Instructor, School of Medicine
	"Development of new in vitro selection method for investigating receptor ligands"	Nobuhide Doi	Assistant Professor, Faculty of Science and Technology
Held on July 26	"Ultra high speed SEM specimen preprocessing method and application example"	Kenichi Shimizu	Professor, University Chemical Laboratory, Faculty of Economics
	"Micro and nano-scale thermal physical sensing and the possibility of a wide range of applications"	Yuji Nagasaka	Professor, Faculty of Science and Technology
Held on September 27	"A thought of people solved on the Internet.: Development of "Textlimi" for text meaning space analysis"	Masahiro Fukaya	Professor, Faculty of Policy Management
	"Development and application of color-changing fiber "Fabcell""	Akira Wakita	Assistant Professor, Faculty of Environment and Information Studies
Held on November 6	"Development of new preventive therapies against severe infectious disease and inflammatory lung disease"	Seitaro Fujishima	Assistant Professor, School of Medicine
	"Development of cancer therapy drugs from RNA interference that targets activated cancer genes"	Hidetoshi Sumimoto	Instructor, School of Medicine
Held on November 30	"From Keio to the world: New concepts in silicon semiconductor devices to support a country based on electronics"	Kohei Itoh	Associate Professor, Faculty of Science and Technology
	"The world of ultra high speed: Surface defect imaging of semiconductor materials based on super-fast femtosecond laser measurement"	Fumihiko Kannari	Professor, Faculty of Science and Technology

(2) Venture Private Conference (at Mita Campus G-SEC)

Held on June 6/7 and December 21/22 Executives from venture companies introduce business strategies and discuss future developments.

4 Symposiums

(1) The 1st Intellectual Property Center Symposium

(06/07/06, 8th Fl., East Bldg. Hall, Mita Campus)

"The Future of Venture-Created Japan"

Lecturers, panelists:

Dr. Masao Horiba, Supreme Advisor, Horiba, Ltd.

Tomoko Namba, President, DeNA Co., Ltd.

Hiroshi Hoshi, President, Propia K.K.

Kazutaka Muraguchi, General Partner, Nippon Technology Venture Partners Operation Union

Keisuke Shimizu, Director, Intellectual Property Center, Keio University

(2) The 2nd Intellectual Property Center Symposium

(03/2000, Rm. 133, First School Bldg., Mita Campus)

Emerging Businesses in the Changing World of Patents

Lecturers, panelists:

Hisamitsu Arai, former Secretary-General, Intellectual Property Strategy Headquarters

Hiroaki Masuyama, President, Intellectual Property Bank Corporation

Yoshihide Nakamura, President, ULDAGE Inc.

Keisuke Shimizu, Director, Intellectual Property Center, Keio University

(3) Kanto-Kansai University-Industry Collaboration Forum

(12/19/06, Main Lecture Hall, Nihon University)

Keio and nine other universities* jointly held the "Kanto-Kansai Industry-University Collaboration Forum."

*Chuo University, Tokyo Denki University, Nihon University, Meiji University, Waseda University, Kansai University, Kwansai Gakuin University, Doshisha University, and Ritsumeikan University.

• Keynote lecture: "Enhancing Innovation Capability and Developing Human Resources," by Ayao Tsuge, Member, Council for Science and Technology Policy, Cabinet Office

• Research presentation meeting: New research solution announcements by each university

5. Intellectual Property Center Award/Education

(1) Intellectual Property Center Award

The annual Intellectual Property Award was established in 2000 to spread the word of center activities throughout Keio University and to communicate new initiatives to society. The seventh award was given to Associate Professor Hiroshi Hirose (Health Center) for intellectual property related to "diagnosis of saccharometabolic disorder" (Patent No. 3624216, International)

(2) Introduction to Intellectual Property

To provide education in intellectual property, each year the Mita Campus sponsors a course entitled "Introduction to Intellectual Property" while the Yagami Campus has course entitled "Topics in Intellectual Ownership."

(3) Human Resource Development for Supporting International Industry-University Collaboration

As a part of activities for "University Intellectual Property Headquarters Development Projects" (MEXT), Keio sponsors a four-session training workshop on the development of human resources for supporting international industry-university collaboration.

December 14

"Joint Business Framework for Silicon Valley-University Collaboration"

Sean O'Conner, University of Washington

"Bayh-Dole System and Protection of Upstream Inventions"

Professor Toshiko Takenaka, University of Washington

January 24

"Principle Provisions for International Licensing Agreements and Joint Research Agreement Negotiations"

Torahiko Maki, Executive, Tsukishima Kikai Co., Ltd.

From Jan 30 to Feb 1

"Industry-University Collaboration System in US, Intellectual Property, Technology Transfer, Research Agreements, and Start-ups"

Clark C. Shoros, University of Washington

Charles R. Williams, University of Washington

Dana Bostrom, UC Berkeley

February 28

"Uniformity Problem in US Patent Law" US Court of Appeals for the Federal Circuit (CAFC)

Judge Randall R. Rader,

Professor Toshiko Takenaka, University of Washington

Awards for Research Activities, FY2006

Source: Keio Gijyuku Ho (Keio Biweekly Newsletter) and Keio University homepage. Entries arranged by date of award.

Date Awarded (YY/MM/DD)	Recipient (s)	Award	Reason for Award	Awarding Institution
2006/04/18	Hideyuki Okano (Professor, School of Medicine)	The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology Prizes for Science and Technology (Research Category)	For outstanding contributions to the development of science and technology in Japan through "Research on the regeneration of the central nervous system based on the stem-cell system"	Minister of Education, Culture, Sports, Science, and Technology
2006/04/22	Takashi Maeno (Professor, Faculty of Science and Technology)	Funai Award for Advancement of Information Sciences	For clarification of tactile information perception mechanism in humans and research of normative tactile sensing in humans	Funai Foundation for Information Technology
2006/05/16	Shuzo Murakami (Professor, Faculty of Science and Technology) and others	SHASEJ Award Distinguished Paper Award	For a series of outstanding papers on "Research related to hybrid air-conditioning systems that combine natural ventilation in the office"	The Society of Heating, Air-Conditioning and Sanitary Engineers of Japan
2006/05/16	Shuzo Murakami (Professor, Faculty of Science and Technology) and others	SHASEJ Award Distinguished Paper Award	For a series entitled "Development of radiation heat transfer methods for convection & radiation coupled simulation in large-scale and complex configurations"	The Society of Heating, Air-Conditioning and Sanitary Engineers of Japan
2006/05/31	Hiroyuki Tsuda (Associate Professor, Faculty of Science and Technology) and others	ELEX 2005 Best Paper Award	For the compact and low-cost dispersion compensating devices based on technology described in "Planar lightwave circuit dispersion compensator using a compact arrowhead arrayed-waveguide grating" that is expected to contribute greatly to future development in photonic networks.	IEICE Electronics Society
2006/06	Ichiro Inasaki (Headmaster & Professor, Faculty of Science and Technology) and others	IMEchE 2005 Best Paper Award	"Investigation of adsorption behaviour of lubricants in near dry machining," proceeding of the Institution of Mechanical Engineers, Vol. 219, No.9, 2005	Institution of Mechanical Engineers
2006/06/03	Aeka Ishihara (Associate Professor, Faculty of Business and Commerce)	3rd Japan-Germany Literary Society Award (German Language Paper Division)	For work entitled "Von der Skala der Natur zum evolutionaeren Vektor. Der Zwischenkieferknochen und das Affen-Motiv in der Literatur der Goethe-Zeit," Neue Beitrage zur Germaistik Band 3 / Heft3 , pp144-158, 2004	Japan-Germany Literary Society
2006/06/12	Eiji Hosoda (Professor, Faculty of Economics)	Lifetime Achievement Award in Environmental Preservation, Ministry of the Environment	For numerous achievements and works such as "The Economics of Goods and Bads: Basic Principles of a Recyclable Society," (Toyo Keizai, Inc., 1999); and for 1) the popularization of basic principles towards a sustainable economic society, 2) the creation of international resource circulation systems, and 3) the development of methods to process waste and recycle packaging for a sustainable society	Ministry of the Environment
2006/07/20	Wataru Kakegawa (Instructor, School of Medicine)	2006 Japan Neuroscience Society Young Investigator Award	For work entitled "Study on physiological roles and trafficking mechanisms of glutamate receptors that regulate synaptic functions."	Japan Neuroscience Society
2006/08/01	Norio Hibiki (Associate Professor, Faculty of Science and Technology) and others	Harold Skipper Best Paper Award for Global Insurance, The Tenth Annual Conference of the Asia-Pacific Risk and Insurance Association	For work entitled "Dynamic financial planning for a household in a multi-period optimization approach"	Asia-Pacific Risk and Insurance Association
2006/08/22	Kouhei Ohnishi (Professor, Faculty of Science and Technology)	IEEJ Industry Applications Society Distinguished Service Award	For active contributions over many years in the IEEJ Industrial Applications Society	The Institute of Electrical Engineers of Japan (IEEJ)
2006/09/09	Norio Hibiki (Associate Professor, Faculty of Science and Technology) and others	JASFP Outstanding Paper Award	For work entitled "Household asset formation using multi-period optimization model"	Japan Academic Society for Financial Planning
2006/09/14	Tetsuhiko Isobe (Associate Professor, Faculty of Science and Technology) and others	IUMRS-ICA 2006 Best Paper Award	For work entitled "Photoluminescence of the Highiy Transparent Colloidal Solution of LaPO ₄ : Ce ³⁺ , Tb ³⁺ Nanocrystal Phosphors Synthesized by Low-Temperature Solvothermal Method: Effect of Polyphosphate Additive"	The International Union Materials Research Society -International Conference in Asia 2006 (IUMRS-ICA 2006)
2006/09/19	ToshiHisa Ueda (Professor, Faculty of Science and Technology)	JSME Achievement Award, Thermal Engineering Division, Thermal Engineering Achievement Award	For achievements in thermal engineering research on such as clarification of complexity and chaos phenomena in thermal and fluid dynamics for reactive systems	Japan Society of Mechanical Engineers
2006/10/08	Yoshihiro Taguchi (Instructor, Faculty of Science and Technology)	JSTP Award for Young Scientists	For Development of novel nano-scale thermophysical properties measurement technique using near-field optics for achieving superior spatial resolution beyond the diffraction limit of light.	Japan Society for Thermophysical Properties
2006/10/19	Masaki Kitashima (Professor, School of Medicine)	Komei Nakayama Award	Progress in the treatment of gastric cancer in the aspect of minimally invasiveness and individualization	Japan Society of Clinical Oncology
2006/10/28	Hirofumi Ueda (Professor, Faculty of Economics)	1st PEEHS Awards	For work entitled "Subcontracting during Wartime Japan: Small Businesses and Subcontracting as an Industrial Policy," MINERVA Modern Economics Series, 2004	Political Economy & Economic History Society
2006/10/28	Jaedong Choi (Associate Professor, Faculty of Economics)	The 2006 Political Economy and Economic History Society Prize	For series entitled "Stolypin Agrarian Reforms in Russia: Private Property, Joint Property, and Household Division," History and Economics, Vol. 178, 2003/01	Political Economy & Economic History Society

Date Awarded (YY/MM/DD)	Recipient (s)	Award	Reason for Award	Awarding Institution
2006/11/01	Takashi Maeno (Professor, Faculty of Science and Technology) and others	JSAEM Best Book Award	For book entitled "Actuator Engineering," Yokendo, 2004	The Japan Society of Applied Electromagnetics and Mechanics
2006/11/03	Yasuhiro Koike (Professor, Faculty of Science and Technology)	Medal with Purple Ribbon	For achievements in polymer chemistry research focusing on photonic polymers	Japanese Government
2006/11/06	Takanobu Nakajima (Professor, Faculty of Business and Commerce)	49th Nikkei Prize for Excellent Books in Economic Science	For book entitled "The Economics of Disability," Toyo Keizai, Inc., 2006	Japan Center for Economic Research, Nihon Keizai Shimbun, Inc.
2006/11/11	Norihisa Miki (Assistant Professor, Faculty of Science and Technology)	Best Poster Presenter		6th Japan-America Frontiers of Engineering Symposium
2006/11/14	Akiko Matsuo (Associate Professor, Faculty of Science and Technology)	10th JWAA Women's Award	For research activities in aeronautical engineering	Japan Women's Association of Aviation
2006/11/21	Kohei Itoh (Associate Professor, Faculty of Science and Technology)	20th Japan IBM Science Award	For work entitled "Development of Si and Ge isotope engineering for new electronic applications"	Japan IBM
2006/11/28	Kenji Yasuoka (Associate Professor, Faculty of Science and Technology)	MSSJ Award	For excellent research results in large-scale molecular simulation of microscopic mechanism related to fluid interfaces and nucleation phenomena	Molecular Simulation Society of Japan
2006/12/12	Masayuki Amagai (Professor, School of Medicine)	9th JSI Award	For big contributions in basic immunology and clinical immunology through continuous and consistent research over the years in autoimmune diseases	Japan Society for Immunology
2007/01/12	Toshihiko Oka (Instructor, Faculty of Science and Technology)	11th JSSR Scientific Award	For extremely important work in synchrotron radiation science related to the "Photoreaction of purple membrane through time-resolved x-ray diffraction" that is expected to contribute greatly to future development in this field	Japanese Society for Synchrotron Radiation Research
2007/03/02	Aeka Ishihara (Associate Professor, Faculty of Business and Commerce)	3rd JSPS Prize	For book entitled "Goethe's 'Buch der Natur:' Reception of Natural Sciences in German Literature during the 18th & 19th Centuries	Japan Society for the Promotion of Sciences
2007/03/02	Aeka Ishihara (Associate Professor, Faculty of Business and Commerce)	The Japan Academy Medal	For book entitled "Goethe's 'Buch der Natur:' Reception of Natural Sciences in German Literature during the 18th & 19th Centuries	The Japan Academy
2007/03/02	Kazunobu Sawamoto (Associate Professor, School of Medicine)	3rd JSPS Prize	For work entitled "Cellular proliferation, differentiation and migration in neural development and regeneration".	Japan Society for the Promotion of Sciences
2007/03/20	Hideki Tsuge (Professor, Faculty of Science and Technology)	SCEJ Award	For work entitled "Research to clarify of bubble characteristics and develop related engineering applications	The Society for Chemical Engineerings, Japan

Index

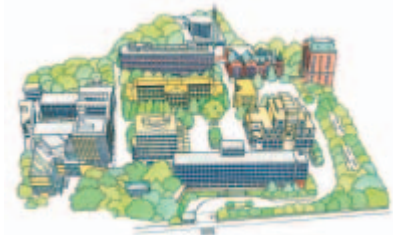
Center for Integrated Medical Research	3, 11, 12, 24, 32	Innovation Centers for Advanced Interdisciplinary Research Areas	37, 38	Post-doctoral fellow (PD)	27, 30
Center for Research Promotion(CRP)	2-4, 21-23, 46	Intellectual Property Center	2-4, 9, 41, 42, 46	Program to Encourage the Development of	
Clinical Research Center	11, 22	International exchange, International collaboration		Strategic Research Centers	19, 33
Commissioned research, commissioned research contract			5, 6, 8, 19, 24-26, 28, 30	Research assistant (RA) (COE researcher)	20, 24, 26-28, 30
	3, 9, 10, 12-14, 33, 36, 40, 41	Joint research	3-9, 12-15, 17, 18, 21-30, 33, 36, 38, 40-42	Researcher	6, 7, 9, 15, 20, 23, 25, 26, 28, 40, 41
Comprehensive collaboration	22, 30	Keio Advanced Research Centers (KARC)	3, 4, 9, 24, 30, 46	Researcher, tenured	5, 6, 15, 21, 39, 40
Competitive research fund	2, 21, 24, 35, 37	Keio Leading-edge Laboratory of Science and Technology (KLL)	3, 4, 9, 10, 22, 23, 32, 40	Researcher with fixed period contract	21, 39, 40
Consortium	13, 14	Keio Research Center at SFC	3, 4, 13, 14, 40	Research Park	11, 12, 24, 32
Contracts	33, 36	Keio Researchers Information System (K-RIS)	4	SFC Open Research Forum	4, 13, 28
Course doctorate	39	Keio Techno-Mall	4, 9, 10	Special research professor	21, 39
Dissertation doctorate	26, 39	Liaison Office	4, 9, 32	Specified contributions	10, 12, 33, 36
Doctoral program	7, 9, 11, 24, 26-28, 30, 39	Licensing	3, 4, 41, 42	Subsidies	12, 14, 31, 33, 36
Doctorates, number awarded	24, 39	Master course	9	Technical guidance	7, 33, 36
Expenses, general administrative	35, 36	MEXT Grants-in-Aid for Scientific Research (Kakenhi)	3, 12, 17, 31, 37	Technology transfer	2-4, 13, 41, 42
Expenses, indirect	35, 36, 38	MEXT Special Coordination Funds for Promotion of Science and Technology	19, 33, 37, 38	Z1st Century COE Program	2-5, 12, 14, 23-31, 33
External (research) funds	3, 12, 13, 21, 33, 35, 39	Organization for Research Advancement and Administration (ORAA)		Venture	3, 4, 13, 14, 16, 18, 41, 42
Frontier Research and Education Collaborative Square (K-FRECS)			2-4, 24, 46		
	3, 4, 15, 21, 17, 32	Office of Research Administration	3, 9, 11, 13, 32, 34, 46		
Global COE	2, 17, 24, 27, 28	Patent applications	3, 41		
Grants, Research grants	3, 9, 10, 12, 14, 17, 21, 33, 36				
Incubation, Incubation Center	3, 4, 13, 14, 22, 24, 32, 46				

Access Information

Mita Campus

2-15-45 Mita, Minato-ku, Tokyo 108-8345
Tel +81-3-3453-4511

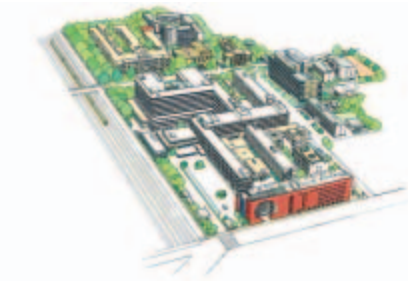
- 8-minute walk from Tamachi St. (JR Yamanote Line or JR Keihin Tohoku Line); Approximately 10 minutes by train from Tokyo to Tamachi.
Approximately 20 minutes by train from Ueno to Tamachi.
Approximately 15 minutes by train from Shibuya to Tamachi.
- 7-minute walk from Mita St. (Asakusa or Mita Line); Approximately 15 minutes by train from Suidobashi to Mita.
- 8-minute walk from Akabanebashi St. (Oedo Line)



Shinanomachi Campus

35 Shinanomachi, Shinjuku-ku, Tokyo 160-8582
Tel +81-3-3353-1211

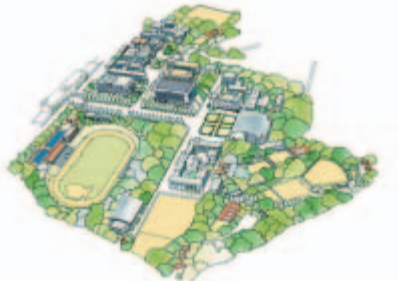
- 1-minute walk from Shinanomachi St. (JR Sobu Line); Approximately 6 minutes by train from Shinjuku to Shinanomachi.
Approximately 25 minutes by train from Tokyo to Shinanomachi.
- 5-minute walk from Kokuritsu-kyogijo St. (Oedo Line)



Hiyoshi Campus

4-1-1 Hiyoshi, Kohoku-ku, Yokohama-shi, Kanagawa 223-8521
Tel +81-45-563-1111

- 1-minute walk from Hiyoshi St. (Tokyu Toyoko Line); Approximately 25 minutes by train from Shibuya to Hiyoshi (20 minutes by express).
Approximately 20 minutes by train from Yokohama to Hiyoshi (15 minutes by express).
Approximately 20 minutes by train from Shin-Yokohama to Hiyoshi via Kikuna.



Shonan Fujisawa Campus

5322 Endo, Fujisawa-shi, Kanagawa 252-8520
Tel +81-466-47-5111

- Approximately 15 minutes by bus from Shonandai St. (Odakyu Enoshima Line, Sagami Tetsudo Izumino Line, or Yokohama Subway Line);
Approximately 30 minutes by train from Yokohama to Shonandai.
- Approximately 25 minutes by bus from Tsujido St. (JR Tokaido Line);
Approximately 30 minutes by train from Yokohama to Tsujido.



Yagami Campus

3-14-1 Hiyoshi, Kohoku-ku, Yokohama-shi, Kanagawa 223-8522
Tel +81-45-563-1141

- 15-minute walk from Hiyoshi St. (Tokyu Toyoko Line); Approximately 25 minutes by train from Shibuya to Hiyoshi (20 minutes by express).
Approximately 20 minutes by train from Yokohama to Hiyoshi (15 minutes by express).
Approximately 20 minutes by train from Shin-Yokohama to Hiyoshi via Kikuna.
- Approximately 10 minutes by car from Shin-Kawasaki St. (JR Yokosuka Line);
Approximately 20 minutes by train from Tokyo to Shin-Kawasaki
Approximately 12 minutes by train from Shinagawa to Shin-Kawasaki.
Approximately 9 minutes by train from Yokohama to Shin-Kawasaki.



Shin-Kawasaki Town Campus

144-8 Ogura, Saiwai-ku, Kawasaki-shi, Kanagawa 212-0054
TEL +81-44-580-1580

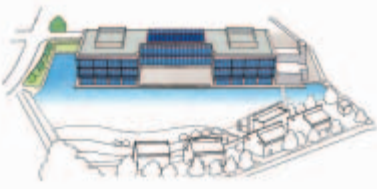
- 10-minute walk from Shin-Kawasaki St. (JR Yokosuka Line);
Approximately 20 minutes by train from Tokyo to Shin-Kawasaki.
Approximately 12 minutes by train from Shinagawa to Shin-Kawasaki.
Approximately 9 minutes by train from Yokohama to Shin-Kawasaki.
- 15-minute walk from Kashimada St. (JR Nambu Line);
Approximately 7 minutes by train from Kawasaki to Kashimada.



Tsuruoka Town Campus

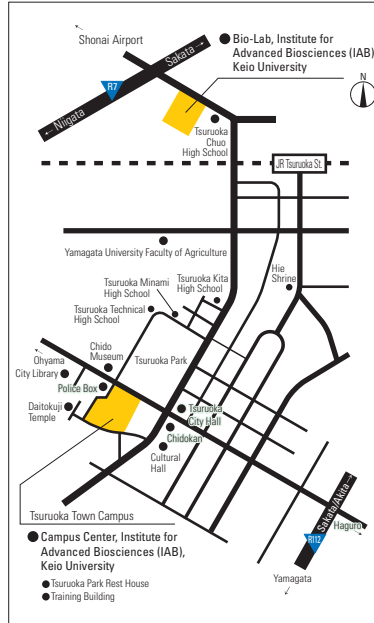
Center Building

14-1 Baba-cho, Tsuruoka-shi, Yamagata 997-0035
TEL +81-235-29-0800



Bio-lab

403-1 Nipponkoku, Daihouji, Tsuruoka-shi, Yamagata 997-0017
TEL +81-235-29-0534



- By air: approximately 60 minutes from Tokyo Haneda Airport to Shonai Airport, approximately 25 and 18 minutes by car from Shonai Airport to Center Building and Bio-lab, respectively.
- By train: approximately 120 minutes by Joetsu Shinkansen (bullet train) from Tokyo St. to Niigata St., then approximately 120 minutes by Uetsu Honsen (main line) from Niigata St. to Tsuruoka St., then 5 minutes by car.



Contact Information

Mita Campus

- CRP: Center for Research Promotion
crp@info.keio.ac.jp
- IPC: Intellectual Property Center
toiawasesaki-ipc@adst.keio.ac.jp
- Head Office of Research Administration
ora-honbu@adst.keio.ac.jp
- Office of Research Administration, Mita Campus
mshien-ft@adst.keio.ac.jp
- ORAA: Organization for Research Advancement and Administration
oraa-jimukyoku@adst.keio.ac.jp
- Incubation Center
incu-jimu@adst.keio.ac.jp
- KARC: Keio Advanced Research Centers
karc-jimu@adst.keio.ac.jp

Hiyoshi Campus

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ras-hiyoshi@adst.keio.ac.jp

Yagami Campus

- Office of Research Administration, Yagami Campus
yg-shien@adst.keio.ac.jp

Shinanomachi Campus

- Office of Research Administration, Shinanomachi Campus
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Shonan Fujisawa Campus

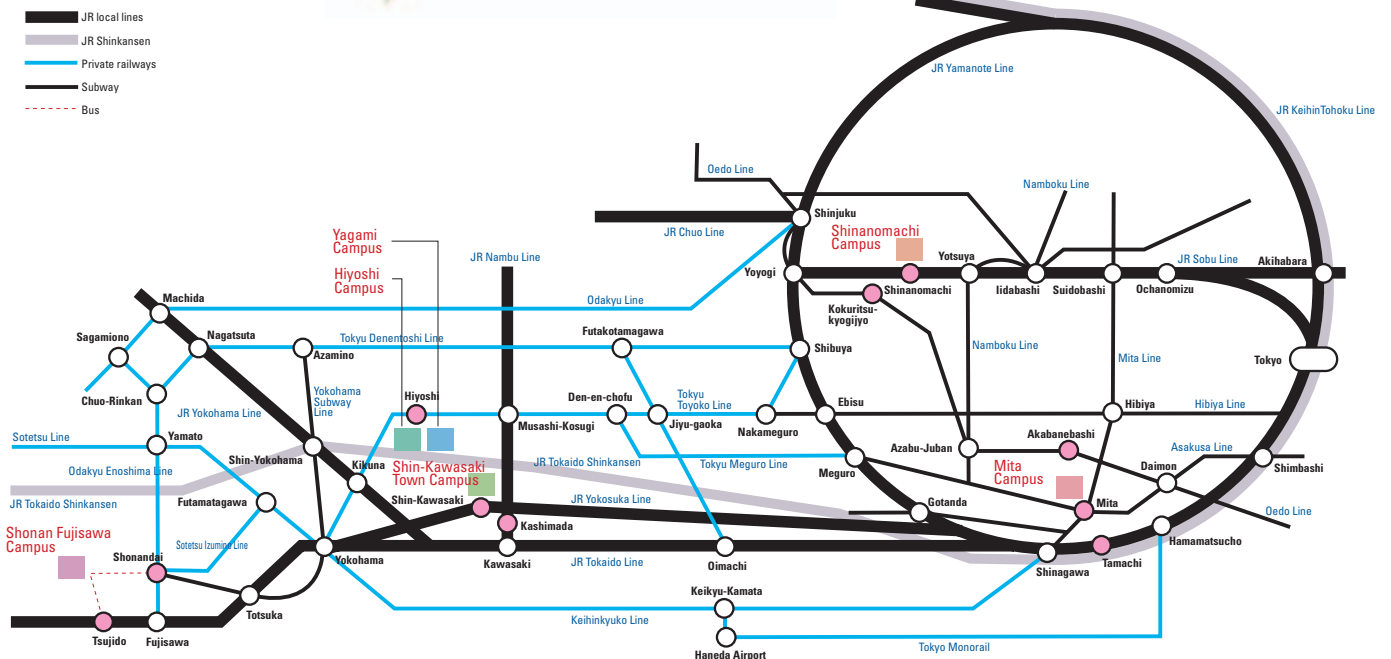
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